



# Introduction to Computer Skills

## For first year students

### Bisha University

Preparation of elite faculty members  
Faculty of Computing and Information Technology









جامعة بيشة  
UNIVERSITY OF BISHA



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	Name	Specialization	
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3		Artificial intelligence	
4		Information Security	
5		information technology	
6		information technology	
7		Computer Engineering	
8		Multimedia	



## *Preface*

Praise be to Allah, Lord of the worlds, and prayers and peace be upon the Seal of the Prophets and Messengers, our master Muhammad, and upon his family and companions as a whole.

There is no doubt that the computer in its various forms has almost invaded our lives, and its use has entered various fields of life. Indeed, illiteracy today is known as the inability to use the computer. Today, we cannot find an excuse for a person who cannot deal with the computer, so what do we think about the university students!

Thus, we had to put in the hands of our students this book on computer skills, which we tried hard to collect the most important basic skills that a student should know, starting from: computer components, software, operating systems, how to represent data inside; and even text editing, presentations preparation skills, creating spreadsheets; as well as how it is connected to networks and the Internet, how to search, communicate using its electronic means; learn about e-learning methods; and protect data, etc.

In this book, we have considered many things that make the book easier for the student to make the best use of it, including: separating theoretical and practical parts, mentioning the skills to be learned before each part, simplifying the information without failing a disruptive or boring verbiage, enumerating the steps to be followed in learning a skill, and enriching the book with graphics, illustrations and comparison tables, etc.

At last, we hope that our dear students would benefit from the book and achieve their goals of learning more about the various computer skills. We, also admit that perfection is God alone, so what was shortened is from us and from Satan, and what was reconciled is from God Almighty. We welcome any constructive criticism, adding value, correcting a bug, or a helpful suggestion. We are always happy to receive your comments and suggestions on the following e-mail: [CSkillsbook@gmail.com](mailto:CSkillsbook@gmail.com)

**May Allah grants us success,,,**

**Authors of the book**



### *Book chapters*

This book is arranged and organized in seven theoretical chapters, and other seven chapters concerned with practical practical aspects, which are as follows:

<b>Chapter 1</b> Introduction to computers	The first chapter talks about the definition of the computer and its main characteristics. It also presents a comparison between the computer and the human being, gives an idea of the most important stages of computer development, as well as explains the types of computers according to multiple criteria.
<b>Chapter 2</b> Hardware	The second chapter deals with the definition of the computer hardware, the input units, the output units, the central processing unit, the storage units (memory), the motherboard, the ports and cards on the computer, and how to measure the performance of computers and numerical systems. The chapter concludes with the representation of data inside the computer.
<b>Chapter 3</b> Software	The third chapter deals with the definition of computer software, the most important types of software, what are system software, programming languages, and application software and examples thereof.
<b>Chapter 4</b> Computer networks and the Internet	Chapter Four presents an introduction to networks, the importance of networks, the types of networks and components required to make a local network, the stages of Internet development, the difference between the Internet and the web, types of sites, Internet features, types of Internet connections, types of servers, search tools, types of protocols, and methods of searching the Internet
<b>Chapter 5</b> E-learning	The fifth chapter deals with the definition of e-learning and its components, the goals of e-learning and its types, what are the means of e-learning, how to use e-learning in teaching at Bisha University, e-learning management systems and e-learning management system (Blackboard) and the most important e-learning platforms.

<p><b>Chapter 6</b> Computer viruses</p>	<p>Chapter Six talks about an introduction to computer viruses, the types of risks that threaten a computer and data, how to protect data, mechanisms for working viruses, classification of viruses, methods of virus transmission, symptoms of infection, most common viruses, antivirus programs, and computer ethics.</p>
<p><b>Chapter 7</b> E-commerce</p>	<p>Chapter Seven deals with an introduction to e-commerce, its definition, what are the advantages of e-commerce, the many areas in which it is used, the payment and payment systems used in e-commerce and the supporting infrastructure.</p>
<p><b>Chapter 8</b> Windows operating system</p>	<p>Chapter Eight talks about the requirements for installing Windows 10, desktop skills, dealing with the taskbar, dealing with folders and files, searching for files and folders in Windows 10, customizing Windows through the control panel, and adding or removing applications or programs.</p>
<p><b>Chapter 9</b> The word processor Microsoft Word</p>	<p>Chapter Nine deals with the introduction to Microsoft Word 2016 program and its features: open and close the program, learn about the components of the program interface, how to create documents, use templates, save and open documents, edit text, navigate, search, replace, cut, copy and paste, formatting operations, deal with ready patterns, manage documents, insert header and footer, insert and remove page numbers, insert images, graphics, tables, shapes, symbols, and equations.</p>
<p><b>Chapter 10</b> PowerPoint presentations software</p>	<p>Chapter ten addresses an introduction to the presentation software and the basics of design using PowerPoint; opening and closing the PowerPoint 2016 software and interacting with PowerPoint through the use of templates, the main user interface (window), the Home tab, the Insert tab, the Layout tab, the Actions tab, and the Slideshow tab.</p>
<p><b>Chapter 11</b> Excel spreadsheet software</p>	<p>Chapter eleven talks about an introduction to the electronic spreadsheet software and design features using Excel, create, open and close the program, as well as explains the main user interface components of the electronic spreadsheet program Excel, how to change the direction of the paper in the electronic spreadsheet program Excel, ways to delete cells and rows and columns and papers, how to enter data into cells and amend on cell content, search and replace, transition to specific cells, ascending or descending cell sorting methods, freezing panels, applying mathematical functions, coordinating cells, inserting objects, inserting images, inserting shapes, and dealing with charts.</p>

<b>Chapter 12</b> Electronic means of communication	Chapter 12 gives a comprehensive understanding of how the Internet works, web browsing, the role of Microsoft Edge browser, understanding Internet addresses, the role of Internet search engines, search engines, how the search engine works, examples of the most popular search engines, how to use Google to search, review search results, how to search in Google and Wikipedia researcher and create an account on Wikipedia and the Digital Library of Bisha University, and how to access them
<b>Chapter 13</b> Blackboard system	The thirteenth chapter talks about an introduction to the electronic learning management system “Blackboard”, the features of the electronic learning management system “blackboard”, the main screen of the “blackboard system”, how to change the personal settings and the main language of the system, what are the modules and facade of the curriculum, assignments, electronic tests, the role of virtual classes (Virtual Classrooms), and how to save and retrieve sessions.
<b>Chapter 14</b> Blackboard system	Chapter Fourteen gives an introduction to electronic communication, ways to access university email, creating a new email, dealing with incoming email messages, sharing files through Google Drive and YouTube (YouTube), the YouTube search interface, search filtering methods, watching and interacting with clips, and restricting content, educational channels in YouTube, how to get an account on YouTube, use the basic activities in YouTube, and create a channel on YouTube.



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# Theoretical Part





# Chapter 1

## Introduction to Computer







## Introduction to Computer

### Objectives

#### ➔ Main objectives:

1. To learn about computer and its characteristics and features.
2. History of computer and its different generations.
3. Comparing different types of computers.

#### ➔ Secondary objectives

After studying this chapter, the student is expected to master the following knowledge and skills:

1. To know what is the computer.
2. To distinguish different computer properties.
3. To list the computer's features and capabilities.
4. To compare the computer's capabilities to humans.
5. To learn about the different uses of the computer.
6. To distinguish different stages and generations of computers.
7. To list the distinctive characteristics of each generation.
8. To compare between the different types of computers.



## 1 - 1 Introduction to computers

Computer is the most used device today, whether at homes, schools, universities, or research institutions, as well as in companies, bodies, factories, and various workplaces. Computer is also used to facilitate human work and to help in implementing many functions and tasks with high efficiency and without boredom. Moreover, it has affected the development of all sciences and knowledge, and added more discoveries. Currently, all developed machines and devices have become more connected to computer, as they are working in coordination with it and under its control. Computer has also become a reliable repository for storing files, instead of papers and books. That saved a lot of time and effort as well as speed in retrieving data, information, and directly reaching the required results.

**Skill 1 - 1**  
Defining of computer and determining its main characteristics.



## 1- 2 Definition of computer

There is no specific and agreed definition for the computer, but there are many definitions that explain how a computer works and express its main characteristics. We can agree in defining the computer as:

“An electronic device that receives data (inputs) and processes it by performing a set of operations (mathematical and logical) at high speed and infinitely accurate along with the ability to store huge amounts of data and information and retrieve them (outputs) when needed according to specific conditions”.

The data passes through several stages inside the computer, from entering it using the input units to its exit through the output units. Figure 11- shows the different stages through which data passes through the computer.

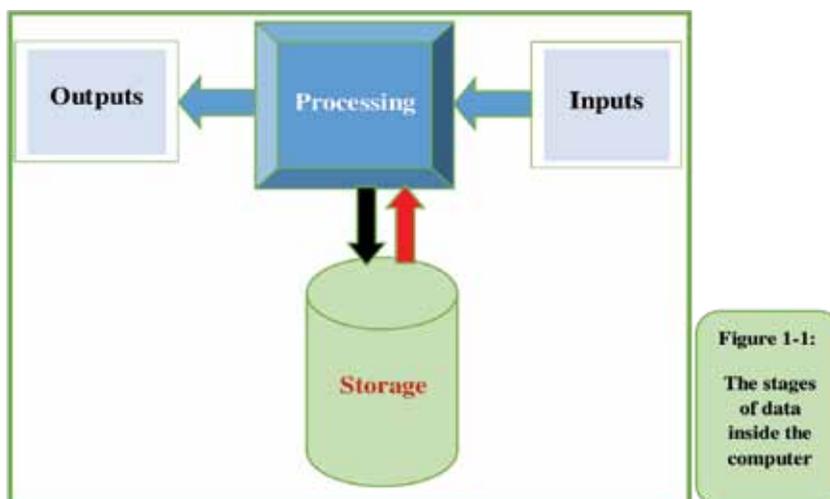


Figure 1-1:  
The stages  
of data  
inside the  
computer

### 1- 3 Computer Characteristics

*The computer is characterized by the following features:*

- It consists of many parts connected to each other, which work as one unit.
- Depends on receiving inputs (data) through special devices (input units).
- It processes data using special instructions (computer software), which directs it to implement the required operations (mathematical and logical operations).
- Displays information resulting from processing operations using multiple methods and by special devices (output units).
- Stores massive amounts of data and information with high-capacity storage media (volumes).
- It can communicate with other devices to form a network of computers, which allows the sharing of data, programs, information and various resources (computer networks).

### 1 -4 Comparison between computers and humans

There are many aspects that the computer has proven its ability to do better than humans, and these are:

#### **1. Performing mathematical operations**

The computer can perform millions of mathematical operations, and solve complex equations with great accuracy and super speed measured in parts of a second, and it is not compared to the limited human capabilities in this field because of its errors, omissions or boredom.

#### **2. Data storage**

The computer has proven its superior ability to store and process a huge amount of data in a way that made one almost completely dependent on it for storing important data and information as an alternative to the traditional measures previously used such as paper records; examples include preserving employee data in a company, citizens in a country, or subscribers to a telecommunications company, etc.

#### **3. Retrieve information**

The importance of data storage appears in the computer's ability to retrieve information very quickly and under specific conditions that the user sets for the retrieval process. The computer can search huge amounts of data to retrieve specific information to which the search terms apply. In addition

to the enormous speed of the computer, the search may not take parts of a second. For example, the search for data of a subscriber in the Communications Authority using the phone number as a search condition. Here, the computer searches for the data of this person among millions of subscribers, and the result of the search is the private record (data set) for this subscriber only.

#### **4. Accurate repetition**

One of the most important things that distinguishes a computer from a person is its ability to perform certain operations repeatedly for hundreds and possibly millions of times without getting bored or error. For example, a computer can print hundreds of copies of the same paper without getting bored or having errors between the first edition and the last edition. Also in auto factories, the robot (robotic arm) is used efficiently to assemble cars, which is a boring, routine mechanical process that involves many operations that collect hundreds of cars in the same way daily.

In spite of all the previous features of the computer, the human being has always been and will always be superior to the computer because of the mental and sensory capabilities God has bestowed on him and the computer cannot approach it, because at the end it is just a human-made machine with limited capabilities. Among the advantages of the human being that distinguish it from the computer:

1. The ability to think freely.
2. The ability to solve problems and judge events with experimental experience, which helps a person make a decision about what to do in the future.
3. Creativity and innovation, as it is the human being who invented and developed the computer continuously.
4. The ability for continuous self-learning.
5. Movement and flexibility compared to limited robotic capabilities.

### **Skill 1 - 2** **Human-computer comparison.**



Table 1- 1 summarizes the main differences between human capabilities and the computer.

Table 1- 1 The difference between a person and a computer

comparison points	Human	Computer
speed	His speed is medium or slow.	Its speed is enormous.
Accuracey	Makesmistakes and subject to oversight.	It is very accurate.
Exposure to danger	His life cannot be risked to face bad conditions like nuclear radiation.	Easy to endanger.
Affected by external conditions	Is influenced by emotion and external influences.	It performs its tasks automatically and is not affected by external conditions.
Mental capacities	Is characterized by reason and creativity.	It does not think, but he executes tirelessly.
Running cost	The cost of hiring expert human beings is expensive.	The cost of using the computer is low.
Storage capacity	Human has limited memory and data storage.	It has an enormous capacity to store large amounts of information and data.

**Skill 1 - 3**

Distinguishing between different stages and generations of computers.



**1- 5 Stages of computer development**

**1- 5- 1 The first stage: the early historical stage**

In this stage, attempts to develop machines that help in performing mathematical operations in an easier way. These attempts started since the year 2000 BC, which witnessed the emergence of the first machine to help dealing with numbers. It was considered an easy manual method for counting and calculation, which is the Abacus counter (as in Figure 1- 2) developed by the Chinese. This counter is still being used to develop children’s math skills.

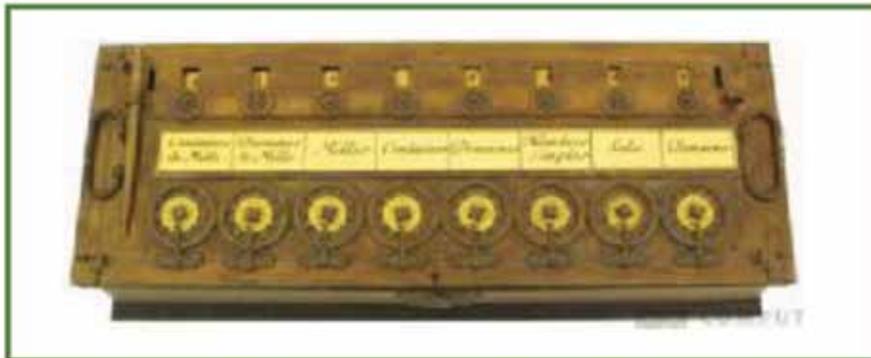


**Figure 1-2:**  
**Counting machine (counter) (Abacus)**

Also spread in the beginnings of the twelfth century AD the use of Indian and Arabic counting systems, which was characterized by its emphasis on the value of each number according to its location within the number (weight of the number). The Arab counting system was distinguished by the presence of zero, unlike the Roman counting system, which did not contain zero.

### **12-5- The second stage: the emergence of mechanical and electromechanical computers**

**1643AD:**The invention of a semi-automatic mechanical calculating machine by the French scientist Blaise Pascal to use for adding and subtracting numbers. This machine consisted of 8 metal disks where decimal numbers were engraved on the perimeter of each of them at regular distances. The disks could be managed and rotated to perform addition and subtraction operations. Figure 1 -3 shows a model of this machine.



**Figure 1-3**  
**Pascal computing machine**

**1693AD:** Development of Pascal computing machine and making several improvements and additions by the scientist Libbies to be able to perform multiplication operations(Figure 1- 4).



Figure 1-4:

The  
upgraded  
version of  
Pascal  
Machine 1

**1805AD:** The French scientist Joseph Marie Jacquard invented weaving machines programmed through a successive set of punched cards used as a program for automatic patterned silk weaving (Figure 1- 5).

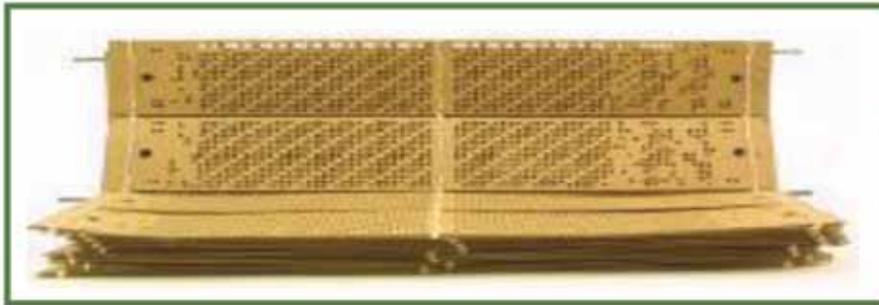


Figure 1-5:

Perforated  
cards

**1830AD:** English scientist Charles Babbage invented a mechanical calculator (Figure 1- 6) that was able to perform mathematical operations and some other operation such as logarithms, and trigonometric percentages of angles. Babbage is considered the real father of the modern computer. He is the first to invent the idea of the stored program and divide his computer into functional units similar to the idea of partition used in modern computers.



:Figure 1-6

Babbage's  
mechanical  
calculator

**1887AD:** American scientist Hermann Hollerith made a punching machine and tabulation machine, which was used to make a census of the population in the United States of America.

**1890AD:** A company was established to produce tabulation machines, and this company expanded and later joined with other companies, which led to the emergence of the famous (IBM) company.

**1944AD:** Aiken and Grace Hopper, with assistance and support from IBM, were able to develop and produce the first computer (an electromechanical calculator) called Mark-1 (Figure 1 -7)

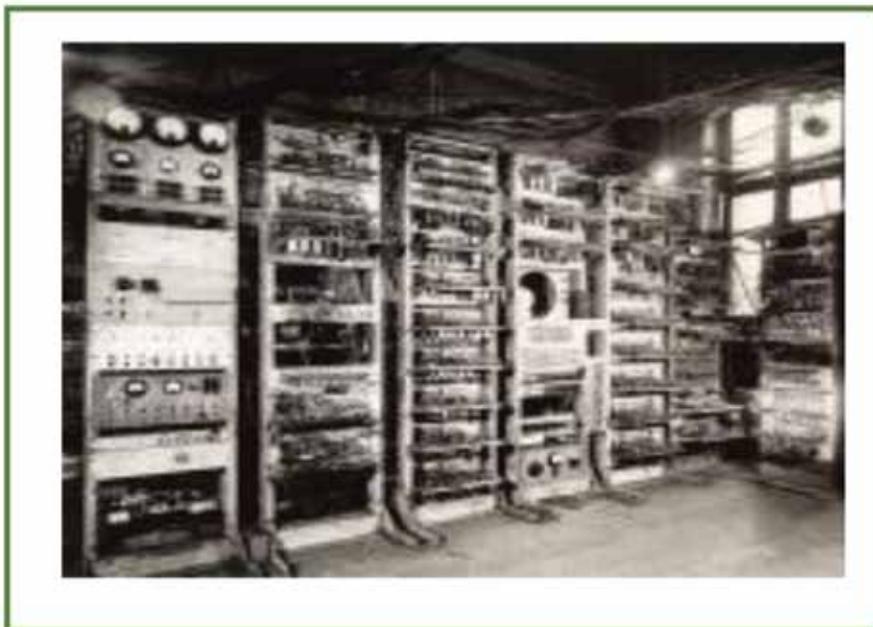


Figure 1-7:

The first  
electromec  
hanical  
calculator

Mark-1

### 13-5- The third stage: modern computer generations

The development of the computer has passed, since its appearance and till now, in many stages and generations, which express the continuous development and progress in the design of the device and its various accessories. The computers that have emerged since the late 1940's and to our days could be divided into generation groups. Each group possesses common characteristics. Such that, it was manufactured of the same technological basis, and has also appeared within specific time periods. Modern computer development can be divided into five generations:

#### **First: the first generation (1945 - 1958) - vacuum tubes**

The design of this generation's calculators is based on the use of vacuum tubes (Figure 1-8). These tubes used a lot of electric energy and resulted in high temperatures, and thus required continuous cooling operations. The size of these computers was very large, and the cost is high, in addition to being heavy in weight. The first computers of this generation were the computer called ENIAC, then the computer appeared EDVAC, followed by the computer EDSAC and finally the computer called UNIVAC.



:Figure 1-8

Vacuum  
valves -  
computer  
INIAC

#### **First-generation computer features**

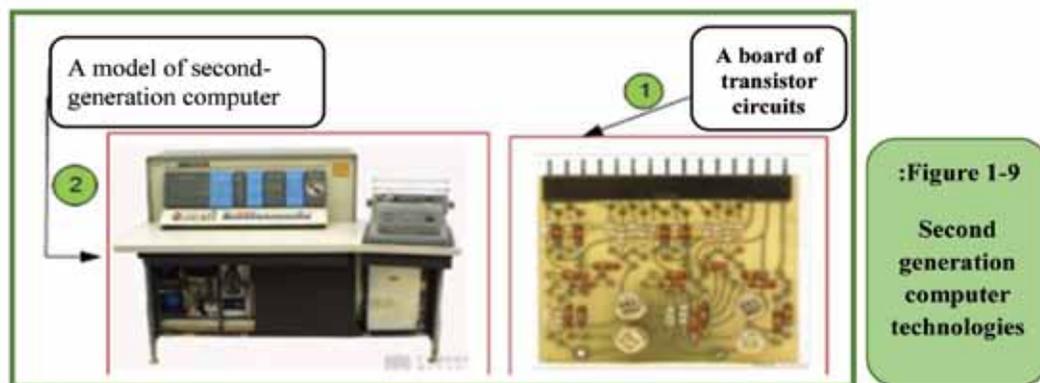
- The use of vacuum tube technology in design and construction.
- The size of these computers was very large and weighed heavily.
- It consumes large quantities of electricity and generates large amount of heat.
- It performs operations with a slow speed (1020- thousand operations per

second).

- It used machine language (based on binary system 0 and 1) in writing programs, and therefore the programs were very complex.
- Magnetic cylinders were used as a means of entering data into the computer, and rudimentary printing machines to get results.

### ***Second: the second generation (1959 - 1964) - the transistor***

In this generation, the transistor technology was used as a substitute for vacuum tubes which were smaller and longer in life and did not consume high electrical energy. This helped produce faster and smaller computers (Figure 1 -9). External storage media was used as a secondary memory, too. This was the beginning period for appearance of some high-level programming languages.



### ***Second-generation computer features***

- The use of transistor technology in design and construction.
- The size of these computers is smaller than the first generation.
- It executes operations at high speed (hundreds of thousands of operations per second).
- Use of magnetic tapes and magnetic disks as a secondary memory.
- The emergence of some high-level programming languages, such as Fortran and Cobol.

### ***Third: The third generation (1964 - 1970) - Integrated circuits***

In this generation, the integrated circuit technology made of silicon wafers was used in the manufacture of computers. Accordingly, it has become much smaller than its predecessors, with a huge increase in speed, which is now measured by the number of operations per nanosecond. Memory capacity increased further. Medium computers that share a group of terminals with one large and central computer, also appeared, Figure 1- 10, showing samples of computers from that generation.

**Third-generation computer features**

- The use of integrated circuit technology in design and construction.
- It is much smaller than its predecessor and has a lower production cost.
- It increased its speed a lot and became measured with nanoseconds.
- Fast input and output devices as well as color screens appeared.
- Increase the main memory capacity. It reached 8 million bytes on some devices.
- The emergence of some high-level programming languages, such as "PL / 1", "Algol68" and "Lisp".

**Figure 1-10:****Models of  
the third  
generation  
computers****Fourth: The fourth generation (1970 - 1995) - microprocessors**

In this generation, the microprocessor appeared, which represented a major revolution in the world of computer design. As processor-building technologies evolved and their speed increased tremendously, the production of much smaller, faster and cheaper computers becomes available.

Figure 1- 11 shows examples of a group of computers that appeared in this generation that are smaller than previous generations.



**Figure 1-11:**

**Models of  
fourth  
generation  
computers**

### ***Fourth-generation computer features***

- The emergence of very small processor technology.
- Computers were characterized by small size and low cost.
- Significant increase in speed, reaching hundreds of millions of operations per second.
- Read Only Memory (ROM) and Random Access Memory (RAM) appeared.
- Operating systems have evolved a lot and personal computers have emerged.
- Use floppy disks and hard disk to store data.
- The beginning of the emergence of computer networks.
- The emergence of many high-level programming languages, such as C, Pascal, C++ and Prolog.

### ***Fifth: The fifth generation (1995-until now) - portable smart devices***

The fifth generation is the current and continuous generation until now. The computers of this generation provide a significant increase in productivity, as multi-core processors appeared, and computer speeds increased to very high capabilities. This generation is also considered the basis for the communications era and the communication revolution, as the Internet has emerged and communications have increased significantly. Personal computers, laptops, handsets, and other related devices have also spread, as shown in Figure 1- 12.



Figure 1-12

Models of  
fifth  
generation  
computers

### ***Fifth generation computers features***

- The emergence of multi-core processors, which led to a huge increase in speed.
- Increased storage capacity, and the emergence of new storage media such as CDs and Flash memory.
- The development of visual operating systems, such as the Windows operating system, and the emergence of visual programming languages that have facilitated the design and programming of applications such as Visual Basic and others.
- The development in the field of networks and the emergence of the Internet.
- The advent of artificial intelligence and the development of robotic technologies.

### **Skill 1 - 4**

Distinguish between different types of computers.



### **1 -6 types of computers**

Computers can be divided in many ways, depending on the standard seen when partitioning, and there are many criteria, as shown in Figure 1- 13.

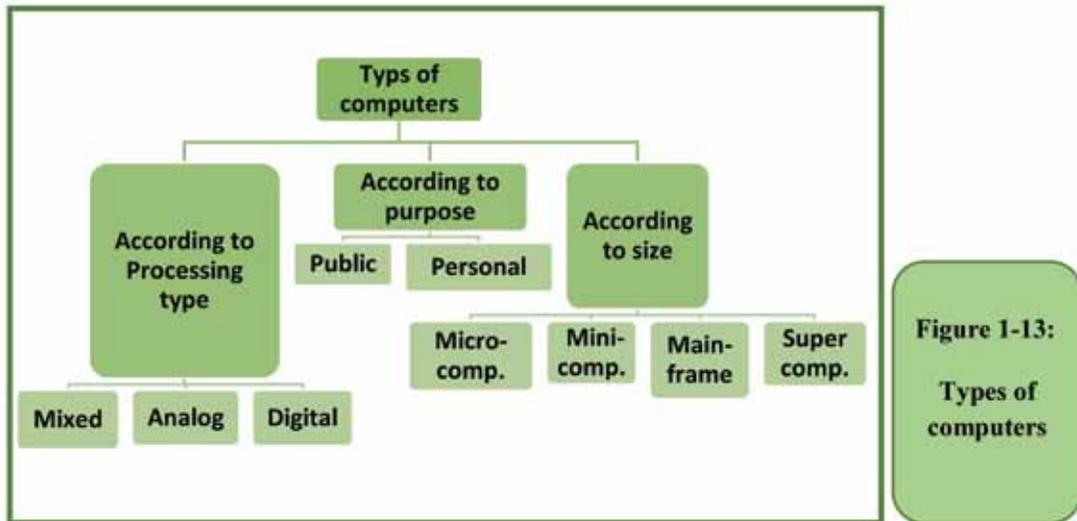


Figure 1-13:  
Types of computers

### **1 -6- 1 Types of computers by size**

Computers have evolved over time and their sizes have changed from giant and super-power to lesser sizes with a significant increase in capabilities. The division by size includes the following types:

#### **First: Supercomputers**

It is the largest computers, with special capabilities in either processing operations or storage capacity, and it is considered a highly advanced technology. Until recently, it was the preserve of the major countries only due to its huge potential. These computers are used in research centers such as the NASA Space Center, the US Department of Defense, and others, as well as in dangerous experiments such as nuclear tests. It is worth noting that the Kingdom of Saudi Arabia has succeeded in achieving a world record through the computer “Shaheen 2” which is located at King Abdullah University of Science and Technology (Figure 1- 14), And who reserved his place on the list of supercomputers for the ten most powerful devices in the world, and is considered the first in the Middle East. Shaheen II is currently used in modeling research projects for engines, atmospheric dynamics, and renewable energy networks.



Figure 1-14:

Super  
Computer  
Shaheen

### **The characteristics of Supercomputers**

- It has hundreds of thousands of processors working together (up to more than 100,000 processors).
- Super computers are measured with a scale called FLOPS and its multiples.
- It may speed more than 1000 trillion operations per second.
- It consumes very large amounts of electricity.
- It needs special cooling systems that result in huge temperatures.
- The cost of operating and cooling the system is very large (the cost of operating one device may exceed \$ 4 million annually).
- Most modern supercomputers use the Linux operating system or modified versions of it specifically to suit the capabilities of the device.
- Uses special and unconventional software technologies to exploit super-computer speeds (running thousands of processors at the same time).
- The supercomputer weighs hundreds of tons and occupies a very large space.
- Pure gold or diamonds may go into the design of supercomputers.

### **Second: Mainframe computer**

Also known as central computers, this type of computer has been designed to serve the purposes of large corporations such as banks, factories, airlines, ministries, and major government agencies (Figure 1 -15). This type of computer is distinguished by its huge ability and high speed in processing a huge amount of data flowing to it from other devices where it can deal with information very quickly, which makes it suitable to connect a network of computers on a large

scale, and it may be at the level of an entire city, large company, country or A continent or even the entire world.



**Figure 1-15:**  
**Mainframe**  
**computer**  
**models**

### ***The characteristics of Mainframe***

- It can run more than one operating system on the same device.
- It can operate more than one virtual machine, which is known as virtual machines.
- One large computer can substitute for hundreds of servers.
- It is used in giant institutions such as banks, airlines and others.
- It can serve thousands of users at the same time.
- Has huge processing capabilities and high speeds.
- Serves a wide range of computers (company branches - city - whole continent).

### ***Third: Minicomputers***

The average computer is smaller than the previous computers, and this computer is often used in companies and government institutions that deal with a large number of customers in order to accomplish their administrative or other transactions, such as postal centers, social security and major commercial centers (Figure 1 -16).

### ***The characteristics of Minicomputer***

- Medium in size and smaller than the previous ones.
- Usually used as a service provider (server) for networks and the Internet.
- Designed to allow it to process multiple requests from different destinations.
- Adopts the Central Memory Unit, which is the subscription of several clientcomputers in one central system unit.

- Any user can access the database stored on the central unit.
- It is used in major companies and government institutions to serve a large number of users.
- Any user can use the various sharable resources associated with this central unit (such as a printer, scanner, etc.).



Figure 1-16:

Medium  
computer  
images

### ***Forth: Microcomputers***

It is the smallest in terms of size among other forms of previous computers, and the least in terms of processing and storage capabilities. They are usually equipped with one or more microprocessors to increase their operating capacity. This type of device is sometimes called a Microcomputer. These computers are divided into:

#### ***1. Desktop***

They are computers that are used to facilitate the implementation of work (for individuals and institutions), as they are suitable for placing them on an office in the home or work. These computers have evolved and become highly capable and fast, and we cannot make this type portable as it is relatively large in size.

Figure 1 -17 shows some examples of modern desktop computers.



**Figure 1-17:**  
Some models of desktop computers

### 2. Portable computers

They are small-sized computers (a few centimeters in height and width, and a few centimeters in length, see Figure 1- 18). These computers are usually used during travel because of the ease of transport and the integration of the display and keyboard on one unit, and it works with rechargeable batteries for use while moving. It is also considered a portable computer due to its light weight and being a single piece. It has been designed to perform all the functions of a desktop computer, which means that it can be used to run the same programs and deal with the same types of files.



**Figure 1-18:**  
Some laptop models

### 3. Personal Digital Assistant (PDA)

It is a small-sized computer equipped with a special pen instead of the traditional keyboard, but some of the more expensive devices have a keyboard, and the pen is used to store and recall information. Also, it has many capabilities similar to all other personal computers and is equipped with a battery that is charged to work for long hours, and is considered more expensive than the laptop because of its small size, ease of use. It is suitable for running many applications. It can also be connected to the Internet and is usually used by businessmen and sales representatives to save important addresses and appointments as well as to present their presentations.

Figure 1 -19 shows models of some PDAs.



Figure 1-19:

Personal  
digital  
assistant  
models

#### 4. Tablets

It is a small portable computer (tablet) that works through the touch screen (the screen size usually ranges between 7 and 10 inches) and does not have a traditional keyboard. Its internal storage capacity varies between 16 and 128 GB and still increases by the time, an external memory can be added to raise its efficiency as well. It is characterized by lightweight, small size, ability to connect to the Internet either through mobile networks or Wi-Fi, providing visual effects to change the size of screens when browsing the Internet and switching between programs and applications. Figure 1- 20 shows examples of some Tablets.



Figure 1-20:

Various  
models of  
Tablets

#### **The characteristics of Microcomputer**

- Small in size and light in weight.
- Equipped with one or more microprocessors to increase its operating capacity.

- It is called the Microcomputer.
- It performs the same tasks as large computers, but slowly and with less information.
- It is characterized by its ability to process various types of data quickly and sufficiently to perform the various functions related to the business of individuals or institutions.
- Designed to perform various traditional computer functions such as writing, printing, browsing the Internet and designing images in addition to professional works such as montaging, writing programs, and others.
- There are many forms, including desktop, laptop, personal assistant, tablet, smart phone devices, etc.

### **1 -6- 2 Types of computers by type (processing method)**

Computers are divided by type or method of internal processing of the data that they process into:

#### ***First: Digital Computer***

They are the regular computers deployed in our daily life that perform operations by representing (converting) the data that they receive into a digital form. They represent all the inputs they receive (whether numerical, literal, sounds, etc.) into a digital form and then process these data according to the orders of a specific program. Thus, it depends on the numbers (the binary system) in implementing all of its operations. These computers are considered the most common and are used in all fields such as engineering, industrial, practical, commercial and social applications. All previous computers fall under this type.

#### ***Second: Analog Computer***

They are computers that operate with special values that can be received automatically as they depend on receiving analog data, which is a special type of non-digital data that can be measured as natural variables such as electrical voltage, current intensity or air pressure. These measurements are processed inside the computer and the results are stored as standard or continuing analog quantities. Examples of such computers include heart rate monitors such as those in hospitals and temperature and humidity measuring devices at meteorological stations, as shown in Figure 1- 21.

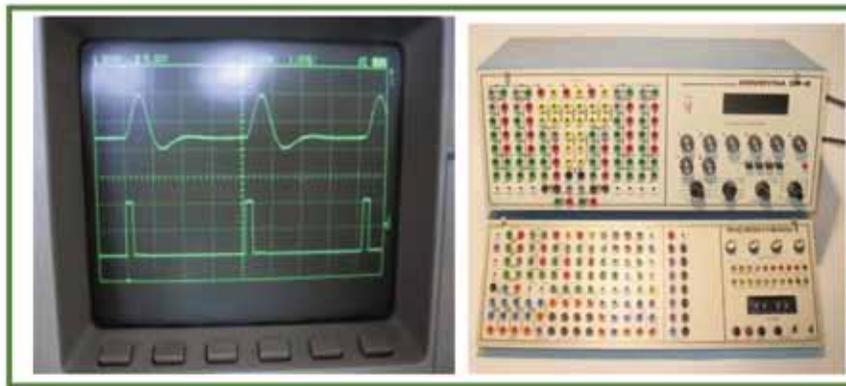


Figure 1-21:

Some  
analog  
computer  
models

### **Third: Hybrid Computer**

They are computers that combine the characteristics of the previous two types, analog and digital computers. They can automatically receive data in the form of measurements, similar to analog computers. They can also receive data in a separate entry form and run them in a numerical way, similar to digital computers, as shown in Figure 122-. These computers are used in advanced applications such as medicine and space.

### **1 -6 -3 Types of computers according to the purpose**

Computers can also be divided according to the purpose for which they can be used as follows:

#### **First: General Purpose Computers**

They are the most famous computers and are used by millions of users around the world that are used to run large and diverse groups of applications, whether industrial, scientific or commercial. These computers are used to run general applications such as text editing, design or performing calculations. Also, they can be used to run special applications such as students' data logging, store contents, customer records at banks, etc. The previously explained digital computers are general purpose computers.



Figure 1-22:

Some  
models of  
mixed  
computers

### ***Second: Special Purpose Computers***

It is designed to serve specific purposes where it can perform a range of functions such as tracking and controlling missile and satellite tracks. One of the most popular special purpose calculators is a gaming computer because it only contains game software. Other areas in which special purpose computers are used are:

1. Directing and piloting aircraft.
2. Monitoring air and maritime traffic.
3. Directing missiles and satellites.
4. Monitoring manufacturing processes.
5. Managing data communication networks.

### ***1 -6 -4 Types of computers according to the method of implementing the instructions***

#### ***First: computers with serial processing***

Normally, personal computers contain only one processor through which digital data is processed in a serial manner to solve different problems. The problem can be divided into a separate series of instructions and the implementation of these instructions in succession, one after another, on the same processor; and not more than one instruction is executed at a time.

#### ***Second: computers with parallel processing***

On computers with parallel processing, the matter is very different, as it depends on its design to use more than one processor to perform many tasks at the same time in a simultaneous way to solve a specific problem or implement specific instructions. This is done by dividing some instructions between more

than one processor and they are executed in parallel together and simultaneously.

The software that is designed for computers with parallel processing depends on dividing the work between several processors working simultaneously in order to increase the amount of work done and shorten the time required to carry out these operations. However, recently, with the development of techniques for designing and manufacturing processors, it became possible for a single processor to perform many operations at the same time in parallel through the multiplicity of the processor cores (Multicore Processors). The use of parallel technology in designing software or hardware helps in achieving the following advantages:

#### ***High speed:***

Parallel technology has been incorporated into the design of computers since the third generation. Supercomputers and mainframe use the concept of parallels on a large scale to increase speed and raise performance efficiency, which allows to increase the proportion of work and the number of users. The speed of computers has increased today to the extent that the speed of computer operations has reached huge limits that may reach the speed of light.

#### ***Reliability or reliability:***

The use of more hardware and processors increases the reliability of the device. For example, the spacecraft guidance system relies on the use of three devices from computers that compare their results with each other. The vehicle can only operate with one device while the other two are in standby mode.

#### ***Decentralization:***

The use of parallel technology makes control decentralized. Big companies can use a network of small computers in the headquarters and branches instead of using one large computer, which allows more control and control for the different branches.

### **1 -7 Types of computing**

#### ***First: distributed system***

Computing distributed from a group of computers that communicate with each other through a network connected to each other, where computers interact with one another in order to achieve a common goal. Computer programs that run on distributed systems are called distributed programs. In distributed computing, the problem is divided into small problems and then distributed to different computers to solve this problem. Distributed systems are characterized by many advantages, including:

- There is no common clock between devices, as each device has its own pulse and is independent of other devices.
- There is no shared memory, but information is exchanged by passing messages between different devices.
- Ability to withstand failure, as there are many other devices to compensate and perform tasks.
- Capacity for horizontal expansion of the system architecture (network size, number of devices increased).
- Each device or node sees a small part of the system, and deals with a specific part of the problem.

### ***Second: grid computing***

Grid computing is the distribution of tasks (such as data storage) and the operations required to be implemented on a number of different computers located anywhere, depending on the need, via the Internet. Network computing helps you through your personal computer, despite its modest specifications, to perform complex and advanced mathematical and scientific operations, such as areas of space research, financial and economic analyzes, earthquakes, and others. It enables a personal computer or more to use the capabilities of high and advanced specifications (Supercomputer). It is an application of the concept of distributed computing.

### ***Second: cloud computing***

Cloud computing is a package of computer hardware and software resources, for example: space to store data, backup and self-sync, operating programs, applications, email and others. It is available to customers through the use of the web browser without the need to be secreted and without attention to its physical location in order to facilitate the user . There are many benefits to cloud computing, including:

1. Save costs for the user as there is no need to purchase and maintain the computer resources required.
2. Easy to access and deal with stored data anytime, anywhere.
3. Dealing with many of the applications and services available on the cloud easily whatever your computer capabilities..

### ***Examples of cloud service:***

- E-mail services such as: Gmail and Yahoo mail
- Drop Box Cloud Storage services, such as Google Drive
- Cloud Application, among which the most famous: Google Docs and Photoshop express

- Cloud Operating Systems such as Windows Azure and Amazon Web Services
- Google scholar.
- Google Book Search.
- Google Lab Search service.
- Google Document service.

Among the most important global companies that contributed to the spread of cloud computing: Amazon, Google, and Microsoft (Microsoft). That was by providing many services to users and creating and managing many applications used that meet the need of those who want to use the cloud.

#### **Cloud computing requirements:**

1. A personal computer.
2. Connect to the Internet.
3. Internet browser.
4. Subscribe to the cloud computing service.

There are a number of free services that can be availed free of charge.

### **1 -8 Computer system components**

The computer system consists of a group of components or elements that work together in harmony and integration in order to achieve the optimal exploitation of the capabilities of the device and meet the needs of the user, as it appears in Figure 1- 23 and includes:

#### **First: Hardware**

They are the physical devices that are connected to each other to form a computer as we know it, and are divided into:

- Input units: used to enter data for the computer.
- Output units: used to output data and information to the user.
- System unit: The main component includes many internal components, the most important of which are the motherboard and central processing unit (processor), as well as memory units (RAM, ROM) and hard disk .. etc.

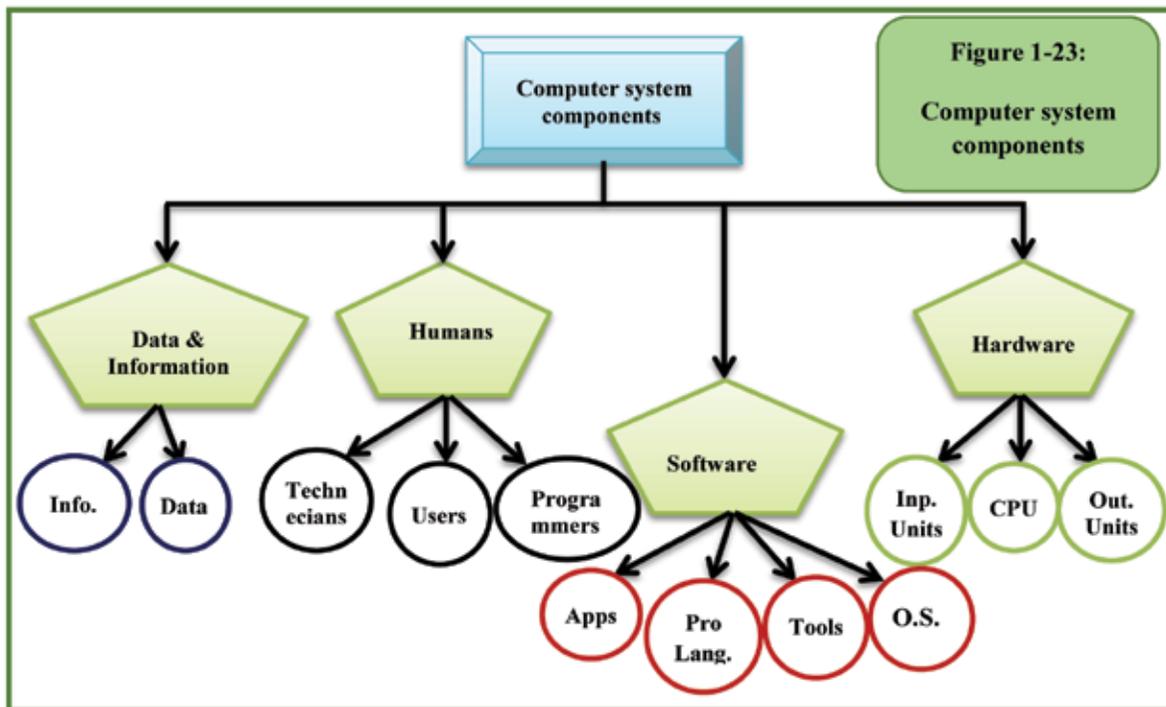


Figure 1-23:  
Computer system components

### **Second: Software**

It includes all software that are run by the computer and includes the operating systems used to operate the device and its management, programming languages that can be used in building other software, the various applications used in the implementation of functions and tasks and the supporting tools that are used to protect and improve the work of the computer.

### **Third: Humans**

They are the people who perform computer related work (programming and development - data entry and use of various programs - maintenance - ..etc). Also users: they are the people who deal with the computer and can be divided into three main sections:

#### **a) End users**

They can be called by users only for short, who run and use the programs on the computer.

#### **b) Programmers**

They are the people who write and design programs, as well as software developers who are working on developing new software. The interaction with the programs is done through the User Interface, through which data and instructions are entered and the information on the different output units is displayed.

***c) Maintenance technicians***

They are the persons responsible for computer maintenance, treatment and repair of any problems that may interfere with its work, whether it is hardware or software problems.

***Fourth: Data and information***

- The data is the raw material that is processed inside the computer, which is often in the form of various inputs (text - numbers - symbols - pictures - sound..etc), for example student's grades in different courses.
- As for the information, it is the product of processing and running data that gives added value to the user such as the student's total score or grade. It can be said that it is the output that the user wants to obtain.

***This will be covered in detail in the following chapters of the book.***



# Chapter 2

## Computer Hardware







## Computer Hardware

### Objectives

#### ➔ Main objectives:

1. Learn about the computer's Hardware.
2. Identify the factors that affect the computer's performance.
3. Learn about the numerical systems and data representation.

#### ➔ Secondary objectives

After studying this Chapter, the student is expected to master the following knowledge and skills:

1. Classifies the computer's hardware components to internal and external.
2. Knows the CPU.
3. Shows the types of memory modules.
4. Learn about input and output units.
5. Learn about storage media.
6. Learn the components of the motherboard.
7. Learn how to measure computer performance.
8. Distinguish between types of numerical systems.
9. Can switch between numerical systems.
10. Learn how to represent data on a computer.
11. Learn about the different types of coding.
12. Determines the factors affecting the improvement of computer performance.



## 2- 1 Introduction to the Computer Hardware

Computer Hardware: or (hard components) is considered as one of the most important components of the computer system, and it means all units, devices and accessories that make up the computer. Many of these components have appeared since the beginnings of the computer, and are still subject to continuous development in order to become more effective and efficient to meet the needs of different users.

Although there are many elements and parts that fall under the classification of physical components, which may reach hundreds, it is difficult to understand and cover all of them. In this chapter, we will be exposed to the most important components that are most used and meet the needs of the computer user sector. The computer hardware is divided into three main units: Input Units, Output Units, and System Unit (Primary and Secondary Memory, CPU). Figure (2 -1) shows the different computer's hardware components. Definition of the Computer's Hardware: all the computer's hardware parts that make up the computer or its accessories and perform one of the main functions of entering, extracting, or processing data and information

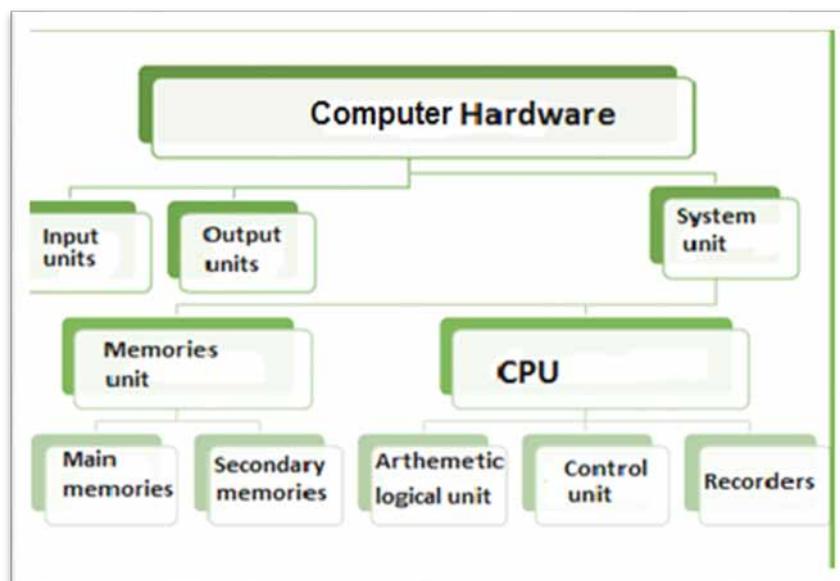


Figure 2 -1: Computer Hardware Components

We will learn about these components separately in details in the following sections of the current chapter.

**Skill 2 - 1**

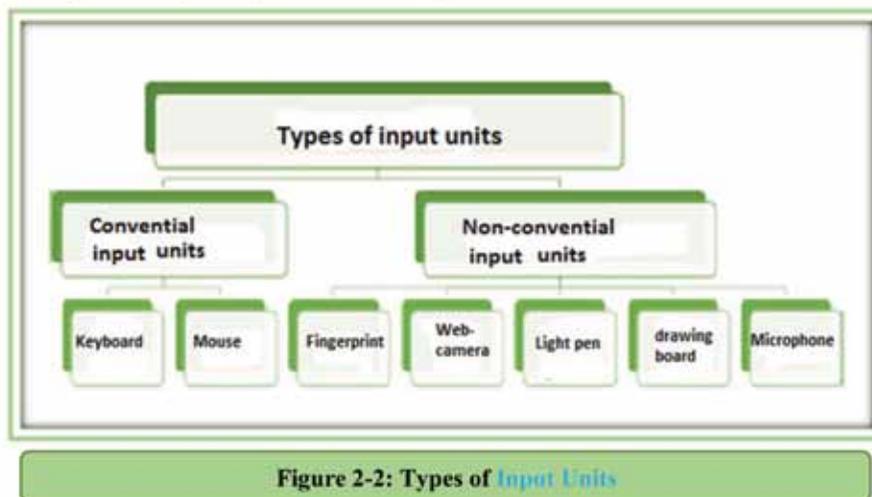
Knowing about the different types of input units.



**2 -2 input Units**

“Input Units” are the units responsible for entering data into the computer in its various forms.

Input units are classified into conventional (standard) input units, and non-standard input units. Figure (2 -2) shows the types and examples of traditional and non-traditional input units, and we will discuss in some detail these components separately in the following subsections.



**2 -2- 1 Conventional (standard) input units**

Standard input units consist of the keyboard and the pointing device (Mouse). The following is a clarification of each.

**Skill 2 - 2**

Knowing the basic components of the keyboard



**Firstly: the keyboard**

A keyboard has a number of keys used for data entry. It has several shapes and different types, including small-sized keyboard, regular keyboard, health keyboard, rubber keyboard, and a virtual (electronic) keyboard. Figure 23- shows those shapes.

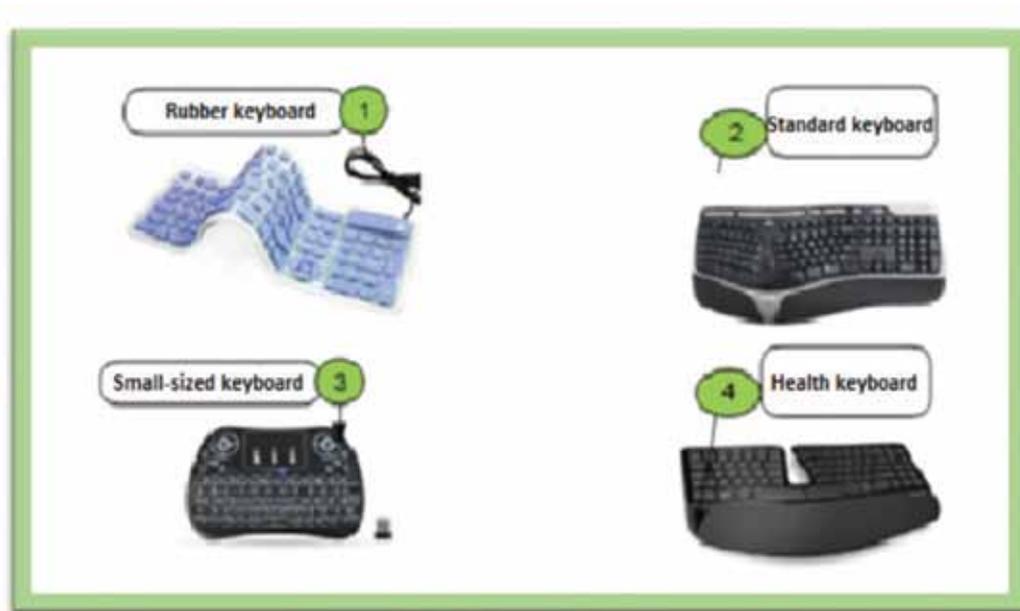


Figure 2-3: Keyboard shapes

- **keyboard parts:**

The keyboard consists of a set of parts as follows:

1. Alphabet and number keys: they are keys used to enter Arabic and English letters and numbers.
2. Number keys: this part is used when entering digital data and can be used for other functions.
3. Function keys (functions): they are located at the top of the keyboard. They are designated F1 to F12, and they have special functions specified by the operating system that works on the computer or program used. They are often used with Alt or Ctrl keys, for example F1 is used in almost every program as an auxiliary key (Ctrl + F4) is used to close the window.
4. Cursor keys: they are four keys used to move the cursor, when writing in the four directions.
5. Escape key (ESC): used in many applications to cancel an operation and some call it an escape key.
6. Caps Lock: Converts foreign characters from lowercase to uppercase and vice versa.
7. Enter key: moves the cursor to a new line in various application programs.

Figure 2 -4 shows the different parts of the keyboard.



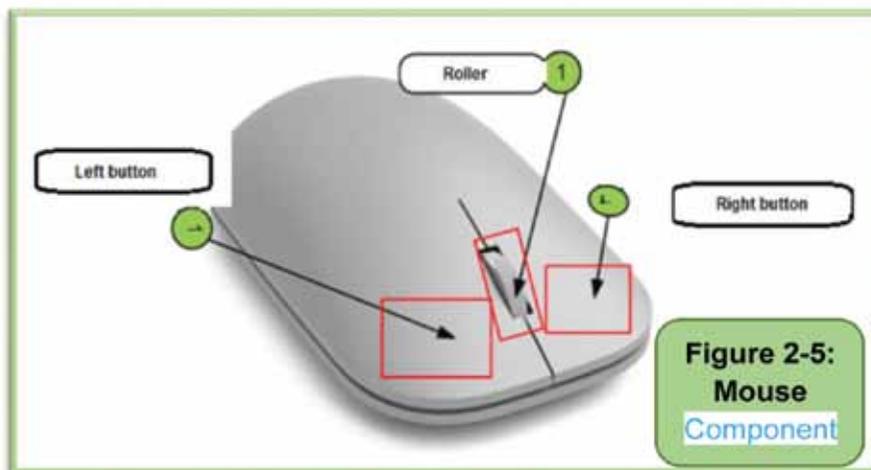
**Figure 2-4:**  
**Keyboard**  
**Components**

**Skill 2 - 3**  
Knowing the basic components of the mouse



**Second: Mouse**

A pointing device, which controls the cursor on the screen and enters orders by clicking or dragging. It consists of two buttons, the right button, the left button, and a reel between them. The mouse is connected to the computer via either (USB) or (PS2) as shown in Figure 2 -5.



**Types of Mouse:**

1. **Ball Mouse:** contains a ball inside it, and when the mouse is moved, the ball moves and the cursor moves on the screen and was used in the past.

2. **Optical Mouse:** contains an electronic chip inside it and emits a light beam from a bulb below it. The pointer moves according to moving the mouse on a smooth surface that touches the beam.
3. **Wireless Mouse:** a modern mouse and works without wire and is connected to the computer by connecting an electronic piece to the USB port.

### **Mouse buttons**

*Here is a simplified explanation of what the mouse keys can do:*

1. Left button: the most used button for controlling different icons, windows and multiple GUI objects. Left button used by moving it once to select the object or icon, or double clicking on it to open the selected object or clicking and dragging it to move an object.
2. Right button: Clicking on it displays a list of shortcut options, for example when clicking on a folder, a list of shortcut options appears (copy, paste, etc.).
3. Roller: used to move the text inside documents and internet pages open up or down, and it helps the user in browsing faster

## **Skill 2 - 4** Knowing about non-traditional input units



### **2 -2 -2 Non-traditional input**

Examples of recent input units such as microphone, drawing board, optical pen, fingerprint reader, and web camera, are known as non-conventional input units. Non-conventional input units may be unnecessary for entering the basic data on the computer, where the user can dispense with it or some of them. The operator remains in contact with the computer via the keyboard and mouse only, but perhaps the user needs it to enter special types of data such as voice commands, pictures, fingerprint or other. Table 12- shows a brief description of these units

Table 1 -2 Non-standard input units

Input unit name	Description
 (WebCamera)	Usually used to enter snapshots or video clips after connecting them to the computer, and may be necessary in the event of entry using the fingerprint or face print.
 (Light Pen)	Pen pointing device. The pen tip contains a photosensitive element, when placed on the screen, detects light from the screen, allowing the computer to locate the pen on the screen.
 (Digitizer)	It consists of a pen and a sensor board. The pen is used to enter data by writing or drawing on a sensitive plate, and it allows entering handwritten data on the computer. The plate is a pointing device that facilitates the introduction of drawings and designs
 (Microphone)	Used to insert audio into the computer via a connection in the slot designated for it on the sound card, and this is accomplished by using special programs for audio recording.
 (Fingerprint Reader)	It is an electronic device that reads and inputs fingerprints of persons authorized to use the device, where the person's identity can be identified by matching the readable fingerprint to those fingerprints stored in the device.

**Skill 2 - 5**  
Knowing about the output units



**2-3 output units**

Output Units are used to display information stored on a computer. These units represent the means of computer communication with the outside world. The output may be in the form of displaying information on the screen, sound through the speakers, or information printed on paper. Output units are divided into two types:

- Conventional output units include screen and printer.
- Non-ventional output units, including headphones, data projectors, and graphics.

### 2-3-Traditional(Standard) Output Units

#### Firstly: the screen

Screen is one of the most important output units. It is used to display information and graphics visually, and it communicates with the computer via the display card responsible for sending data to display. Among the most important factors that affect the quality of the image on the screen is the screen resolution represented by the number of points that make up the image, known as pixels. There are many types of displays that differ from each other in terms of size, accuracy, and/or images visualization used technology. Table 22- shows these types

Table 2- 2 Types of computer screens.

Screen Name	Description
 (CRT)	CRT is an abbreviation (Cathode Ray Tube), which is a monochrome screen, and it has the characteristics that it is large in size, heavy in weight, producing heat when it is operating for long periods, inexpensive in its manufacture, and is rarely used today.
 (LCD)	LCD is an abbreviation (Liquid Crystal Display) characterized by clarity, thin, and lightweight screens. Among its characteristics are: <ul style="list-style-type: none"> <li>• It takes up less space than a CRT monitor does.</li> <li>• Good lighting.</li> <li>• Limited viewing angle.</li> <li>• It consumes less power than CRT monitor.</li> <li>• Somewhat expensive, the most used nowadays.</li> </ul>
 (LED)	LED is an abbreviation (Light Emitting Diode). It's characteristics are: <ul style="list-style-type: none"> <li>• It has more accurate color tones than the LCD.</li> <li>• The most expensive ones.</li> <li>• It takes up less LCD space.</li> <li>• Good lighting.</li> <li>• It consumes less power than the LCD screen.</li> <li>• Viewing angles better than LCD.</li> </ul>
 (PLASMA)	It considered the very good and modern screen. It's characteristics are: <ul style="list-style-type: none"> <li>• In addition to the slim feature, it is flat</li> <li>• Provides multiple viewing angles.</li> <li>• Available in large sizes.</li> <li>• It consumes a lot of energy.</li> <li>• Its shelf life is longer than LCD and LED.</li> </ul>

Skill 2 - 7

Distinguishing between different types of printers.



**Secondly: Printers**

Printer is considered one of the most important and most widely used output units after screen and it is used to print information on paper (text documents, reports, pictures and drawings). In terms of technology used, printers are divided into four types. As shown in Figure 2 -6.

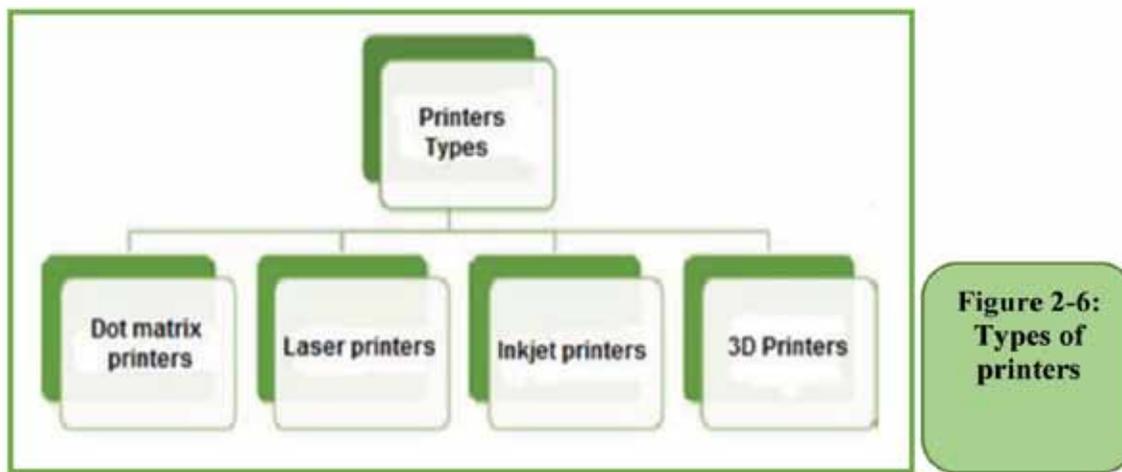


Figure 2-6: Types of printers

Table 2- 3 Presents a brief description of the different types of printers.

Printer Type	Description
 (Dot matrix printers)	One of the oldest types of printers. It spread in government institutions, and the idea of its work is to draw letters or graphics to form a set of points anchored. The head of the printer do this, and the papers continuously fed.
 (Inkjet)	Used to print documents and pictures. Its work principle depends on creating letters or drawing by pumping fine drops of ink on paper. It is widely used in personal for few printing. Most of them are colored types.
 (Laser printer) (Laser printer)	The most popular now as it prints several pages in one minute. It is faster than high quality, Dot matrix printers, economical compared to inkjet printers.

Printer Type	Description
 (Multi -Function Printer)	One of the latest printers, which include several built-in-functions into one machine. The availability of this printer permits printing, scanning, copying and working as fax machines.
 (D Printers 3)	A type of printer that creates solid models, three-dimensional forms that are entered through the special design software.

Table 2 -3 Examples of Printers' Types

### 2 2-3-Non -conventional output units

**Skill 2 - 8**  
Knowing about non-traditional output units.



Non-conventional output units represent a group of different devices that output information in a variety of ways and shapes, such as headphones, data projector, and graphics. Table 2 -4 shows a brief description of these examples.

Table 2 -4 Non-conventional (Non-Standard) Output Units

Output unit name	Description
 (Speaker)	The headphones work to extract sound from the computer, and is usually used with multimedia. Headphones found in different shapes and capacities, some of which are equipped with a magnifier and some are in the form of headphones.
 (Data Projector)	A device that communicates with the computer to display the computer's visible outputs of text, images and video on a display or wall with enlarging it, and it is available in different sizes and possibilities (small data projector - regular data projector)

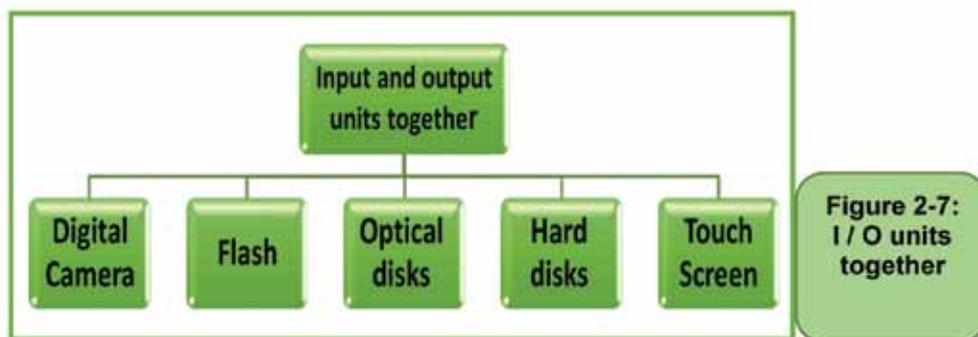
Output unit name	Description
 (Plotters)	One of the most expensive and most recent printers. It is a large printers used to print huge pictures and blueprints with high accuracy. These printers are distinguished by their ability to characterize thedegrees of colors when printing.

**2 -4Units of input and output together**

**Skill 2 - 9**  
Knowing about the input and output units together.



There are some devices that work as input and output units together at the same time as hard disks, optical disks, flash and digital camera, and the touch screen which is a transparent layer covering the display screen in computers, mobile phones or tablets, it senses hand movements and writes them with a special pen. Optical discsFigure 2 -7 shows these units.

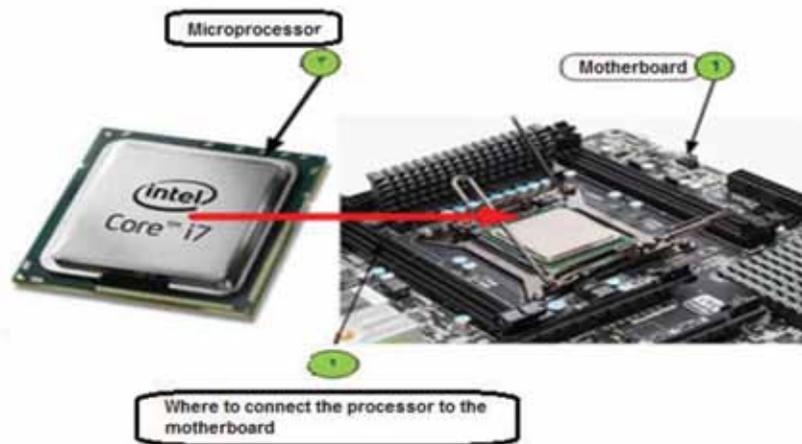


**Skill 2 - 10**  
Knowing about the main components of the CPU.2- 10.



**2- 5 Central Processing unit (CPU)**

The Central Processing Unit-Processor-CPU is the most important part of a computer. It considered the pulsed heart of the computer and is usually called a processor. It is a semiconductor chip on which millions of integrated circuits are placed. Figure 2- 9 shows the microprocessor and its connection location on the motherboard.



It has become possible to provide the computer with more than one central processing unit, especially in network servers, supercomputers, and others. In addition, CPUs have more than one core for processing, which means that a single processor works like a group of processors working together at the same time.

## Skill 2 - 11

Knowing about the characteristics of the processor.



### **2-5-1 Characteristics that distinguish the processor**

#### **1. Clock Speed**

The computer's speed is estimated at the processor speed and measured in MHz and Gigahertz. Today, the computer speed is measured in GHz, for example, if it's 2GHz., that means it can perform a number of operations equivalent to two billion operations per second.

#### **2. Coresnumber**

In the past, the processor contained only one core that does all the work alone, but with the development of applications and the need to perform many tasks at the same time, a number of the core was added to the processor, which increased the processor speed, and new processors were issued with the following cores:

- Core i9
- Core i5 Mobile
- Core i7 Mobil
- Core i3
- Core i5
- Core i7

#### **3. Processor Memory (Cache)**

A temporary memory similar to the RAM, but it is much smaller and fixed in the processor itself. The secret of its importance is that the processor accesses it

much faster than the RAM, and it is one of the things that affect the speed of the processor when working with many multiple tasks at the same time.

## 2 2-5-CPU components

### 1- Control unit

Control Unit (CU) is a group of electronic circuits responsible for managing all the operations necessary to implement the various orders, it works to transfer data to and from the arithmetic logical unit (ALU) , registers, main memory and input and output units.

### 2- Arithmetic logic unit (ALU)

3- The Arithmetic Logic Unit (ALU) is the unit responsible for all mathematical operations such as (addition, subtraction, multiplication, division, and raising of an exponent) and logical operations such as (positivity and negativity coefficients) within a computer, and it consists of a number of integrated circuits and recorders of various tasks4.- Registrars

Registers are special storage locations with very high speeds that are proportional to the speed of the processor and any malfunctions in them.

- **Registrars are divided into:**

1. Data registrars: in which data are dealt with in terms of storage and logical and mathematical operations.
2. Address registrars: in which the different addresses are stored.
3. Cases Recorder: records the processor condition after executing a specific order.

- **The function of recorders:**

- 1- Control the implementation of the program.
- 2- Temporary retention of information and results.

### 4- Buses

Bus is a set of electronic lines through which exchanges are made between computer components. There are three buses inside and outside the processor, which are:

1. Address Bus: Used to assign addresses to different places in the memory or the input and output ports in order to transfer data from them, and the memory consists of a group of stores for each address. If the processor wants to read content stored in the memory, the address must be sent via the address bus.

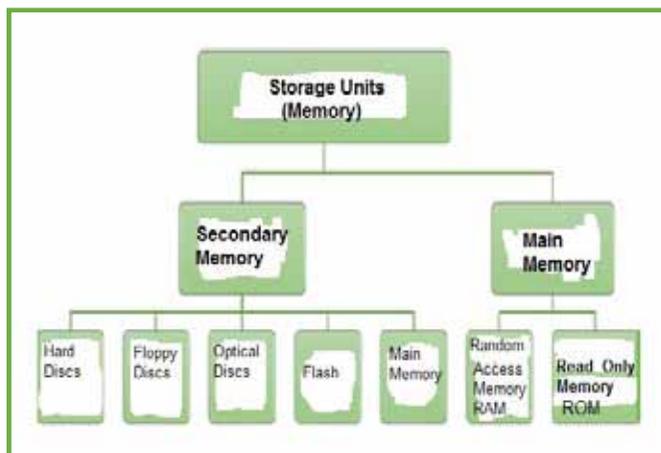
2. Data Bus: is the data bus that transfers data from the processor to the units or vice versa. The number of wires per data bus changes according to the processor(64 ,32)
3. Control Bus: Consists of a set of wires whose function is to synchronize events in a synchronous manner and control memory and I/O units from the processor end. Control bus used to coordinate operations and communicate with external components.

**Skill 2 - 12**  
Classification of storage units.



**2 -6 Storage units (memory)**

A group of electronic circuits that are used to save data and programs. Storage units are divided into two types, the basic memory and the secondary memory. Figure 2 -9 shows the primary and secondary storage types, and we will discuss these units in some detail.



**Figure 2-9:**  
Different types of storage units

**2 -6- 1 Main memory is divided into two types**

- Random Access Memory (RAM)
- Read Only Memory (ROM).

**Firstly: Random Access Memory**

**Skill 2 - 13**  
Knowing about RAM.



RAM is an abbreviation to (Random Access Memory), which is a memory in

which data is stored in the computer and the storage of commands and programs necessary to process that data as well as storing the final results. Among the characteristics of random access memory are: read and write memory, lose all its contents once the power is off.

The random access memory is an essential part of which the computer cannot work without. The size and speed of this memory greatly affects the performance of the computer in general and programs in particular.

This memory consists of integrated electronic circuits, which consists of millions of cells that can store data temporarily (transistors and capacitors). Only one bit (BIT) can be stored in each memory cell, and the speed of memory is measured in unit of frequency, which determines the speed of data exchange between the memory and the rest of the associated computer parts. RAM size is measured in byte and its multiples or capacities.

Currently, the capacity (capacity) of one chip of RAM can reach 64GB or 128GB. Figure 2- 10 shows the RAM types.

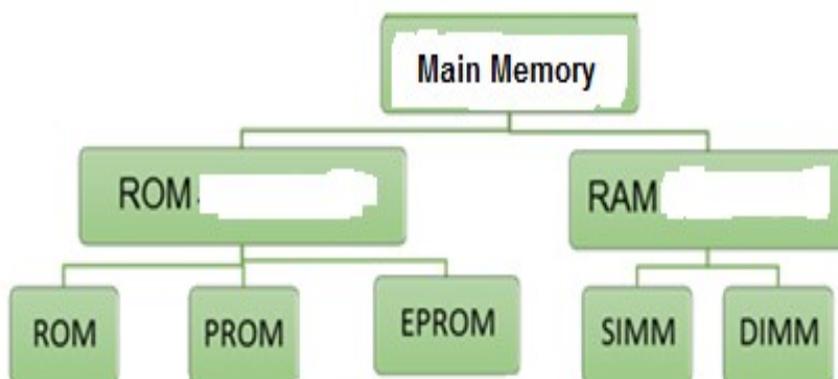


Figure 2-10:  
The main  
memory and  
its types

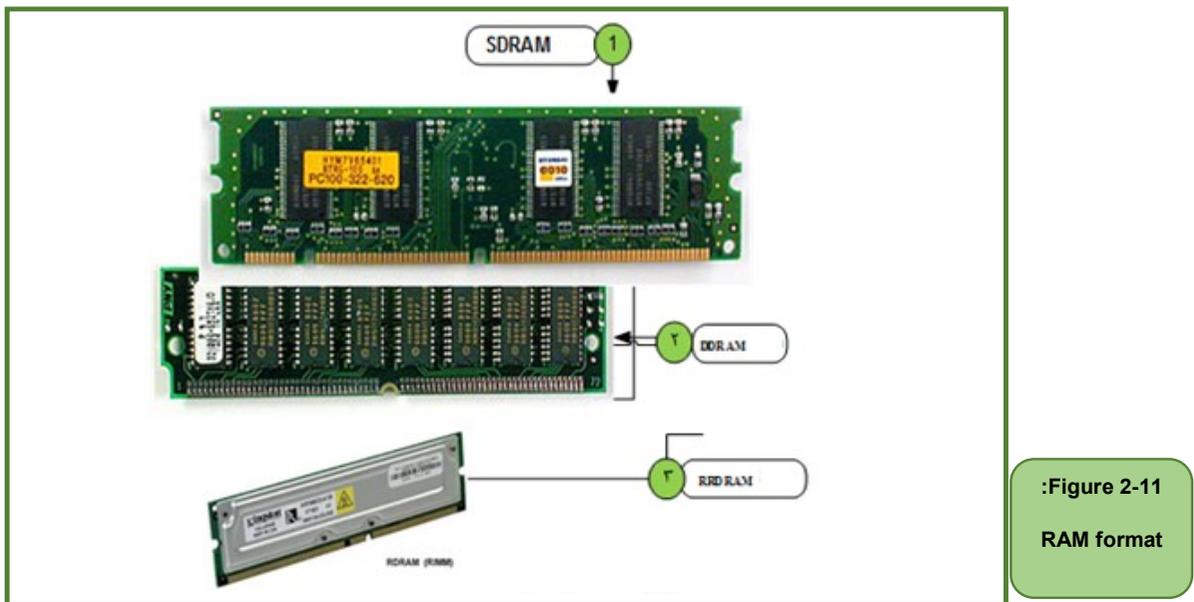
### • Types of RAM

There are two main types of RAM: static random access memory (SRAM) and dynamic random access memory (DRAM), and there are also several other types of RAM.

1. Static Random Access Memory (S-RAM): a type of random access memory called Static RAM, or SRAM. It is called this name because its contents do not change over time, as it keeps its contents as they are as long as they are continuously fed, and SRAM memory is characterized by high speed, but it is defective in high cost, compared to DRAM
2. Dynamic Random Access Memory (D-RAM): called Dynamic RAM or DRAM, it loses its contents gradually over time and needs to rewrite the

contents periodically. DRAM memory has the advantage of being able to be manufactured at high capacities and at low cost, and it is characterized by its consumption of electrical energy less than the SRAM. Therefore, DRAM is now widely used in PC's as Main Memory. The drawback of DRAM memory is that it loses its contents over time.

Currently, there are modern and advanced types of DRAM, such as Synchronous DRAM or Synchronous DRAM. As in recent years, the SDRAM itself has been developed into what is called DDR SDRAM or (Double Data Rate SDRAM). In this type of RAMs the memory speed is doubled using process of performing two operations of reading or writing in a single synchronization pulse, where one process is carried out at the upward edge of the synchronization pulse, and the other operation is at the downward edge of the synchronization pulse. Figure 211- shows some types of this memory.



**Skill 2 - 14**  
**Knowing about ROM.**



**Secondly: Read-Only Memory (ROM)**

ROM is an electronic chip in which very important data is stored by the manufacturer, and no modification of its contents can be made except by special methods for some types. ROM is characterized by that it does not lose its contents by power outages, so some parts of the operating system and programs that

are not allowed to be edit or delete it are stored on it. For this reason, it called the read-only memory and one of its tasks is to supervise the operation of the computer. Figure 211- shows the ROM types.

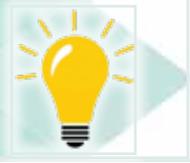
- **Among the types of permanent memory are:**
  1. One time programmed memory (ROM).
  2. Programmable memory (PROM) which cannot be modified after programming it.
  3. A programmable and erasable memory, that is, it can be erased and reprogrammed (EPROM).

Table 25- shows the most important differences between RAM and ROM:

Comparison scope	ROM	RAM
Writing Process	Programmed ROM while manufacturing is written-proof	Writing on it is done by the processor
Current Effect	ROM contents is fixed and not lost with power outages	Lost its contents when the power is off
Programming Possibility	Once by the manufacturer	Programmed as needed
Usages	To store some programs to boot the computer	For the computer's necessary operating programs and various programs

Table 2 -5 The most important differences between RAM and read-only memory.

**Skill 2 - 15**  
Knowing about Secondary Storage Units.



**2- 6 -2 Secondary Memory (Secondary Storage Units)**

Secondary storage units are special units for storing data, information and programs inside the computer. They are also called storage media. When entering any data into the computer, it must be saved as files in order to remain present when the computer is closed. Secondary storage units also evolved a lot with the development of the computer. Secondary memory divided into two types:

- Internal Storage: Example of Hard Disks
- External storage: Example of Flash memory and CDs.



**Figure 2-12:**  
Form of secondary memory types

Figure 2- 12 shows pictures of some types of secondary volumes widely spread, and Table 2 -6 shows the most important of these units with a brief description of each.

**Table 2 -6 Themost important storage devices used in the computer**

Storage Unit	Properties
(Floppy Disks)	<p>Can hold a small amount of information and has two types:</p> <ul style="list-style-type: none"> <li>• 3.5inches that accommodates 1.44 MB, 2.88MB</li> <li>• 5.25 inches that accommodates 360 KB, 1.2 MB</li> </ul> <p>Each of its two types has its own player. It was used in the past.</p>
Hard Disks	<ul style="list-style-type: none"> <li>• Units for storing data and programs inside the computer.</li> <li>• Have a high storage capacity.</li> <li>• Their storage capacity varies to currently 2TB.</li> </ul>
(CDROM) (DVDROM)	<p>Considered one of the latest secondary storage media, as it relies on information recording technology using laser beams.CDs are divided into:</p> <ul style="list-style-type: none"> <li>• CD-ROM and DVD readers only.</li> <li>• Multiple writing and reading discs. RW.CD.</li> <li>• Disk capacities range from:</li> <li>• CD.R: The first species with a capacity of 700MB.</li> <li>• DVD: Type II with a capacity of 4.7GB.</li> </ul>

Storage Unit	Properties
(Flash memory)	One of the latest storage units. Small operator that connects to the computer through the USB port. Flash memory has high storage capacities, easy to use and move. Its capacity is available in different sizes ranging from 16GB to 2TB at the present time.

**Skill 2 - 16**  
Knowing about the Motherboard



**2- 7 Motherboard**

Motherboard is also known as the Main Board and System Board. The motherboard is called this title because it connects all the physical devices that make up the computer from input and output units, processing unit, memory, and others. Its function is to pass data between the different units of the device through the data lanes and it has slots for connecting different cards, and the most famous motherboard manufacturers are Intel-ASUS - Gigabyte. Figure 2 -13 shows an image of the motherboard most important components.

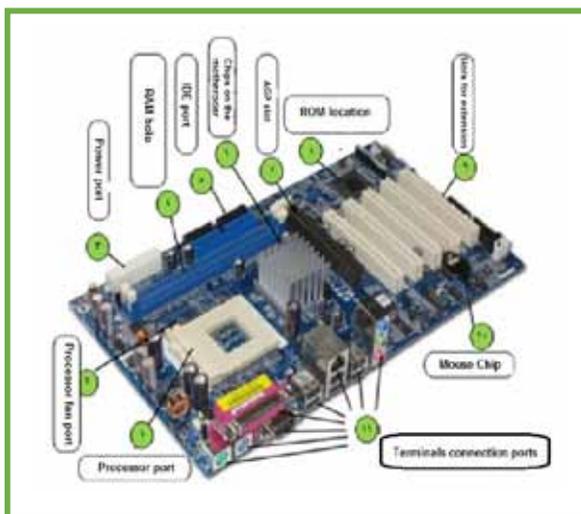


Figure 2-13:

The most important components of the motherboard

Table 2.7 Explains the function of the motherboard components.

**Table 27- Main components of the motherboard**

Port №	Name	Function
1	Processor socket	Used to connect the microprocessor (CPU).
2	CPU fan socket	Used to connect the processor's fan.
3	Power socket	Used to connect power to the motherboard.
4	RAM slot	A place to connect the RAM modules is usually 2 to 4 slots on the motherboard.
5	IDE socket	IDE (Intelligent Drive Electronics) socket used installation of hard and CD drives (usually two).
6	Chips on the motherboard	Integrated circuits installed on the motherboard by the manufacturer and it performs several functions.
7	AGP slot	AGP (Accelerated Graphics Port) expansion slot for screen card only. Not present on older boards and is characterized by high speed.
8	Read-only memory site	Installed on the motherboard and cannot be changed.
9	PCI Expansion Cracks	PCI (peripheral component interconnect) expansion slots are data transfer lines inside the motherboard and will be used to connect sound cards, modems, etc.
10	Slice of confusion	The basic input and output system and BIOS abbreviation for Gateway
11	BIOS	(Basic input output system), located on electronic chips and installed on the motherboard. Responsible for many functions, including those for computer boot process.

### Skill 2 - 17

Knowing the most important ports on the motherboard.



#### 2- 8Ports

Ports are the places through which some external computer peripherals such as input or output units and some other devices are connected to the motherboard. Table 28- shows the most important external ports, visible to the user, and connected to the motherboard.

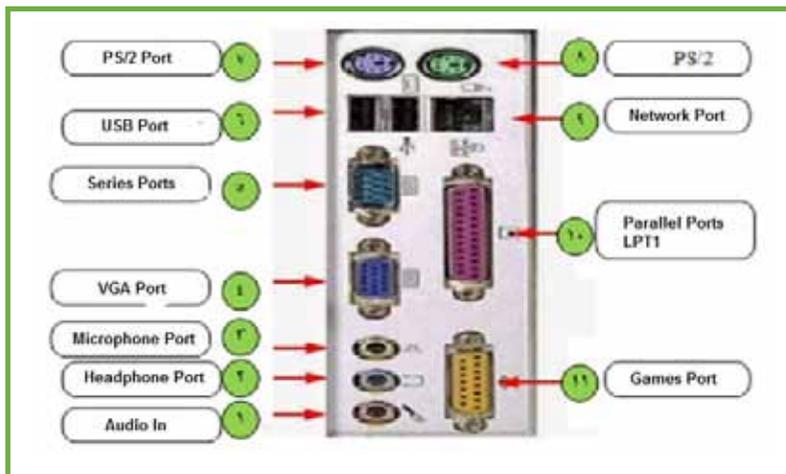


Figure 2-14:  
The most important ports on the motherboard

Table 28- The most important ports on the motherboard

Port N <sup>o</sup>	Port Name	Function
1	Audio in	Used to record audio from an external computer
2	Headphone port	Used to extract sound from the computer for headphones
3	Microphone port	Used to record the user's voice with the computer.
4	VGA port	Used to connect the display screen with the computer
5	Serial Ports	Used to connect several accessories. Not used frequently to slow them down.
6	USB port	Specially for connecting many accessories to a computer such as a mouse and keyboard.
7	PS / 2 port	Used to connect the keyboard to the computer and rarely used.
8	PS / 2 port	Used to connect a mouse to a computer and rarely used.
9	Network port	Used to connect the computer to the network, whether local or global.
10	LPT1 parallel ports	Used for connecting some types of printers.
11	Game port	Used to connect gaming accessories to a computer.

**Skill 2 - 18**

Distinguishing the most important types of cards that are connected to the computer

**2-9 Cards**

Cards are small electronic boards that are plugged into the expansion slots on

the motherboard to connect various hardware accessories to the motherboard such as a screen card to link the screen, or a sound card to connect sound devices, etc., and the cards differ in type and performance.

Table 27- shows the most important card that can be connected to the motherboard.

**Table 2- 9 the most important card that is attached to the motherboard**

Card	Description
 Screen card	The screen card connects to one of the expansion slots on the motherboard such as PCI-AGP, but the modern screen card connects to the AGP slot for its high speed, and this card can contain memory to speed up the display of pictures and graphics.
 Voice card	The sound card is plugged into the PCI slot if the sound card is not built on the motherboard, and the slots on the sound card are LINE OUT to connect the headphones, MIC to connect the microphone, and LINE IN to connect an external device from which the sound can be recorded.
 Network card	Often the network card is plugged into the PCI slot, if the network card is not built on the motherboard, and one of the LAN networks cables is connected to the computer to provide a carrier medium between the computer and the network

**Skill 2 - 19**  
Knowing about the factors affecting the speed of a computer



## 2 -10 Measuring the Performance of Computers

**Computer performance is measured by the following measures:**

- Processor Speed: Control the speed of a computer. Speed is measured in a unit called GHz. The higher the speed, the better the performance.
- Capacity and speed of random memory: It affects very much the performance of the computer and the memory capacity is measured in gigabytes and speed in Megahertz, the more memory capacity increases its speed, the performance of the computer improves.

- Speed and size of the hard disk: Both the speed and capacity of the hard disk affect the performance of the computer the higher the speed and capacity the larger the better the performance of the computer and vice versa.
- Software: The programs running at the same time affect Computer performance. The more programs run at the same time, the less computer performance, especially programs that require more memory, such as multimedia programs.
- Screen Card: The screen card affects multimedia programs such as video, pictures, and animation, and does not affect browsing other programs that need a fast screen card.
- SSD storage disk: a disk for storing data of large and different capacities and overcomes the hard disk in terms of high speed in storing and retrieving data from it and the cost, and it is available in modern devices instead of the regular hard disk.
- Other factors: One of the factors that lead to a slow computer is also the increase in the temperature of the computer, due to the interruption of the processor-cooling fan, for example, or from the accumulation of dust.

**Skill 2 - 20****Knowing about the various Number systems****2- 11 Numerical Systems**

The computer deals with binary numbers only (0,1), special characters and symbols are converted, and the numbers are converted into pulses (0,1) and processed by the microprocessor, then the results appear, which are converted from their digital form to their first form and appear on the different output units.

There are many numerical systems to represent numbers and we will address the most famous of these systems: the decimal system, the binary system, the octal system, and the hexadecimal system.

The decimal system was used in the first computers in the period from 1946 to 1949 AD, after which the computer developed and used semiconductors in its manufacture and works according to the octet and hexadecimal system and then the binary, which is the basic system used in computers.

### 2-11-1 Decimal System

The decimal system is one of the oldest. It has been called decimal because it consists of ten numbers, from zero to nine, which in turn form the basis of the decimal system. Among the characteristics of the decimal system are:

- The base of the system equals 10
- Set of symbols used in the system {0,1,2,3,4,5,6,7,8,9}

### 2-11-2 Binary System

Binary System is the system used to represent numbers, letters and symbols in a computer internally, according to ASCII code or other codes. Among the characteristics of the binary system- :

- The base of the system equals 2
- The set of numbers used in the system {0, 1}

Table 2- 10 shows the decimal number and the binary equivalent.

**Table 2- 10 The decimal number and the binary equivalent.**

Decimal number	Binary Equivalent
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001

### 2-11-3 Octal System

The Octal System consists of 8 numbers, which are from zero to seven, which in turn represent the basis of the octal system. The characteristics of the octal system are:

- The base of the system equals 8
- The set of numbers used in the system are (0,1,2,3,4,5,6,7)

**22- 11 -4 The Hexadecimal System**

The hexadecimal system consists of sixteen digits and this system is used to address the main memory. The characteristics of this system are:

- The base of the system equals 16
- The set of numbers and letters used in the system are (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F).

Table 211- shows the hexadecimal number, decimal number, and binary equivalent.

**Table 211- Decimal, binary and hexadecimal systems equivalents.**

Decimal System	Binary System	Hexadecimal System
0	00	0
1	01	1
2	10	2
3	11	3
4	100	4
5	101	5
6	110	6
7	111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E

**Skill 2 - 21**

Conversion between different numerical systems



**212- Conversion between different numerical systems**

**2 -12- 1 Conversion from binary to decimal**

To convert any binary, octal, or hexadecimal number to its decimal equivalent, we must use the positional representation law for numbers. Note that the base of the counting system in the binary system is  $b = 2$

$$D = d_0x^0 + d_1x^1 + d_2x^2 + d_3x^3 + \dots + d_nx^n$$

Where  $d_0$  = block number zero,  $d_1$  = block number 1,  $d_n$  = block number n and so on.

Since b is the base and equals 2,  $2^0 = 1$ ,  $2^1 = 2$ , and so on.

Example 1: Converting issue  $(100111)_2$  from binary to decimal?

$${}_2(100111(????))_{10} = (100111)_2(????)_{10} = ($$

**Solution:**

$$D = 1x2^0 + 1x2^1 + 0x2^2 + 1x2^3 + 0x2^4 + 1x2^5 = 139 = 32 + 0 + 0 + 4 + 2 +$$

$$\therefore (100111)_2 = (39)_{10}$$

### **2-12 -2 Converting from decimal to binary**

Several methods are used for the solution, and one of these methods is the remainder method, as the decimal number is divided by 2 and the repetition of this process is done until the division process ends while retaining the rest every time. Therefore, this method is called the rest method from the bottom up, and the remainder forms the binary number. The conversion steps can be illustrated as follows:

1. Divide the decimal number by the number 2.
2. Calculate the remainder of the division, which is either 1 or 0.
3. Divide the previous division result by base 2 as in step 1.
4. Calculate the remainder of the division as in step (2).
5. Continue the division process and determine the remainder until the correct division outside becomes zero.
- 6) The required binary number consists of the remainder numbers read from bottom to top and written from left to right, the lower cell is the upper cell (MSB) of the binary number, and the lower cell is (LSD) of the binary number.

Example 2: Converting the number 39 from the decimal system to the binary system?

39	/	2	=	19	→	1	↑ LSB MSB
19	/	2	=	9	→	1	
9	/	2	=	4	→	1	
4	/	2	=	2	→	0	
2	/	2	=	1	→	0	
1	/	2	=	0	→	1	

**Solution :**

$$\therefore (39)_{10} = (100111)_2$$

### 2-12-3 Conversion from decimal system to octal system

To convert the number from the decimal system to the octal system, we follow the remainder method used when converting from the decimal system to the binary, bearing in mind that the basis here is 8.

Example 3: Convert the number 39 from the decimal system to the octal system?

39	/	8	=	4	→	7	LSB MSB
4	/	8	=	0	→	4	

**Solution:**

$$\therefore (39)_{10} = (47)_8$$

### 2-12-4 Converting from Octal to Decimal

To convert any octal number to its decimal equivalent, we must use the positional representation law of numbers. Note that the base of the counting system here is  $b = 8$

$$D = d_0 \times b^0 + d_1 \times b^1 + d_2 \times b^2 + d_3 \times b^3 + \dots + d_n \times b^n$$

Example 4: Convert the number 47 from octal to decimal system?

Solution:

$$(47)_8 = 7 \times 8^0 + 4 \times 8^1 = 7 + 32 = 39$$

$$\therefore (47)_8 = (39)_{10}$$

**Example 5:** Convert the number  $(18)_8$  to the decimal system

**Solution:**

$$(18)_8 = 8 \times 8^0 + 1 \times 8^1 = 8 + 8 = 16$$

$$\therefore (18)_8 = (16)_{10}$$

### **5- 12 -2 Transfer from the hexadecimal system to the decimal system**

To convert any hexadecimal number to its decimal equivalent, we must use the Localization Act of numbers. Note that the base of the counting system here is  $b = 16$

$$D = d_0 \times b^0 + d_1 \times b^1 + d_2 \times b^2 + d_3 \times b^3 + \dots + d_n \times b^n$$

Example 6: Convert  $(27)_{16}$  to the decimal system?

**Solution:**

$$(27)_{16} = 7 \times 16^0 + 2 \times 16^1 = 7 + 32 = 39$$

$$\therefore (27)_{16} = (39)_{10}$$

**Example 7:** Convert 16 (3F) to decimal

The solution

$$(3F)_{16} = 16^1 \times 3 + 16^0 \times 15 = 48 + 15 = 63$$

$$\therefore (3F)_{16} = (63)_{10}$$

### **2 -12 -6 Conversion from the decimal system to the hexadecimal system**

Several methods are used, and we will take one of these methods, which is the remainder method, as 16 divide the decimal number and the repetition of this process until the division process ends with retaining the remainder each time, so this method is called the rest method, and the remainder forms the sixteenth number.

**Example 8:** Convert the number 39 from the decimal system to the hexadecimal system?

$$\begin{array}{r} 39 / 16 = 2 \rightarrow 7 \text{ LSB} \\ 2 / 16 = 0 \rightarrow 2 \text{ MSB} \end{array}$$

**Solution:**

$$\therefore (39)_{10} = (27)_{16}$$

### 2-12-7 Transfer from Hexadecimal to Binary

We take the first hexadecimal number from the left and replace it with four binary numbers and then we take the next hex number and replace it with four binary numbers and so on.

Example 9: Convert  $(11)_{16}$  to binary.

**Solution:**

$$(11)_{16} = (0001\ 0001) = (10001)_2$$

$$\therefore (11)_{16} = (10001)_2$$

### 2-12-8 Conversion from binary to hexadecimal

We divide the binary number into quadrics from right to left and replace each group with its hexadecimal equivalent.

**Example 10:** Convert the binary number 1010001011011111 to the hex equivalent.

**Solution:**

$$(1010001011011111)_2 = 1010\ 0010\ 1101\ 1111 = A\ 2\ D\ F = (A2DF)_{16}$$

$$\therefore (1010001011011111)_2 = (A2DF)_{16}$$

## 2-13 Representing Data Inside a Computer

The data inside the computer is represented by pulses (0, 1), the data (numbers - letters - pictures - symbol) can be encoded as 0, 1 according to the coding used, and the most popular coding systems used are:

### 2-13-1 ASCII code

ASCII code is an acronym for (American Standard Code for Information Interchange). ASCII code is a binary code consisting of seven cells used to represent

symbols, for example, the letter A takes the code 1000001, the letter a takes the code 1100001, The number 1 takes the code 0110001, and the% sign takes the code 0100101. The code that used for a certain purpose is currently the most widespread. ASCII code illustrated in table 2 -13. Table 2 -12 shows the binary codes used to represent some symbols of ASCII code

**Table 2 -12 Binary codes used to represent some symbols in an ASCII**

Code	Equivalent in ASCII	Equivalent in octal system	Equivalent in hex system	Equivalent in decimal system
A	1000001	101	41	65
B				
a	1100001	141	61	97
b				
1	0110001	61	31	49
2				
%	0100101	45	25	37

\*Use ASCII code table, Appendix to conclude the rest of the capital letters and lower case letters?.

### **2 -13 -2Unified Global Coding**

Unified Global Coding(Unicode)is also known as (UTF8). Itis stated a setting to represent the Unified International Character System, which is a standard for the alphabet of the world’s languages, symbols encoded in a size ranging from 8 bits to 32 bits per symbol (Unicode UTF8, Unicode UTF16, and Unicode UTF32). The UTF-8 format is the most widely used, especially in HTML.

One of UTF-8 most important features is that it contains the ASCII code inside it, meaning that the system that operates with the ASCII code canbe accommodated in the global standard code. All letters of the Arabic language are represented by the global standard code.

**2 -13- 3 Binary coded decimal (BCD) system code**

BCD code is an abbreviation for (Binary Coded Decimal), and it is one of the first codes that were used in the computer systems. BCD used to represent the integers in old large computers. In this code, each number from the numbers 0 -9 is represented using a binary code consisting of four digits. This shown in Table 2 -13: BCD Code.

Table 213-: BCD code

Code	Digit
0000	0
0001	1
0010	2
0011	3
0100	4
0101	5
0110	6
0111	7
1000	8
1001	9

To represent any integer using the BCD code, we take the number digits in the decimal form and replace each digit with its own BCD code.

Example 11: represent the integer 1439 using BCD code?

1	4	3	9
0001	0100	0011	1001

**Solution:**

By gathering the codes,we get the following result:

$$\therefore 1439 = (1010000111001)_{BCD}$$

Example 12:represent the integer 2018 using BCD code?

**Solution:**

2	0	1	8
0010	0000	0001	1000

By gathering the codes, we get the following result:

$$\therefore 2018 = (10000000011000)_{BCD}$$

### 2-13- 4 Decimal Binary Coded Decimal System

EBCDIC is an abbreviation of (Extended Binary Coded Decimal Information Code). Which is a development of BCD code to be able to represent symbols, which is very similar to ASCII code. EBCDIC was used to represent symbols on large computers. Table 2- 12 shows the EBCDIC Code.

**Skill 2 - 2**

Knowing about different Storage Capacity Measurement Units



### 2-14 Computer Storage Capacity Measurement Units

The smallest unit for storing data in a computer is the byte and consists of 8 bits. One bit is either zero or one. Table 2 -8 shows some data representation units.

Unit	Volume
Bit	0.1 (the smallest unit to represent data)
Byte	8 Bit or icon
KB	1024 bytes
MB	1024 KB
GB	1024 MB
TB	1024 GB

Table 28-: Some data representation units

#### Storing data in memory

- Bit: the smallest unit representing 0 or 1.
- Character: A letter, number, or symbol, represented by Byte.
- Field: A character or character set representing a specific statement
- Record: A field or group of fields.
- File A recordset.
- Data Base: A set of related and organized files without duplicating data.

**Example 13:** An external hard disk with a capacity of 1TB, how much its capacity is equal in:

- 1- Bit
- 2- Byte
- 3- KB
- 4- MB
- 5- GB

**Solution:**

1.	$1\text{TB} = 1024 * 1024 * 1024 * 1024 * 8 = 8 * 10^{12} \text{ BIT}$
2.	$1\text{TB} = 1024 * 1024 * 1024 * 1024 = 1,099,511,627,776 \text{ B} = 10^{12} \text{ B}$
3.	$1\text{TB} = 1024 * 1024 * 1024 = 1,073,741,824 \text{KB} = 10^9 \text{ KB}$
4.	$1\text{TB} = 1024 * 1024 = 1,048,576 \text{ MB} = 10^6 \text{ MB}$
5.	$1\text{TB} = 1024 \text{GB} = 10^3 \text{ GB}$

**Example 14:** A computer with a memory capacity of 24117248 KB, calculates the capacity of gigabytes.

**Solution:**

$$24117248 / 1024 = 23552 \text{ MB}$$

$$23552 \text{ MB} = 23 \text{ GB}$$

**Example 15:** Convert to KB:

- 1. 1 terabyte.
- 2. 60 GB.

**Solution:**

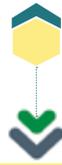
$$1. 1024 * 1024 * 1024 = 1,073,741,824 \text{ B} = 10^9 \text{ KB}$$

$$2. 60 * 1024 * 1024 = 60 * 1,048,576 \text{ B} = 60 * 10^6 \text{ B}$$









## *Computer Software*

### Objectives

#### ➔ **Main objectives:**

1. Learn about operating system software.
2. Learn about the utility software.
3. Learn about programming languages.
4. Learn about application software.

#### ➔ **Sub-Objectives**

After studying this chapter, the student is expected to master the following knowledge and skills:

1. Distinguish between different types of software.
2. Differentiate between types of system software.
3. Distinguish between types of operating systems.
4. Count the basic functions of the operating system.
5. Learn about different types of utility software.
6. Learn about the most important utility software and its functions.
7. Distinguish between different types of programming languages.
8. Differentiate between the types of different programming languages compilers.
9. Classifies different programming languages
10. Classifies application software.
11. Learn about the most important application software

### 3 -1 Introduction to software

The beginning of programming languages was before the manufacture of computers, they were small codes. In 1801, the scientist Joseph-Mary Jacquard invented the mechanical knitting machine, which was programmed and controlled by means of Punched Cards. These cards contain a set of holes representing the program. The British scientist Charles Babbage then used these cards in making the first mechanical computer. He called it the analytical machine in 1820 and the American scientist Herman Hollerith invented a census-based machine with these cards.

The term “software”, however, dates back to 1958 at the hands of scientist John W. Toke from Princeton University. At that time, most of programmers were women and were among the best university graduates who had been recruited, as men were preoccupied with war. The most famous one was Grace Murray Hopper, a mathematician who joined the US Naval Reserve during the war. She was credited with the appearance of the translator's repairman. Thereafter, the punch card technology continued to be used in programming until 1960, when the first high-level programming languages, Cobol and Fortran, appeared. The C languages, Prolog, and SQL then appeared in 1972. Not long after, Basic, which became one of the most popular programming languages, which was used in schools and universities in 1974. The language of C++ was developed in 1983. As for the Visual Basic and Python languages were in 1991, while Java and JavaScript were in 1995. In 2000, C-Sharp and Visual Basic.net appeared.

The period 1970-1980- witnessed major development in operating systems. The Unix operating system appeared in 1970 and still under development. DOS-11 appeared for personal computers in 1974, Apple DOS in 1978, Windows 1.0 in 1985, Linux in 2003, Windows Vista in 2007, Android in 2008, and Windows 8 in 2012.

As for databases dating back to 1963, IBM developed a system for dealing with databases for NASA. In 1970, the so-called Relational Data Model (RDBMS) emerged and was used in bank customer data. Then SQL, the standard language for querying, appeared in the relational data model by IBM. Then a group of companies specialized in databases such as Oracle and Informix appeared. Then Microsoft appeared through Access, which relied the SQL database management system and became one of the most famous database systems. With respect to the electronic tables, it made its first appearance in 1979. The Lotus 123 program from IBM then appeared, and then the Microsoft Excel program did.

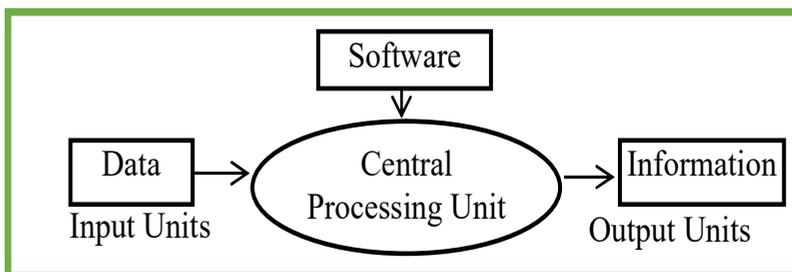
For word processors, the beginning was in 1976 by the electric pencil word processor from IBM, followed by the program of the writer from Apple Writer in 1978. In 1979, the most famous word processing program WordStar emerged and became very popular. The Microsoft Office appeared in 1990.

**Skill 3 - 1**  
What is a software?



Software definition: it is a set of commands and instructions written in one of the special computer languages (programming languages), which directs the computer to implement a set of steps to solve a specific problem or implement a specific task.

The hardware does not work without the software. The software directs the CPU to receive data from the different input units, perform the required operations on them, and output the results and information to the different output units, as shown in Figure (3 -1).



**Figure 3-1:**  
The role of software in operating the computer

The software represents the link between the human and the computer. There are now millions of software. So, due to its importance in our daily life and its rapid spread, in this chapter we will have a look at the software and its different types, with mentioning some examples.

**Skill 3 - 2**  
The ability to classify software.



**3- 2 Types of software**

The software can be classified as ownership, license, or use.

**31-2- Types of software in terms of ownership and licensing**

Software can be classified in terms of ownership and licensing into four types as shown in Table 3 -1.

Table 3 -1 Software Types of Ownership and License

Type	Description
Closed Source Software	It is non-free software and licensed under the law of protecting intellectual property by preventing copying, printing, publishing and amending. So, the licensee is only entitled to use, while Source Code is not provided, such as Microsoft Corporation (Windows, Office,..).
Opened Source Software	It is software that allows the addition and modification to source code, which is available with this software. This type of software is not for profit and developed by a group of volunteer programmers, such as Shotcut video editing software and LibreOffice application package similar to Microsoft Office.
Shareware	It is software that allows free use for a specific trial period. After the end of the period, the trial program will either stop working completely or partially, or start sending spam to the user; for example, Adobe Photoshop 8 and WinZip.
Freeware	It is software that allows free copying, downloading and distribution. They are often from non-profit organizations such as universities; for example, Filzip and Mp3tag.

**3 -2 -2 Types of software in terms of use**

Software is divided in terms of use into three basic types, as shown in Figure (2 -3).

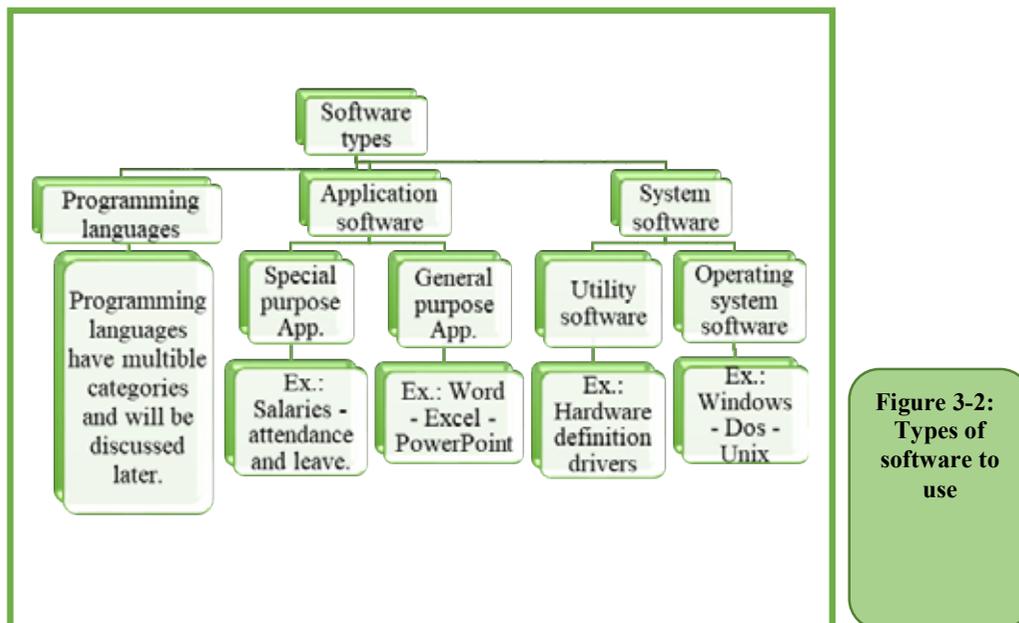


Figure 3-2: Types of software to use

Below are the detail of these types.

**Skill 3 - 3**  
Distinguishing between types of systems softwares.



### 3 -3 Systems software

Systems software definition: It is a set of software that controls the operation and management of computers, peripherals and other programs efficiently and easily, and takes advantage of all components to implement the needs of the user.

It is developed by computer manufacturers or other international companies. Systems software can be divided into two types:-

- Operating System Software
- Utility Software

These types are explained below.

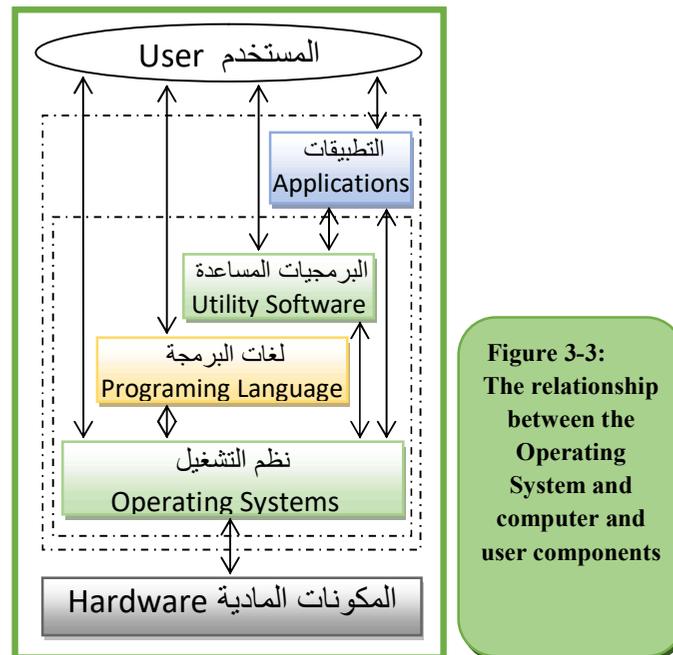
**Skill 3 - 4**  
Learning about the operating system and enumerating some of its basic functions.



#### 3 -3 -1 Operating systems

One of the most important basic software that a computer needs in order to operate is the Operating System (OS).

Operating system definition: A set of programs responsible for operating and managing all computers and physical components of the computer, as well as providing an interface (communication) between the user and these components. The operating system can be considered the general manager of the computer. It receives data and commands from the user or from other software and then stores them temporarily and sends them to the processor for processing and implementation, and then takes the results from the processor and sends them to storage units or to different output units. Without the operating system, the computer stops working completely. Figure (3- 3) shows the relationship among the operating system, computer, user software, and components.



### *First: the basic functions of the Operating System*

The operating system has many functions, including: -

- **Operating the computer:** once the computer is started, the operating system loads most of its commands and functions to the Random Access Memory(RAM), which starts automatically by receiving commands, operating and managing the hardware and software components.It continues to work within memory until the moment of closure.
- **User Interface:** it is an interactive interface between the user and the computer hardware and software components.
- **Operations Management:** the operating system, through managing operations, performs many tasks, including: starting or stopping the execution of the process, and maintaining the sequence of operations that the user needs from its beginning to its end.
- **Input and output management:** this function includes many tasks, including: Providing access to input and output units when needed.
- **Memory management:** the operating system, through memory management, performs many tasks, including: knowing the portion of the memory used by whom of the users and from which program, allocating the required space from the memory to implement other programs, freeing the memory after completing the implementation of the software to use it

again, and the optimal use of memory and utilizing it.

- **Processor management:** through this function, the operating system performs many tasks, including: allocating the processor or processors to perform the required tasks, scheduling tasks, setting and implementing priorities for the various operations, knowing the status of the operations that the processor performs and managing, and canceling the assignment of the processor when not needed.
- **Manage peripherals attached to the computer:** printer, scanner, modem, etc. These devices are managed through many tasks, including: checking and knowing all the devices connected to the computer, operating these devices and optimal coordination among them, allocating the operations that these devices will implement, and canceling the allocation after implementation.
- **File management:** file management is done through many tasks performed by the operating system such as: tracking files and knowing where to store and use them, Providing many operations such as copying, saving, opening, etc, and Knowing the software that you can run and benefit from.
- **Run other software** and link it to the user and computer components.
- **Securing and protecting data and software:** such as creating a username and password to protect the device, software and data; from who are not authorized to interact with the device.
- **Operation control:** operation is monitored through several tasks, including: determining the time between service request and hardware implementation, identifying the users of devices from both users and programs, and providing the user with reports on the operation of programs and data he uses.
- **System maintenance:** it is done through many procedures, including: detecting some errors as they happen, sending messages to the user or the system administrator to clarify the problem, and help with the solution.



**Skill 3 - 5**  
Distinguish among types of operating systems.



**Second: types of Operating Systems**

There are many operating systems that differ from each other as a result of many factors, including: the difference of the producing company - the type of computer - the ability to run more than one program or process at the same time or not - the possibility of participation of a number of users or not and other factors. Therefore, there are many classifications of operating systems among them, examples are as in Table 3- 2.

**Table 32- Types of Operating Systems**

Classification	Description
Use and Ownership License	Free operating systems such as: Linux, Ubuntu.
	Non-free operating systems such as Windows, Mac.
Running more than one program or function	Single-Tasking systems perform one task as running one program at the same time as DOS.
	Multitasking: this type can run multiple applications or execute multiple orders at the same time using the Time-Sharing method. These systems are the most used now.
Run and manage more than one processor	Single-Processing operating system such as operating systems for personal computers and smart devices
	Multiprocessing system: this system allows us to run more than one processor and coordinate between them at the same time as operating systems of supercomputers and mainframes(SUN OS).
One user or more are working	Single-User systems
	Multi-User systems
The type of computer in terms of size and use	Personal computer operating systems
	Servers operating systems and large devices
	Operating systems of small devices and smartphones

From the above one can conclude that there are many types of operating systems, including: -

**1. Single-User Single-Task Systems**

This system allows one user to run one program or perform one operation at the same time. If the user wants to run another program, the first program

must be closed. For example, the DOS Operating System which is one of the oldest operating systems.

### **2. Single-User Multi-Task Systems**

These systems allow one user to run more than one program at the same time, navigate and share data between them. These systems are the most used now, especially on personal computers and workstations, such as Windows and Mac OS.

### **3. Multi-User Single-Task Systems**

These systems allow more than one user to run each of them one program at the same time or everyone to share only one program. These systems are used with mainframes or servers, and each user has an input unit (keyboard and mouse) and an output unit (screen). This system is based on time-sharing on users such as Windows NT. These systems are characterized by the ease and speed of data modification and protection, and users benefit from dealing with very fast devices. However, one of its disadvantages is that if the central computer or the server crashes, users stop working permanently, and the speed decreases as the number of users increases.

### **4. Multi-user Multi-Task Systems**

These systems allow more than one user to run and execute more than one process at the same time. It is the most powerful operating system available and used in supercomputers, central and medium computers. It is characterized by the participation of users of all components of the computer at the same time as the Unix operating system.

### **5. Real-Time Systems**

Real-time operating systems are distinguished from other systems by high speed (measured in microseconds or part thereof) in receiving data and performing the required tasks. It is used in applications where the time factor is very influential and may contain functions specific to the application or the field used in it. These systems have become used in many fields, including medical, industrial, scientific, airport control, and robotics as a result of the rapid and significant development of communications technology and automatic control. Its disadvantage is that it is expensive.

### **6. Network Operating Systems**

Network operating systems are distinguished from other operating systems because they allow the management and sharing of networked devices, data, information, and programs to protect them from intrusion and others, as well

as easy and fast access to the server or other devices. However, one of its disadvantages is the high cost of purchasing, operating, and maintaining the server; besides the server failure causes most of the network operations to stop. Examples of network operating systems include Microsoft Windows Server 2012, Unix, and Novell.

### **7. Distributed Operating System**

Distributed operating systems work with multiple central or independent processors, where they manage these wizards, coordinate, and distribute tasks and operations among them. Also, they are characterized by high speed and efficiency as a result of assigning tasks to processors; and if a malfunction occurs in one of the processors, it does not affect the rest. One of its drawbacks is that it is very expensive.

### **8. Mobile and Smart Devices Operating System**

These systems feature the provision of many services and applications such as calls, calls over the Internet, video calls, voice messages, web browser, e-mail, music player, support for social networking programs, and others.

#### **Skill 3 - 6**

Learn about some of the most popular Operating Systems.



### **Third: examples of Operating Systems**

Currently, there are many operating systems, as mentioned before, some of which are for a personal computer, some are for networks, and some are for smart devices and smartphones. The most popular operating systems are Windows, Linux, Mac, Unix, Android, iPhone, and Windows Phone.

#### **1. Windows**

Windows operating systems have become the most widespread and used around the world because of its easy, simple, and multifunctional graphical user interface, as well as it supports running most applications and video games. However, one of its drawbacks is that it is not free. In this book, we will study Windows 10 OS.

#### **2. DOS**

One of the first personal computer operating systems to work on IBM devices and Intel processors, which is an acronym for Disk Operating System. It emerged in 1981. It has the advantage that it allows the user to deal directly with computer components. Among its disadvantages is that it is a single-user single-task

operating system, and also uses the linear interface method via the command page and keyboard, which results in many errors.

### 3. Mac

Mac OS is designed to deal with Apple Macs, as Apple produced it in 1984 to deal only with its devices, but recent versions such as 8 and 9 can run applications and programs compatible with DOS and Windows. It is the first operating system to provide a graphical user interface with full support for the Arabic language. It is the most powerful operating system that supports printing and desktop publishing services.

### 4. Linux

The Linux operating system, LINUX, is one of the most popular systems around the world. It is an open-source system with an easy graphical interface in most languages of the world, and it depends on the Linux operating system which is similar to it. The first version of Linux was in 1992, then various versions rolled out; the latest version was Linux3.9.6. It works on all types of computers (supercomputer, mainframe, central, personal, networks and smartphone devices). It is usually used in distributed systems networks. Its logo is the penguin.

### 5. Android

It is a special operating system for smart devices and tablets and is based on the Linux operating system. It was developed by a number of companies such as Google and others. The first release was Android1.0 in 2008. The latest release is now Android4.2.2.

### 6. IOS

An operating system for Apple mobile phones and devices, which is a multitasking operating systems. The current version is 7.

#### Skill 3 - 7

Learn about the utility software with some examples.



### 3 -3 -2 Utility Software

Definition of Utility Software: It is a set of accompanying and auxiliary software for the operating system that helps and facilitates dealing with the computer, its hardware and software components, managing and increasing the efficiency of its operation. They are user and system service programs.

***There are many utility programs and can be divided into two parts: -***

- Utility software that comes within the operating system, such as the set of programs in a window or Control Panel within the Windows operating system (Ex.: search for files, view pictures, backup files, manage disk, and attached devices to the computer, etc.). This software is sometimes called utility tools.
- Software purchased separately and installed on the device.

***Below we will review some of this utility software.***

***1. Anti-Virus / Firewall***

Definition of Anti-Virus Software: they are programs used to detect and remove harmful viruses and malware from the computer, as well as to protect from them and prevent their infiltration into the computer. There are many and varied programs used in this field, including:- antivirus programs, such as Norton 360 and Microsoft Defender; antispyware programs, such as Spyware Doctor; Intrusion prevention programs, and data and hardware protection, such as Firewall.

We will explain in detail in a next chapter methods of data security and protection, as well as types of viruses and malware, and how to use Microsoft Defender.

***2. Uninstall Programs***

Definition of Uninstallation Software: It is software used to completely remove a program on a computer and all files and data related to it from the device. It is one of the utility software that comes within the operating system.

There are also other programs that can be purchased and installed on the device that remove the software and clean the device from unimportant and neglected programs (Uninstall and Clean Programs) such as CCleaner or Tune-up Disk Cleaner.

***3. Device Drivers***

All devices or units that are connected to the computer (such as the printer, sound card, CD player, and scanner) must be defined for the device: its type, how to operate it, manage it, and everything related to it. This is done through the program of identification and management of the device that often comes with the device, at the time it is bought, or downloading it from the internet. This program is installed on a computer once when the device is first used. Modern versions now contain a number of device drivers for popular accessories.

#### 4. File Compression Programs

This software is used to reduce the size of files when they are stored (to provide the required storage space) or when sending files. Some times, large files are difficult to send and require compression first. There are many programs used for such purposes, such as WinZip for Windows or DMG for Mac. This software compresses files in various formats to reduce their size. These compressed files are used only after decompressing with the help of this software again.

#### Skill 3 - 8

Learn about programming languages.



### 3 -4 Programming languages

As mentioned earlier, the computer only deals with the machine language (a set of digital codes consisting of zero and one). This was the first language in which a person dealing with a computer. The machine language was complicated and difficult to use, so a number of Programming languages were developed for dealing with computers.

**Definition of the programming language:** It is a set of symbols, signs, special words, or reserved words and the rules for communicating with the computer.

Each programming language has its own program that translates everything written in this language (Source Code) to the machine language for the computer to understand and implement. The programmer writes his program using this language with a text editor program (some languages have its own editor such as C ++, and some use any general editor such as HTML). Next, the compiler or interpreter program is used to convert it into machine language code; called the Executable Code, to be executed at any time.

#### Skill 3 - 9

Distinguishing types of programming languages  
compilation programs.



### 31-4- Types of Programming Languages Compilation Programs

#### 1. Compiler

Compiler: a program that translates the source program into a program in machine language at once provided that there are no spelling or grammatical errors in the language in the source program as in Figure 3 -4.

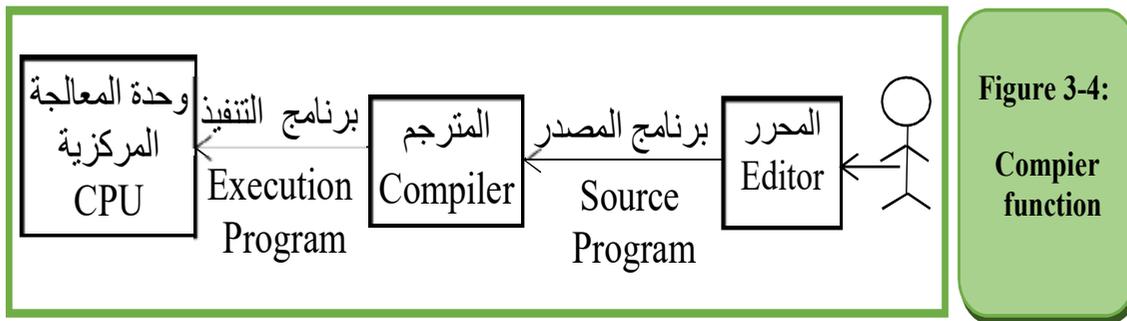


Figure 3-4:  
Compiler function

### 2. Interpreter

Definition of the interpreter: it is a program that translates the source program sentence by sentence to be executable and executes it, then the following sentence, and so on to the end of the program as in Figure 3 -5.

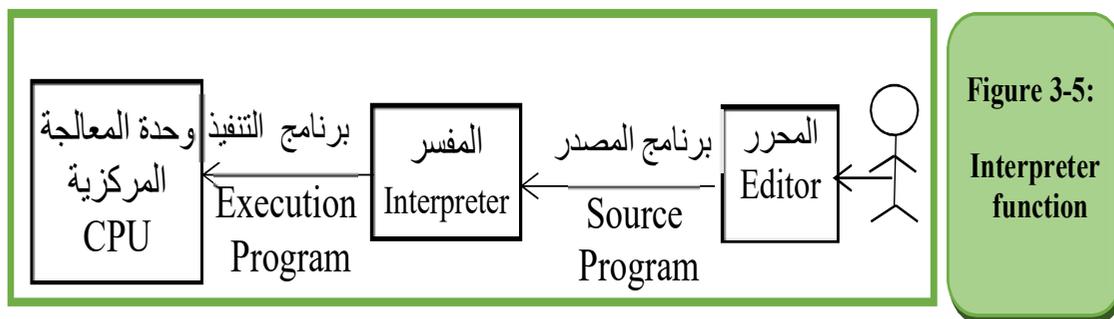


Figure 3-5:  
Interpreter function

### 3. Assembler

**The assembler:** it works in the same way that the interpreter works, except that it is for translating and implementing programs written in the assembly language only, which is one of the low-level programming languages.

There are a number of common functions between the compiler and the interpreter program, including:

- Ensure that the source program is free of spelling and grammatical errors.
- Converting the error-free source program to a program written in machine language.

#### Skill 3 - 10

The ability to classify programming languages.



#### 3- 4 - 2 Classifications of programming languages

There is no specific or approved classification for programming languages, but there are several classifications depending on the method of implementation or the proximity and distance from the human language, use, or other factors:

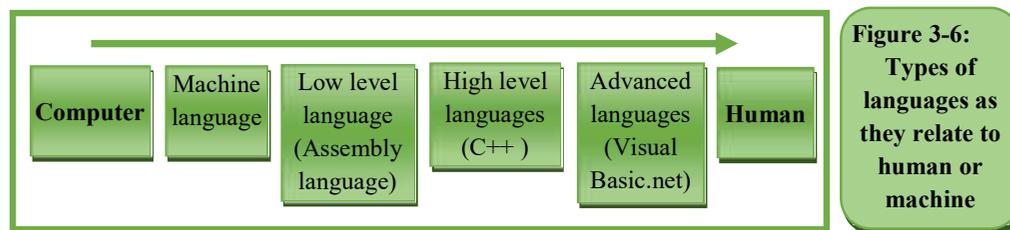
**First: According to the method of implementation**

Programming languages are divided into languages that use: -

1. Assembler, it is only one language; the assembly language
2. Interpreter, such as Basic
3. Compiler, such as C ++
4. Compilers and interpreters together, such as C #.

**Second: in terms of its proximity to human language or machine language.**

It is divided into four sections as in Figure 3 -6:



**1. Machine Language**

A numerical code consisting of a set of zero and one is used to express commands, inputs, and outputs. It is implemented directly by the processor and does not require translation. It is the first programming language to emerge. This language appeared before the computer itself.

Advantages: it works at a very high speed because it is a language that the machine understands directly and does not need a translation.

Disadvantages: it depends on the type of processor and its internal structure; the extreme difficulty in dealing with it in terms of writing, error detection, and correction, as well as the difficulty of modification, especially for non-specialists.

**2. Low-Level Language**

It is far from the human language and is somewhat close to machine language, such as the assembly language or symbols, which is a development of machine language.

Advantages: directly access and deal with hardware; speed of execution, and therefore it is still used so far in real-time and control applications; and does not need a computer with high specifications.

**Disadvantages:**

- A language that depends on processor type, so:
  - A program written on a device may not work in another device.
  - The programmer should know the internal structure of the processing unit and how it works.
- Difficulty to deal with it (writing, understanding, and modifying the program) because it uses symbols.
- The programmer needs to write a number of instructions to do a simple command.
- The programming error may damage the device because it deals directly with the hardware.

**3. High-Level Language**

Languages close to the human language, as they use the vocabulary of the human language and the arithmetic and logical symbols. Therefore, a non-specialist can read and understand a large part of it, such as C, Basic, and C ++.

**Advantages:**

- Ease of writing, reviewing, understanding, and modifying programs.
- Does not require familiarity with the internal CPU installation or how it works.

**Disadvantages:**

- It needs special specifications of the computer in terms of processor speed and memory.
- Slower execution than machine language or low-level languages.

**4. Advanced Level Language**

There are two types of advanced languages: -

1. Visual programming languages: languages with graphical environments, where the programmer selects the formats it needs to create its program. The language then directly writes the code. Thus, it is possible to make a complete program without writing any code, such as Visual Basic.
2. Descriptive programming languages: Languages that ask the user to describe what he wants from the program and the required result without exposure to the steps necessary to achieve the required, such as languages that deal with databases (SQL query language) and the Internet programming language HTML.

**Advantages:**

- The closest languages to a natural human language.
- Lack of written code compared to the previous types
- Easy to learn and understand from non-specialists.
- Disadvantages:
- It needs special specifications of the computer in terms of processor speed and memory.
- Slower execution than previous languages.

**Third: in terms of usage, it is divided into:**

1. General usage languages: used to write all kinds of programs and applications, such as C and Java.
2. Special languages such as Internet programming languages HTML and PHP, and database programming languages SQL and others.

**Skill 3 - 11**

Learn about application software.

**3 -5 Application software**

Man now uses computers in all aspects of life (scientific, social, practical, entertainment, and others) through a set of ready-made software called the Application Software.

Definition of application software: It is a group of programs that help the user to accomplish specific useful tasks.

Application software is divided into general-purpose application software and special-purpose application software. Below we will explain these two types.

**Skill 3 - 12**

Distinguish between general-purpose application types.

**3 -5 -1 General purpose application software**

Definition of general-purpose application software: it is a set of programs that help the user by providing a set of ready-to-use tools to implement what he wants.

**There are several pictures of general-purpose application software:**

- A small program that is used to help carry out a specific task such as a web browser program.

- A group of small programs that are linked together to perform a specific task, such as antivirus software
- A set of independent programs (called a software package) to perform a set of different tasks. Each program can be used separately to perform a specific task. More than one program can also be used to perform a set of joint and integrated operations on data, such as the Microsoft Office suite (consisting of a word processing program, electronic tables program, slide viewer, etc.).

Table 33- shows some general-purpose applications.

**Table 33- Some uses of general-purpose applications**

<b>Application</b>	<b>Use</b>
Word Processor	Editing and formatting documents, reports, notes, and letters with the ability to spell check and insert tables, pictures, and graphics, such as MS-Word 2016.
Spreadsheets	Entering digital data in the form of tables and performing many mathematical, statistical, logical, and other operations on this data, and then displaying it in the form of graphics, shapes, and charts, such as MS-Excel 2016.
Presentation	Create presentations and explanations in the form of a set of slides with the ability to add multimedia in the slide as well as sound and animation effects on the view, such as MS-PowerPoint 2016.
Database Management	Storing data in a tabular form and performing many operations on it, such as adding, deleting, modifying, searching, and browsing with ease and high speed, such as MS-Access 2016.
Internet Application	Internet browser software is used to browse different pages and sites on the Internet, such as Google Chrome, page and website creation programs, and others.
Graphics	Programs for designing, editing, and editing graphics and images, such as Adobe Photoshop and 3D Studio.
Education Learning	There are now many educational programs that are used in all fields and levels of education (pre-school - school - university - after university or continuing education). It is available through a set of discs or programs that can be downloaded from the Internet or subscribed directly through the Internet (via distance education).

**Skill 3 - 13**

Learn the features of general-purpose application software.

**General-purpose application software has many advantages, including:**

- Ease of use because it contains more than one mean of help (graphical user interface, Help service, communication and technical support via e-mail, and others).
- Somewhat cheap compared to special-purpose applications.
- Many programs are available to perform the same purpose (such as the application of electronic tables processing, there are Excel and Lotus 123 ...).
- Increased reliability because these apps have already been tested and used.

**The general purpose application software has some disadvantages, including:**

- It may need a lot of storage space.
- The user's needs may not be 100% met, but in this case, more than one application is used.

**Skill 3 - 14**

Learn the features of special purpose application software.

**3-5-2 Special purpose application software**

This type of application software is designed and built to carry out specific tasks and is used only for the purpose for which it was designed. They are programs designed according to the request and needs of the user. Examples are library management software, pharmacy management, accounts, and inventory or corporate personnel management, payroll, flight reservations and ticket management, and many more.

**Characteristics of application software for special purposes:**

- Ease of use because it is custom-made.
- Small in size because it carries out specific and special tasks.
- Executes required operations and tasks with high speed and accuracy.

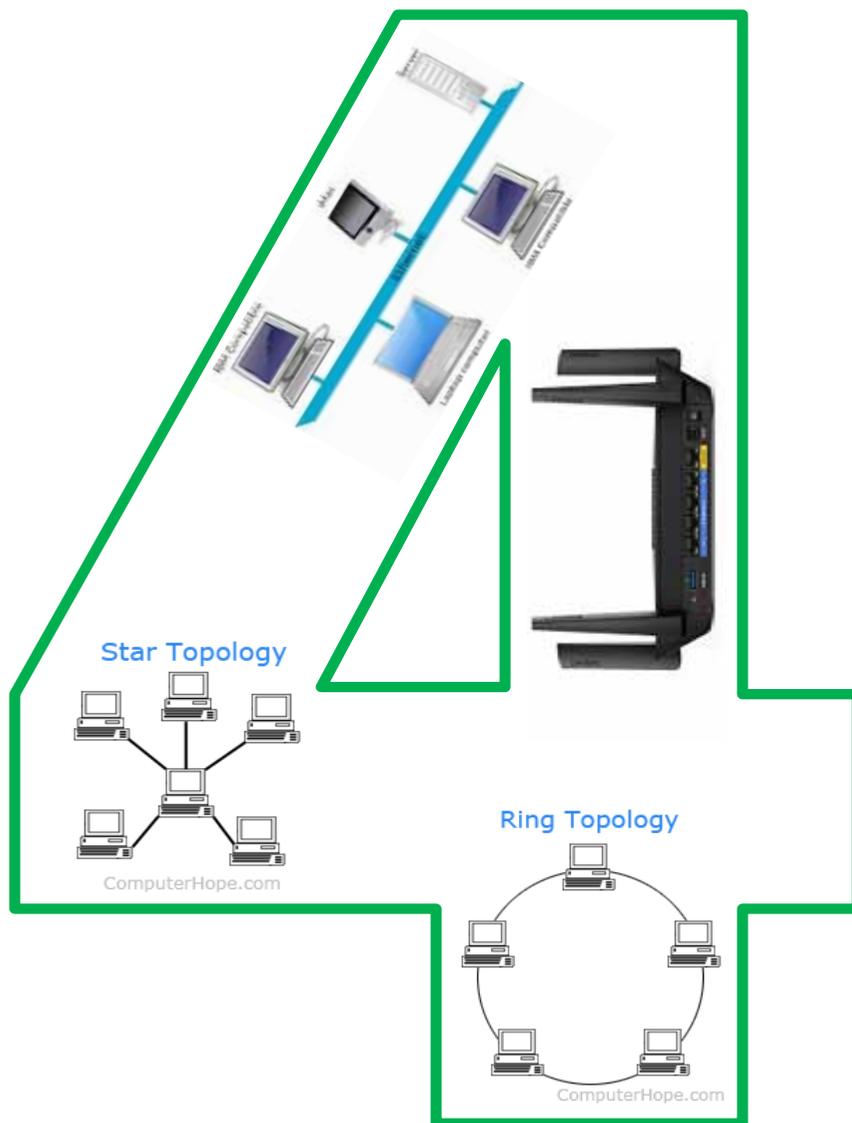
**The special-purposes application software also has some disadvantages, including:**

- It is very expensive because it is specially designed for a specific purpose (according to the user's request).
- It must be tested in practice first before use.
- It may take time to design and implement it.



# Chapter 4

## Computer Networks and Internet







## Computer networks and internet

### Objectives

#### ➔ Main objectives:

1. Learn how to communicate between more than one computer through different types of networks.
2. Distinguishing between the Internet and the World Wide Web.

#### ➔ Sub-Objectives

After studying this semester, the student is expected to master the following knowledge and skills:

1. Defines the computer network and enumerates its benefits.
2. Distinguishes between different types of networks.
3. Enumerates the basic components for building a local network and factors that influence their choice.
4. Distinguishes between the Internet and the Web (www).
5. Distinguish between the web page and the site and how some different sites are categorized
6. Enumerates some of the basic features, functions and services of the Internet
7. Explains the types of internet connection lines.
8. Enumerates some types of Internet servers.
9. The Protocol is known and enumerates some of its types.
10. Defines search tools and distinguishes among its different types.
11. Recognizes search engine components.
12. Distinguishes between online search methods.
13. Recognizes the inclusion of shapes and symbols.
14. Master the insertion processes of Tables

## 4- 1 Networks Introduction

Computer networks have gone through many stages of development until they have reached what we are witnessing now, and are still evolving in terms of speed and proliferation and technology used in the hardware industry, data transfer and others. The idea of networks began in 1934 when the Belgian scientist Paul Oatley thought about collecting all information and disseminating it around the world through search engines and hyperlinks. Then, in 1940, the scientist George Stepittens was able to send a set of instructions to solve a matter from Dartmouth College by means of a teletype machine to a complex calculator in New York and then receive the results. In 1950, networks emerged by linking a set of computers to military radars (SAGE). SABRE then emerged by connecting two central computers in 1960. In 1964, the "SPARE" system for booking American Airlines tickets by IBM was introduced by IBM by connecting a group of computers estimated at 2,000 terminals in 65 cities with two concentrated IBM 7090 devices by telephone lines. In 1965 the first Wide Area Network (WAN) was introduced by the scientist Tomahas Marial. In 1969, four hosts were connected together as the beginning of the emergence of the ARPANET network at the end of 1971 Dennis C. Hayes invented the electronic mail. In 1973, the FTP was introduced and electronic communication was made among the University of London in England, the Royal Radar Foundation in England and the ARPANET American network. Dennis C. Hayes has invented a computer modem in 1977. In 1980, Novell Company announced a software system for personal computers, which led to a rapid development of local networks. In 1982 TCP/IP and Domain Name has appeared as gov and edu. In 1990, the language of the Hypertext Markup Language (HTML) appeared as a starting point for the World Wide Web. In 1996, the scientist Brantt invented a 56-kilobyte modem. In 2005, cloud computing technology emerged, fiber optics emerged in 2011, and Wi-Fi in 2014. The development of computer networks continues to increase day by day to bring in new services, improve existing services, address existing problems, as well as improve performance, speed and security for users of networks around the world.

### Skill 4 - 1 knowing Computer Network



Computer network definition: Is a group of computers and other devices connected to each other to share resources (hardware and software) and exchange and transfer data and information.

Figure 4.1 gives an example of a small network made up of a number of computers and accessories (printer and scanner) and a device to connect network components and lines of communication.

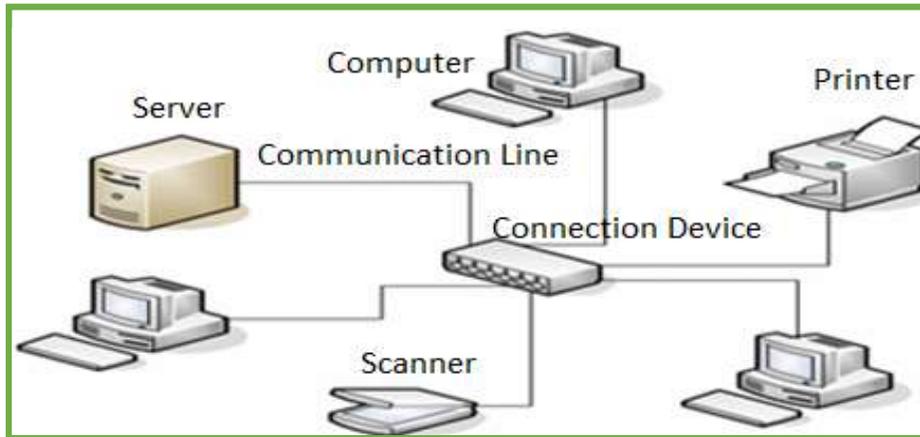


Figure 4-1  
Simple  
Model for  
Computer  
Network

### Skill 4 - 2

Ability to count some Importance of Computer Networks for users



## 4- 2 Network Importance

*There are many benefits for computer network users, including:*

- Share programs, data and information.
- Device sharing: such as printer, scanner, storage devices, etc.
- The possibility of expanding the area covered by the network and increasing the number of computers and other devices at the lowest cost.
- The ability to communicate and exchange messages and files between users via email. Saving time, effort and money in data transfer
- The ability to centralize the network by the network administrator, which eases the burden of solving problems on users.

### Skill 4 - 3

The ability to Classify Networks



## 4 -3 Networks Types

*Computer networks can be classified on the basis of several factors, including:*

- Geographic network coverage
- How to connect network components together
- Network devices communication method
- The type of media, as shown in the figure (4- 2).

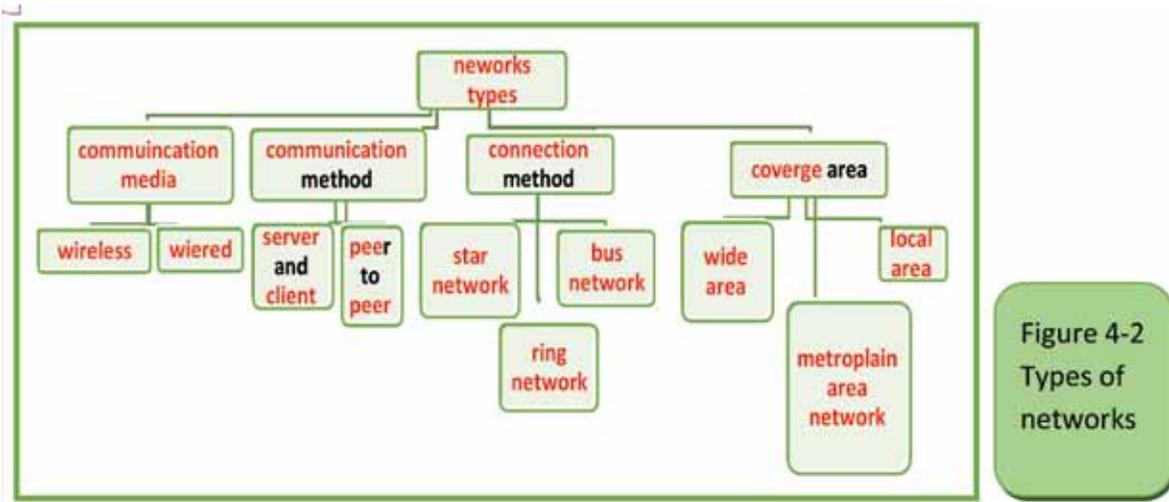


Figure 4-2  
Types of networks

**Skill 4 - 4**  
The ability to classify networks in terms of geographic coverage area



### 4 -3 -1 NetworksTypes According to the Geographic Coverage Area

Computer networks are divided according to the area they cover or the geographical extension they cover into three types:

**Skill 4 - 5**  
Identify the local Area Network and mention its characteristics.



#### **First: Local Area Network (LAN)**

Local Area Network definition: - A computer network that is used within a specific area (a floor in a building or a building or several adjacent buildings). Figure (4 -3) gives an example of a small local network within an office or laboratory.

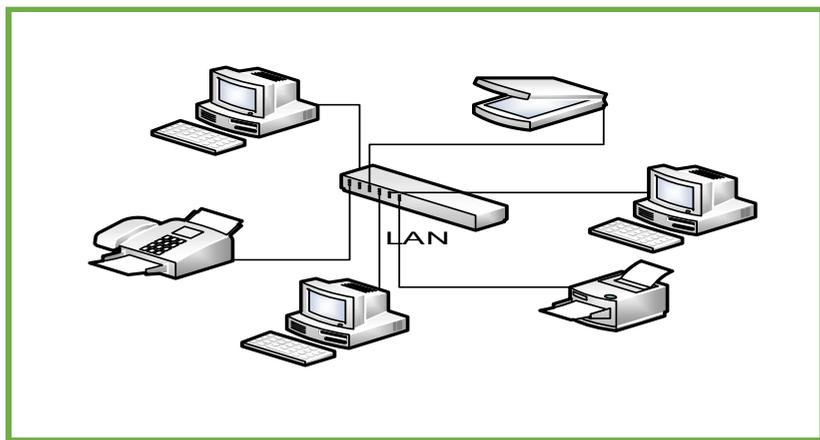


Figure 4-3  
Local Area Network model

**Local Area Network attributes**

- Used in a limited space such as one or two adjacent buildings up to 2000 meters
- For a single company or organization
- Number of computers from (2) to about 500
- High speed from 4 Mbps to 1000 Mbps.
- High efficiency because it is a limited network in terms of the number of devices, space and software.
- Low cost because it does not require expensive hardware, software and transportation.

**Skill 4 - 6**

Identify the Metropolitan Area Network and mention its characteristics



**Second:Metropolitan Area Network (MAN):**

Metropolitan Area Network definition: A computer network that is used within an entire city or two adjacent cities. It consists of a number of local networks connected to each other as in the figure (4 -4). It may be used fiber optic in connecting this type of network.

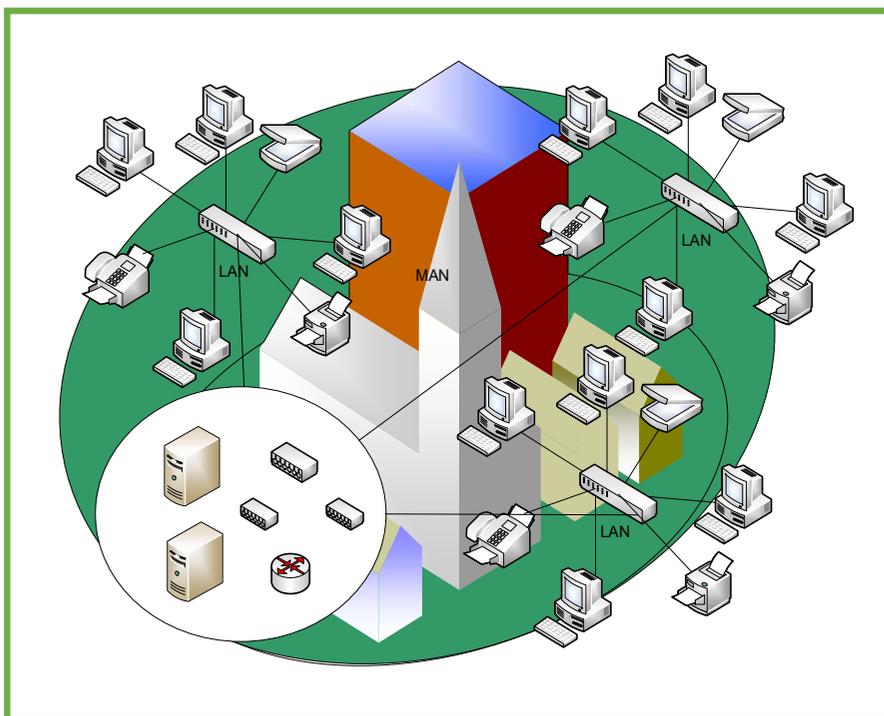


Figure 4-4  
Metropolitan  
Area  
Network  
model

**Metropolitan Area Network attributes:**

- Used at the level of one or two neighboring cities
- For an institution or a number of institutions.
- The number of computers is about a few thousand
- Consists of a number of local networks
- Speed is relatively slower than local networks and relatively faster than broadband.
- Efficiency is lower than the LAN because it uses more devices and longer distances.
- Higher cost than local networks

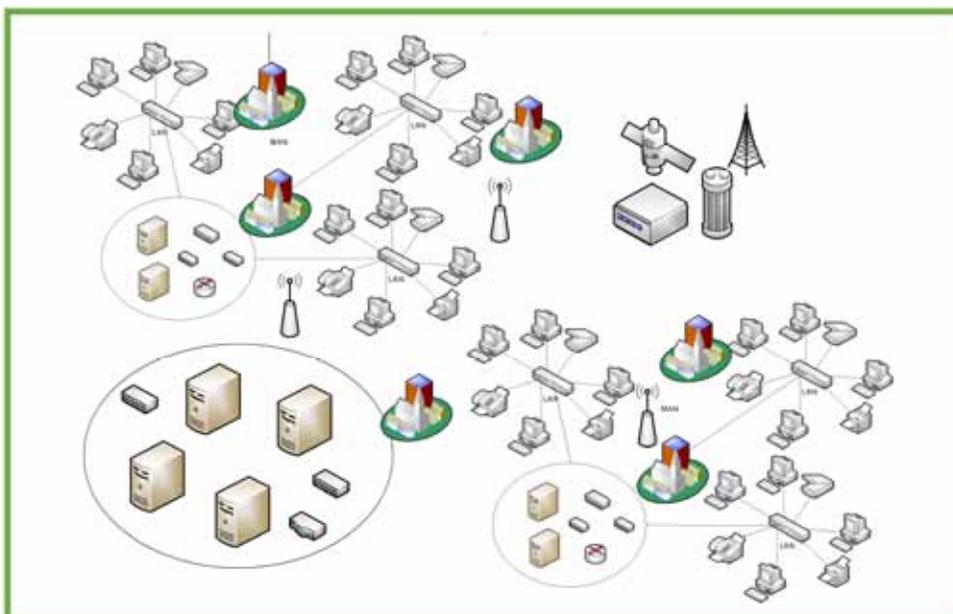
**Skill 4 - 7**

Recognize the wide network and mention its characteristics.



**Third Wide Area Network (WAN)**

Wide Area Network definition: It is a network that spans a wide geographical area or across continents that allows the exchange of data and information across countries and continents between network users. It consists of a number of Metropolitan Area Networks as in the figure (4- 5).



**Figure 4-5  
Wide Area  
Network  
model**

**WideArea Network attributes**

- Used at the level of one or several countries, they are the largest networks.
- For an institution or a number of institutions.
- The number of computers is very large.
- Consists of a number of regional networks.
- Speed is relatively slower than other networks.
- Less efficiency than other networks.
- Cost is higher than other networks

**Skill 4 - 8**  
Comparison of network types according to terms of area. 

From the above it is clear that there are many differences between network types according to terms of area. Table 4.1 shows some of these differences.

Comparison Factor	Local Area Network	Metropolitan Area Network	Wide Area Network
area	Limited area	One or more adjacent cities	Large area across countries and continents
speed	High	medium	Varied
No. of users	Small	big	Huge
construction	A group of computers, accessories and other devices	A group of local networks	A group of Metropolitan Area Network
cost	Lowest cost	More cost than local	The highest cost

**Skill 4 - 9**  
The ability to categorize networks in terms of communication media. 

**4 -3- 2 Types of networks in terms of communication media.**

Communication Media definition: These are the means used to connect devices connected to the network with each other and through them the data are transferred. Networks in terms of the type of communication media are divided into wired networks and wireless networks as shown in figure 4 -6.

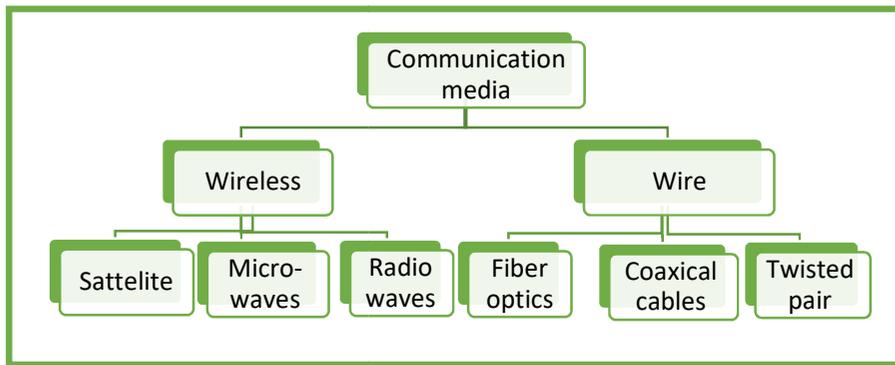


Figure 4-6  
Communication media types

**Skill 4 - 10**  
Identify wired communication media and distinguish its types.



The following is an explanation of each of them:

**First: wired networks**

These networks rely on the use of wires to transmit data and communicate between users and devices. There are many types of wired media, so-called wires or cables (Wired Data Transmission Media). Some of the most famous of these types are:

- Twisted Pairs.
- Coaxial Cables.
- Fiber optics.

**1. Twisted Pairs**

The twisted pair cable consists of a set of twisted pairs, covered with an external protective layer of insulating material as in the figure (4 -7). One of its advantages is that it is cheap, but the speed of data transfer on it is slow, especially when sending and receiving multimedia data.



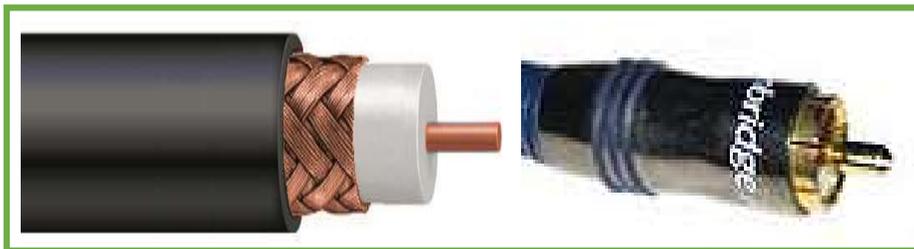
Figure 4-7  
Twisted Pair

### *Twisted pair features*

- Cheap price.
- Easy to install.
- The most used media.
- Twisted pair disadvantage
- Data transfer speed is less than 100 Mbps.
- Do not use in long distances.
- Easy eavesdropping and steal of information.

### **2. Coaxial Cables**

The coaxial cables consist of a copper wire to transmit signals, a protective material surrounding it and a metal net surrounding the insulation material and act as a ground end to reduce noise and distortion in the signal and then a plastic insulating outer layer as in the figure (48-). It is one of the most common types after twisted pair. It's very similar to a TV cable. One of its advantages is that it is faster than twisted pair and is used to send and receive multimedia data as well as for longer distances.



**Figure 4-8**  
**Coaxial**  
**Cables**

### *Coaxial Cable features*

- Easy to install.
- Higher speed than scheduled.
- Use for longer distances than twisted pair.
- Resists the factors affecting the signal better than twisted pair.
- Can be used to send data in multimedia format

### *Coaxial Cable disadvantage*

- The cost is relatively higher than twisted wires.
- Easy eavesdropping and theft of information.
- Is affected by external distortion factors, but less than twisted wires.
- Can be eavesdropped and data stolen

### 3. Fiber Optics

Fiber optics are a very thin flexible glass tube through which information is transmitted at the speed of light as in the figure (4- 9). It is very fast and secure in the transmission of information and longer distances. But they need to be careful in dealing with them so as not to damage them. They are also high, and they are characterized by the high cost of manufacturing and installation.



**Figure 4-9  
Fiber  
Optics**

#### Fiber Optic Features

- Lighter and smaller than other wire types.
- Higher speed than other types.
- Used in long distances (hundreds of kilometers).
- It cannot eavesdrop and information was stolen.

#### Fiber optic disadvantage

- More expensive than other types of wires.
- Cut able (break from the inside) and bend.
- Difficulty of installation and need special equipment.

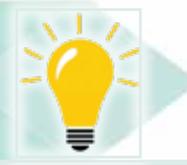
Here’s a simple comparison between wired media types as in table (4- 2).

**Table 4.2 Comparison of wired media types**

Comparison Factor	Twisted Pair	Coaxial Cable	Fiber Optics
cost	low	medium	High
speed	low	medium	High
Type of transmitted data	preferred to be text	Could be multimedia	Could be multimedia
distance	Small and it need signal amplifier (repeater ) 1100-m	Longer than twisted wires 1500-m	very long distance compared with twisted wires
Weakness of signal with the distance	high	low	Very low

**Skill 4 - 11**

Identify the wireless media and distinguish among its types.

**Second: Wireless Media**

These networks rely on the use of wireless waves to transmit data and communicate between users and devices. There is now a significant development in wireless data transmission media due to its multiple features and the demand for people to use it to meet their needs for continued connectivity to the network with mobility, mobility, etc. There are many types of wireless data transmission, including:

- Using Radio Wave
- Using Microwave
- Using Satellite
- Using Infrared

**1. Radio Wave**

Used to transmit sound and image. The frequency is between 10 and 100 kHz.

Features of radio waves

- Travelling for hundreds of kilometers
- Penetrates buildings

**2. Microwave**

Microwaves use electromagnetic waves to transmit signals and data. Frequency between 100 MHz and 100 GHz.

**Microwave advantages**

- Very high speed.
- Preferred in remote and isolated areas of wire types.
- It may be cheaper and easier than wiring in the case of commercial and important areas.

**Microwave disadvantages: -**

- Difficulty installing.
- Exposed to many factors of distortion.

**3. Satellite**

Satellites also use microwaves to send and receive signals and data.

Satellite features

- Very high speed.
- Microwave defects
- Difficulty installing.
- Exposed to many factors of distortion

#### **4. Infrared**

Infrared is used within limited areas such as one room and sends the signal in a straight line and frequency between 100 GHz and 100 THz.

##### ***Infrared features***

- Very high speed
- Signals cannot be eavesdropped and data is not stolen.

##### ***Infrared defects***

- Do not use in long distances.
- Signals must be sent in straight lines.
- Signals are exposed to many distortion factors from the surrounding environment

#### **5. Bluetooth system**

##### ***Bluetooth features***

- Not affected by external factors affecting the signal
- Low cost

##### ***Disadvantages of the Bluetooth system:***

- Up to a few meters in range

#### **6. Wi-Fi System**

It has become one of the most used systems especially in homes, shops, hotels and others.

##### ***Wi-Fi features***

- Low cost.
- Provides security and protection for transmitted data.
- Complies with a number of devices

#### **7. Wi-MAX System**

It is similar to Wi-Fi and has a range of more than 50 km and data transfer speed of up to 70 Mbps.

**Skill 4 - 12**

The ability to categorize networks in terms of the way they connect.

**4 -3 -3 Types of networks according to connection method**

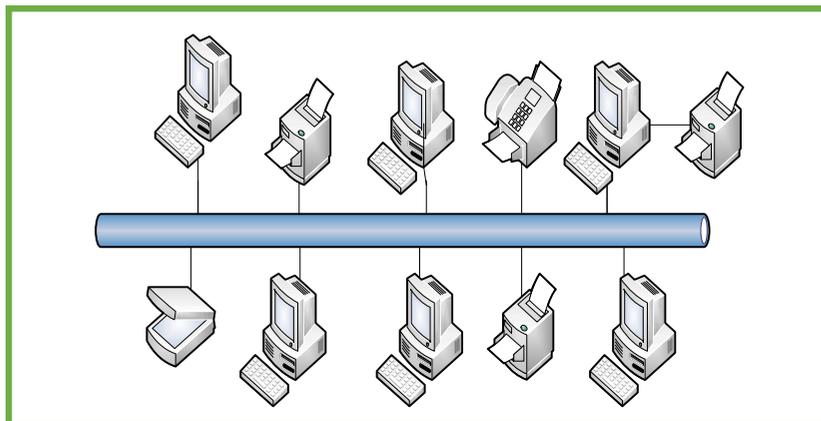
There are many types of networks in terms of network form or network topologies. Here are some of these types:

**Skill 4 - 13**

Recognize the Bus Network and mention its characteristics.

**First: Bus Network**

The Bus Network is one of the simplest forms of networks. It consists of a main cable to which all devices are connected by a set of subcables as in the figure (4-10). All devices are sent from this main cable and can only be read from device to which the data is transmitted.



**Figure 4-10**  
**Buss**  
**Network**

**Bus network features**

- Cheap cost.
- Easy installation and connection.
- The network does not crash if a computer crashes.

**BusNetwork disadvantage**

- Terminator must be installed on both sides.
- Network speed and efficiency are influenced by the number of devices
- The network is disabled if the main cable crashes.

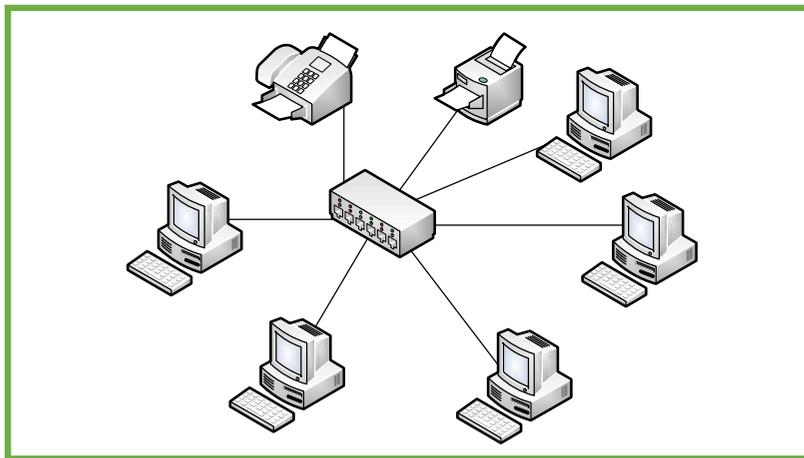
### Skill 4 - 14

Recognize the Star Network and mention its characteristics.



#### **Second Star Network**

In the Star Network, all devices are connected to a connection device called a switch or HUB regulator as in the figure (4- 11). Computers send data, for example, to the distributor who strengthens it and then sends it to the beneficiary.



**Figure 4-11**  
**Star**  
**Network**

#### **Star Network advantages**

- Easy control of the network and its management.
- Easy installation and maintenance.
- High speed
- Do not disable the network if a computer crashes or a subcable is broken.

#### **Star network disadvantages**

- Distributor crashes cause the entire network to crash.
- The high cost of having a distributor and many cables.
- The number of devices in the network depends on the number of ports in the distributor.

### Skill 4 - 15

Recognize the ring Network and mention its characteristics.



#### **Third: Ring Network**

In the Ring Network, the devices are connected to each other in the form of a closed path and a loop as in the figure (4- 12). This network does not contain the

main cable and a distribution device so each device that receives data and tests it if it is sent to it and retains it otherwise it will be sent back to the next device, and so on until the device sent to it receives it. Therefore, if there is a problem with a device connected to the network, it can affect the network. If the network is equipped with two separate paths, if one path is disabled, the other is used.

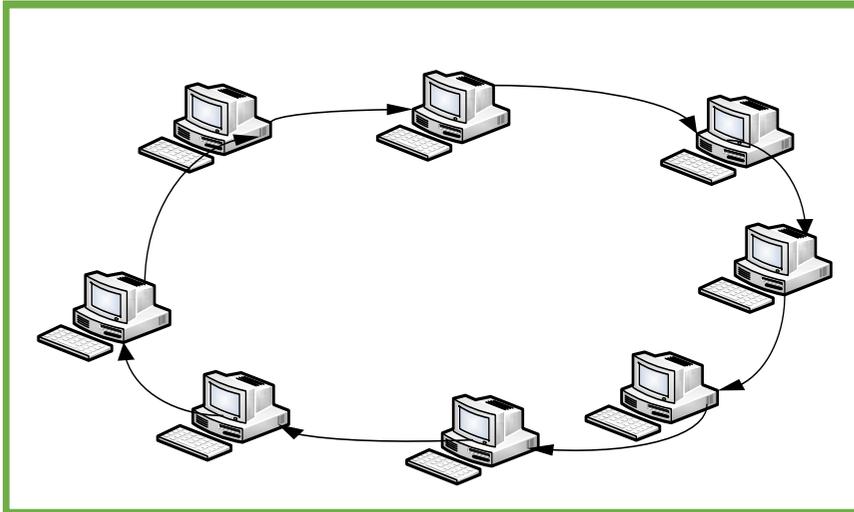


Figure 4-12  
Ring  
Network

#### Ring Network disadvantages

- Easy installation and connection.
- Cheap costs

#### Ring Network disadvantages

- Slow speed
- If a device crashes, the entire network is shut down
- When a problem occurs, it is difficult to identify
- Can't more than one data transmitter at a time.

#### Skill 4 - 16

The ability to categorize networks in terms of communication methods.



#### 4- 3- 3 Types of Networks in terms of Communication Method

There are two types of networks depending on the method of communication (or network configuration)

### Skill 4 - 17

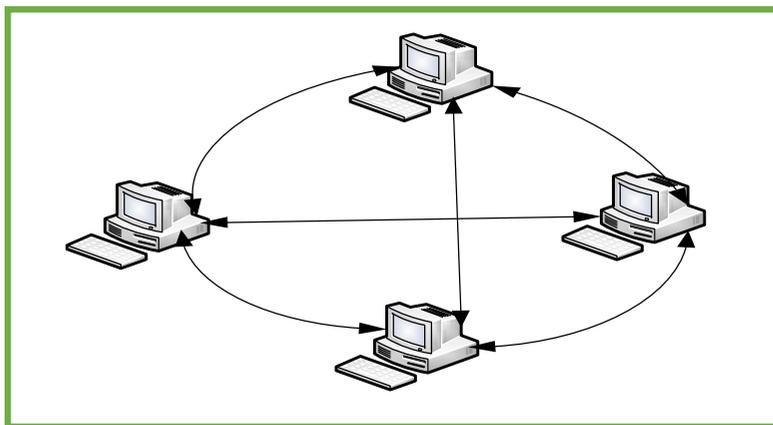
Recognize the peer-to-peer network and mention its characteristics.



#### **First: Peer to Peer Networks**

Peer to peer network definition: Are a group of equivalent devices directly connected to each other.

This type of small local networks, such as a home network or an office network, is to create a working group among users to share available resources. It does not require a server or a central device with high storage or processing capabilities, because any device can be a server or client at the same time and has its own security system. Figure 4.13 gives an example of peer-to-peernetwork. There are operating systems that support this type, such as Windows for Workgroups.



**Figure 4-13  
Pair to Pair  
Network**

#### **Peer-to-peer network advantages:**

- Easy installation and setup
- Low costs do not need server or difficult settings.
- You don't need additional software on the operating system.

#### **Disadvantages of peer-to-peer network**

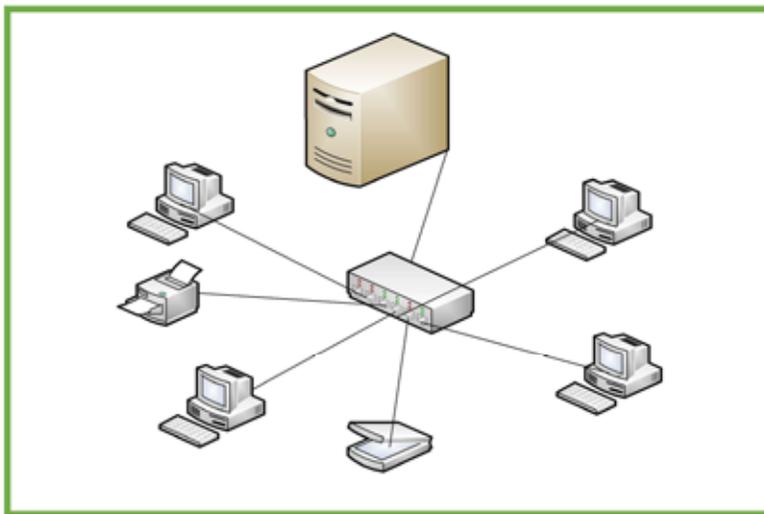
- The number of devices is limited (ten devices) they are not suitable for large networks.
- Difficulty dealing with the network in the case of a large number of devices
- Unsafe.
- It is difficult to back up

**Skill 4 - 18**

Recognize the server and client network and mention its properties.

**Second: Client and Server Network****Client and Server Network definition:**

It is a set of devices (client) connected to a central device (server) that contains data and software and controls the reception and transmission of data between connected devices and manages most processes on the network as in the figure (4- 14). This network may contain more than one server depending on the size of the network, the amount and nature of the work and tasks required by the network. They are more suitable for large companies and banks.



**Figure 4-14**  
**Client**  
**Server**  
**Network**

**Advantages of server and client networks**

- Can handle thousands of devices
- Easy to backup
- Easy modification and control of the network and its management
- Easy data and network security
- The possibility of increasing the number of devices and software at any time and easily
- Server and client network disadvantages
- High cost of having a high-specification server and other devices
- Server failure causes the entire network to stop.

**Skill 4 - 19**

Comparison between Peer-to-Peer network and server and client network.



The following is a comparison between the peer-to-peer network and the server and client network as in table 4- 3.

**Table 4.3 Comparison of network types in terms of communication style**

Comparison Factor	Peer to peer network	Client and server network
Cost	Low cost	High cost cause need server
Number of devices	Limited 10 devices as maximum	can include large number of computers
Network services and management	Distributed on all connected computers	Centralized only on server
Access to the data and information	Information is difficult to access as the number of devices increases	Easy access to information and data because it positioned in the server
Development, modification and maintenance	Difficult to develop and maintain as a result of decentralized management	Easy to develop and maintain as a result of central management
network security	It is difficult to secure, especially when increasing the number of devices because each device needs its own security.	Easy to secure as a result of centralized management that makes server security a network insurance

**Skill 4 - 20**

Identify the basic components required to build a local network.



**4- 4Required Componentsto make a local Network**

The required components vary from network to network due to many factors, including:

- Number of devices to be connected to the network
- Network coverage area and distance between devices
- Geographical nature of the location (wired or wireless)

- Centralize data, information, software, management and control (peer-to-peer or server and client)
- The type of data and information that is sent and received over the network (text, images, video, voice)
- The amount of data to be traded over the network per second (data speed)
- The amount of data, information and software to be stored on the network
- The required level of security.
- available financial support.

**However, there are a number of basic components found in most networks:**

- At least 2 computers
- Network Interface Card(NIC): The number of NIC equal the number of connected devices in the network. They are used to connect devices to the means of communication (cables). There are types of them:
  - Built in link cards.
  - Connecting cards purchased and installed on the device.
- The type of means of communication or data transfer, controls the type of network card, including:
  - Wired network link card
  - Wireless network link card
- Media (wired or wireless)
- Network Operating System operating system)
- Devices that connect and connect devices to each other (Switch distributor - Hub organizer - router network router)

### Skill 4 - 21

Learn about the evolution of the Internet.



## 4- 5 Introduction to the Evolution of the Internet

The Internet, sometimes simply called 'Net', is a global network of computer networks - a network in which users through one computer, if they have permission can obtain information from any other computers (and sometimes speak directly to users on other computers). The U.S. Department of Defense (Pentagon) laid the foundation for the Internet nearly 30 years ago with ARPANET. However, the general person did not use the Internet much even after the development of the World Wide Web in the early 1990s.

The World Wide Web or Textile emerged in 1991, thanks to developer Tim Berners-Lee and others at CERN. The CERN team created the protocol based on

hypertext that makes it possible to connect content on the web with hyperlinks. Berners Lee now manages the World Wide Web Consortium (W3C), a group of industry and university representatives that oversee web technology standards.

By the end of 1992, Delphi provided full internet access to its subscribers; followed by many other service providers. In June 1993, the Internet was filled with only 130 sites. By one year, the number had risen to nearly 3,000 sites. By April 1998, there were more than 2.2 million websites. Today, the Internet has become a public, cooperative and self-sustaining facility accessible to hundreds of millions of people around the world. Physically, the Internet uses part of the total resources of existing public communications networks. Technically, what distinguishes the Internet is its use of a set of protocols called 'TCP/IP' and means transmission control protocol/IP. To view files on the web, you need a web browser. You can use this program to view different websites, known as web pages. A collection of web pages is a web site. The first page of the Web site is often called the home page.

Just as every home in the world has a unique address, every web page in the world has a unique Internet address, sometimes called the URL. For example, the Internet home address for Windows is: <http://www.microsoft.com/windows>.

**Skill 4 - 22**  
learn about the Internet



**Internet definition:**

A global network with a huge collection of different networks connected to each other and distributed all over the world with the aim of exchanging and sharing with each other. It is called a network or an abbreviation of the global network (INTERNationalNETwork) or INTERconnectingNETworks)

Internet network have expanded and spread and included within them all kinds of networks (WAN/MAN/LAN) and therefore are not owned by a particular party or country.

**Skill 4 - 23**  
A distinction between the Internet and the Web.



**4- 6 Deference between Web and Internet**

**World Wide Web (WWW) definition:**

It is a service that obtains information stored on the Internet through a huge

collection of pages or websites. The World Wide Web is a user interface for the Internet. It consists of a huge collection of hypertext documents stored on the Internet. They are accessed and handled through a program called a browser. Many of these browsers include Google Chrome, Internet Explorer and Mozilla.

**Skill 4 - 24**

Learn about the Web Browser and Distinguish between Page and Site.



Browser definition: Browser is a program that lets you view web pages and images of content over the Internet.

Web Page Definition: A document that uses multimedia (text, image, voice, and video) to display information directly or through a set of interconnected text documents to open other pages or play files. It is called a page for abbreviation.

Web Site definition: A collection of web pages those are interconnected to provide a range of information. It is called a site for abbreviation.

**Site components: The site consists of:**

- Home Page or Home Page
- A collection of Content Page
- A set of hyper-linking links to link pages together.

The definition of the home page: is the front page of the site and usually contains the name and logo of the site, a welcome phrase, pictures, an index of the contents of the site and a set of cross-sectional links to move to different content pages and may also contain a set of hyperlinks to a range of sites related to the site.

Content page definition: A page or pages that contains the information to be displayed to the user.

**Skill 4 - 25**

Learn about Website Components and Types.

**4 -7 Types of Websites**

There are many factors that control the type or classification of the site such as:

**A. Owner of the site:**

- Private Sites

- Government sites: Government sites end up with their internet address.gov
- Corporate sites: Organization Sites and its Internet address ends with.org

**Content (services and information provided by the site) including:**

- Information sites and their Internet address ends with.inf
- Communication Services Sites and their Internet address ends with.comm
- E-newspaper and magazine websites
- E-education sites and their internet address ends with .edu
- E-commerce sites
- Commercial site their internet address ends with .com
- Entertainment Sites

**A. Interaction with the user**

- Static site or non-interactive sites called web 1.0: sites allowed the user is only reading it only. Do not allow the addition, deletion, or editing of its contents.
- Dynamic Sites, Interactive Sites or Web 2.0: sites that allow the user to interact with content from add-on, deleting, or editing.

**Skill 4 - 26**

Enumerate some of the features of the Web.



**4 -8 Internet Features**

**The Internet offers many features such as:**

- A huge collection of information in various areas that are constantly renewed.
- Easy and fast access to information anywhere in the world.
- Easy and fast communication with millions of people from all over the world directly.
- Watch and interact with international news and events as soon as they happen.

**Skill 4 - 27**

Learn about some of the uses of the Web.



**4 -9 BasicUses of the Internet**

The services provided by the Internet are numerous and varied, but we will mention some of them in Table 4- 4. Note that all of the services mentioned can be used in the educational and research process.

Table 4.4 Description of some basic Internet services

Service	Description
World Wide Web (WWW)	This service is most widespread and used to obtain the required information in its various forms on the Internet through the browser explorer program.
E-mail	E-mail service is a powerful service that has led to the spread of the Internet in all community circles. The message (text, voice, video) can be sent instantly, unlike other means. The message can be read and answered at any time.
File Transfer Protocol (FTP)	Upload and Download Files is an online file sharing and download service. So you can store (upload) your files and documents online and upload them at the worst time you want.
Internet Chat	This service helps users to communicate and interact with each other by writing, chatting, or sending files, whether in the form of photos, sounds or video.

**Skill 4 - 28**

Distinguish among types of Internet connection lines.



#### 4.10 Types of Internet Connection Lines

##### A. Internet connection is done in two steps- :

1. Contact with your Internet Service Provider (ISP) and request to subscribe to the Internet.
2. Choose a means (lines) to connect to the Internet because each medium has its own speed and cost.

##### B. Types of Internet connection lines

The types of internet connection lines are divided into two types:

##### Wire Telecommunications:

- Dial-Up: In which the public telephone network (Public Switched Telephone Network (PSTN) is used, which is one of the most widely used types of communication lines due to its licenses and spread, but it is the slowest types where its speed reaches about 56 kbps and the telephone line is also busy for the duration of internet use. The connection is done using a modem that is connected to your ISP.

To know the role of the modem: We should know that the computer only deals with data in the form of Digital Signal, while data travels over telephone lines in the form of analog signals. Therefore, a device that converts from digital to

analogue signals should be used to send it over telephone lines and then reverse analogue signals to digital signals to receive data from telephone lines and can be handled by the computer (modem).

A modem is a device that converts the digital signal into analogue and vice versa. The word modem is an abbreviation of two words: modulation, conversion of digital signals to analogue signals, and demodulation, conversion from analogue to digital signals.

### ***Integrated Service Digital Network (ISDN)***

It is a network that offers many services, including the allocation of a telephone channel and an Internet channel at the same time on the same cable, so that the phone line will not be busy when using the Internet. The signals are transmitted digitally. It reaches a speed of about 64 kbps if you use one channel or 128 kbps when using the two channels.

### ***Digital Subscriber Line (DSL)***

A line that allows internet access and download information at speeds of up to 512 kbps.

### ***Asymmetric Digital Subscriber Line (ADSL)***

A fast internet connection with a speed of 256 kbps.

### ***Leased Line***

A special line rented by companies or agencies to connect their employees to the Internet permanently and at high speed ranging from 56 kbps to 45 Mbps.

### ***Fiber Optic***

Fiber optic cable is a very thin tube of flexible glass through which the data is transmitted in the form of pulses of light (each pulse represents a bit) and this tube is covered with a plastic cover. So the data travels at the speed of light.

### ***Wireless Communications:***

- Wi-Fi: a type of high-speed wireless connection. Radio waves are used to transmit data instead of wires.
- Satellite communication: This connection is very fast and covers very high areas regardless of the geographical nature of these places. But it is burdened with high cost.

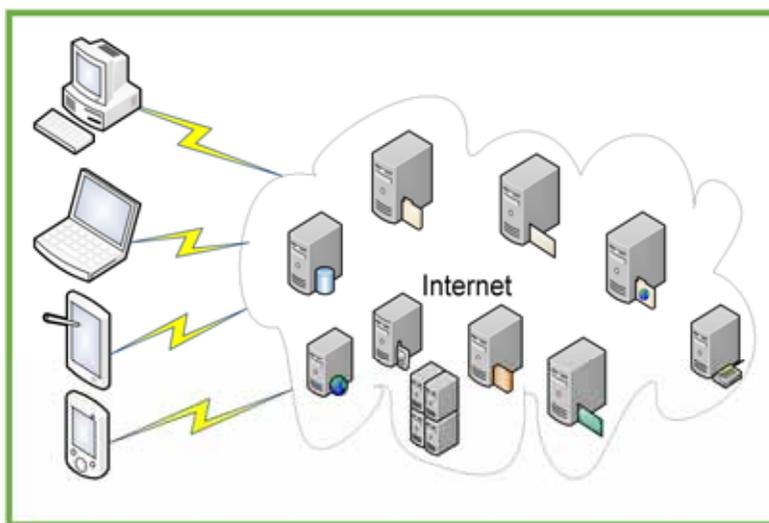
## 4- 11 ServersTypes

### Skill 4 - 29

learn about the Server and identify some types of Internet Servers.



Server definition: It is a computer with high specifications (processor speed - memory space and storage ... It provides data and services to other devices. The server can be a PC or device specifically designed to be a server. The Internet is actually based on a huge number of your servers in the figure of (4- 15).



**Figure 4-15**  
Some  
Servers  
used in  
Internet

**There are many types of servers, such as:**

1. Web Server Definition: Is the software responsible for providing web pages, their irradiated or hypertext, and linked text, voice, image or video of the user (web browser) and hosting web pages.
2. Email Server Definition is software provides user email server services to create an account, manage mail servers, send and receive an e-mail, as well as provide space for storing and sharing various documents, etc.
3. Application Server Definition: Software provides a suitable operating environment for running a range of applications and is handled and accessed by the Application Program Interface (API).
4. Database Server definition: software contains an application or applications for a database that operates and manages the database and allows other devices to deal with it.
5. Domain Name System server: A software stores information about domain

names in the internet database, linking page names and information to domain names, for example, when typing the website of The University of Bisha <http://www.ub.edu.sa> on any browser, converted by DNS to the host server address of the university's website, which is <http://51.211.174.136/>

### Skill 4 - 30

Identify search tools and distinguish among their types with examples and identify search engine components.



## 4 -12 Search Tools

Definition of search tools: A set of software that is used in the search to access data and software distributed on the Internet. There are three types of research tools as in the figure (4 -16)



**Figure 4-16**  
**Search Tools**  
**Types**

**Search Engine:** A system that helps in the search for information stored in the World Wide Web and review ranked results. Among the most famous examples: Google chrome - AltaVista –HotBot and Infoseek. In the practical part, we will be exposed to the most famous search engines and how to use one of them.

The search engine consists of three programs interconnected together as in the figure (4- 17)

Spider Program is a collection of programs used to explore and collect information about web pages in a database.

- **Index Program:** The program indexes and arranges the database. Search and order methods vary from engine to engine.
- **Search Program:** receives key words from the user through the Search Box searches for them in the indexed database, and then displays the user's ranked search results.

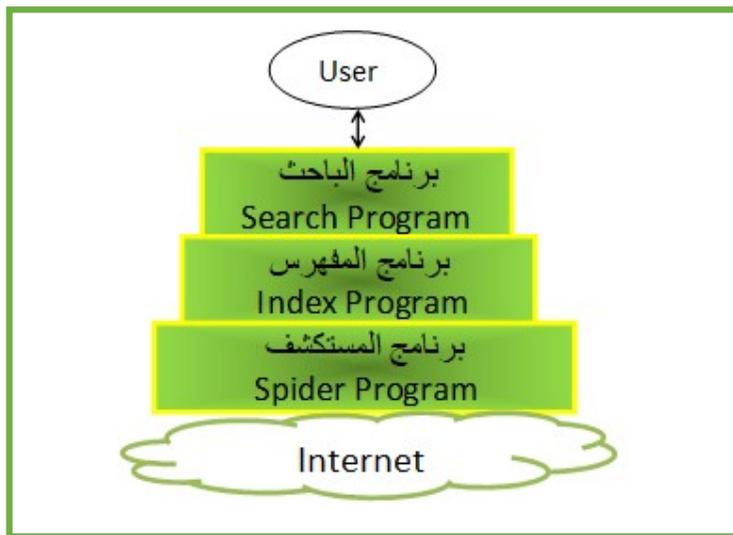


Figure 4-17  
Search  
Engine  
Component

**Search Directories:** It is a program very similar to the search engine in terms of use and work but different from that of the person who is doing the exploration and searches on the Internet is a human crew and not a program. As a result of the presence of the human crew in the process of exploration and the collection of information about the pages, search results are more accurate than the search engine but limited in engine coverage. One of the most popular search guides is Yahoo (DMOZ) and DMOZ (DMOZ)

**Meta-Search Engine:** The engine does not contain a database of web pages but do the search using other search engines and then display the results to the user. Like Info (Info.com), Mamma(Mamma.com)

#### Skill 4 - 31

Definition of the Protocol and some examples of it.



### 4 -13 Types of Protocols

Protocol definition: It is a set of rules and procedures that govern and regulate communication and interaction among network-connected devices and how data is transmitted. There are many types of these protocols, such as:

#### Types of protocols:

##### 1. TCP/IP (Transmission Control Protocol/Internet Protocol)

This protocol uses in the Internet to identify the transmitted and received devices and then the data is sent and received between them.

## 2. HTTP (Hyper-Text Transfer Protocol)

It is responsible for the connection between the web server and the web browser in the user's device, the HTTP protocol is used to send a request from your device (client) via the browser to the web server, and to receive in the form of web pages from the server to the client's browser.

## 3. HTTPS Protocol (Secure HTTP)

HTTPS is responsible for the secure communication between the web server and the web browser, the HTTPS protocol is based on the execution of financial and personal transactions such as the use of credit cards and other private data.

## 4. FTP (File Transfer Protocol)

This service is a TCP/IP application that makes it possible to transfer files between different computers connected to the Internet.

### Skill 4 - 32

Distinguish between the Internet Search methods.



## 4- 14 Internet Search Methods

### *There are two ways to search in the Internet*

1. Simple Search: A method used by the majority, especially beginners, in which only a word or search words is entered without any signs or symbols and then searched for them. Therefore, simple search results are inaccurate.
2. Advanced Search: In this search, we use with keywords (search words) a set of mathematical symbols (e.g., -,\*) or logical ((And, Or, Not) or special tags such as (';?), etc. The results are accurate. We will explain in detail with examples of the tags and symbols used in the advanced search in practical application in Chapter 12

## 4 -15 General Tips to Run Search in Internet

### Skill 4 - 33

Identify Internet Search steps efficiently.



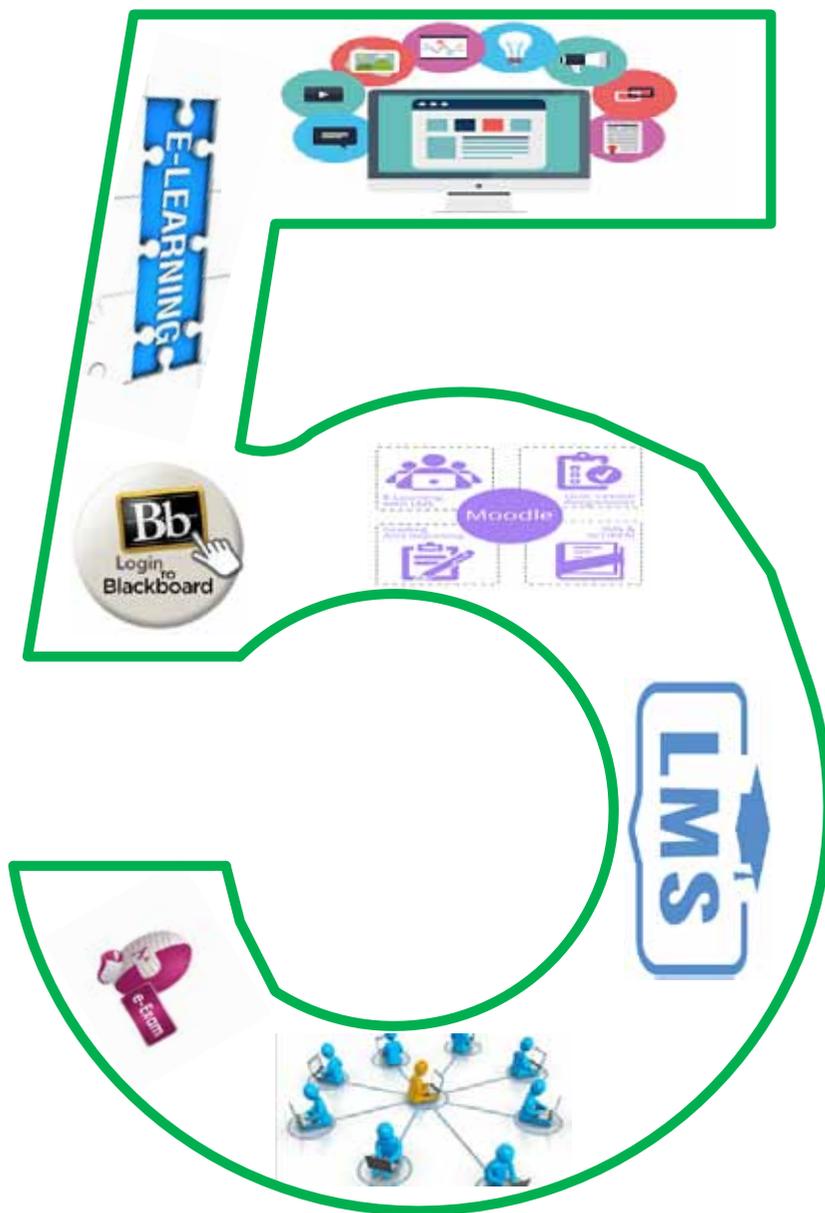
- Select what you want to look for in a set of words
- Use different formulas for these words (singular, Plural, synonyms)
- Make no effort to use prepositions, kindness, identification tools, etc. as Search engines neglect all of it.

- It is preferable to use specialized search engines in your field of search (there are a group of search engines specialized in certain areas such as medicine, engineering, economics, scientific research and periodicals) and if you do not find use general search engines such as Google.
- Use advanced search for accurate results.
- Use more than one search engine if you don't get the desired results.
- Be aware of the main topic you are looking for and sub-topics so that you do not get distracted and you don't get interfered with the information.
- determine which search engine you will use to learn about the data and specialized topics and how to use it optimally.



# Chapter 5

## E-learning







## E-learning

### Objectives

#### ➔ Main objectives:

1. Knowing about e-learning, methods and systems.
2. Knowing about Shams platform.

#### ➔ Sub-Objectives

After studying this chapter, the student is expected to master the following knowledge and skills:

1. Know about e-learning in terms of origination and components.
2. Know about e-learning objectives.
3. Distinguish between e-learning systems and their different types.
4. Know about e-learning methods.
5. Know about the Blackboard system used in the university.
6. Distinguish between different e-learning systems.
7. Know about one of the distinguished e-learning platforms (Shams platform)



## 5 -1 Introduction to E-learning

The emergence of digital e-learning is linked to the emergence and spread of the Internet, although early e-learning attempts exist, for example:

- In the 1920's, the educational radio appeared.
- In the 1950's, television appeared.
- In 1963 the University of the Air in Britain appeared and was later called the Open University.
- In 1985 the emergence of distance education and the use of the Internet.
- In 1990, distance education spread using digital technology via computers and the Internet.

However, e-learning systems did not appear until 1995 AD, and developments continued until the emergence of the Blackboard system in 2006 AD in Washington, America.

### *Among the most important modern trends in e-learning:*

- **Massive Open Online Courses (MOOCs)**

These open online courses allow millions of people around the world to train together in one session.

- **Mobile-learning**

Training courses are available online on portable electronic devices such as mobile phones, tablets, etc. This allows learning opportunities at any time, from anywhere.

- **Learning through Social Media**

Social media can become an essential forum for sharing ideas and academic lessons. Therefore, it may be a fertile environment for e-learning, as did educational channels appear on YouTube, for example.

- **Virtual Technology**

Future virtual reality technology can place learners in the role of explorer, astronaut, historical character, etc. Wearable tech devices like Google glasses and others can be a way to learn.

- **Gamification**

Future e-learning courses are more likely to resemble an interactive video game rather than a traditional lecture.

## 5.2 E-learning Components

### Skill 5 - 1

Knowing about the components of e-learning.



E-learning is presented in two methods, namely, self-e-learning, also called Web-based training (WBT) in which educational programs are usually placed on a web server. the second method is e-learning that is provided by the professor and provides lectures and electronic activities. Various types of e-learning components can be combined together, such as e-learning content, e-teaching and training, collaborative learning, and virtual classes.

#### 5.2.1 E-learning Content

*E-learning content is provided in the following ways:*

- Simple Learning Resources: uses simple non-interactive resources such as documents, presentations, videos or audio files. These materials are non-interactive so that students can read only or view the content without doing any other work.
- Interactive e-lessons: it is the most used method for e-learning and is used to interactive electronic materials, and includes text, animation, audio and video.
- Electronic simulations: it is the use of simulations for the real world, which allows learning to be more effective than ordinary e-learning.

#### 5 -2- 2 Teaching and E-training

Teaching and e-training can deliver services that provide human and social dimensions for students to support them through the learning experience.

E-training is defined as the process in which an interactive environment that depends on the computer, networks and multimedia is created, which enables the trainee to obtain the training objectives by interacting with such sources, in the shortest time possible, with the least effort exerted, and at the highest quality levels without being restricted to the limits of the place and time.

E-learning is offered at different levels for the educational institution. For example, at Bisha University, teaching is offered at three levels: supportive e-learning, blended e-learning, and full e-learning. E-learning provides individual support to the student through e-learning tools.

### 5-2-3 Collaborative E-learning

Collaborative e-learning is a strategy that helps students to learn together using collaborative learning tools. Collaborative activities are formed through e-learning management systems and from collaborative programs such as chat, wiki, web conferences, social networks and conversation. Figure 51- explains the most important Collaborative e-learning tools.

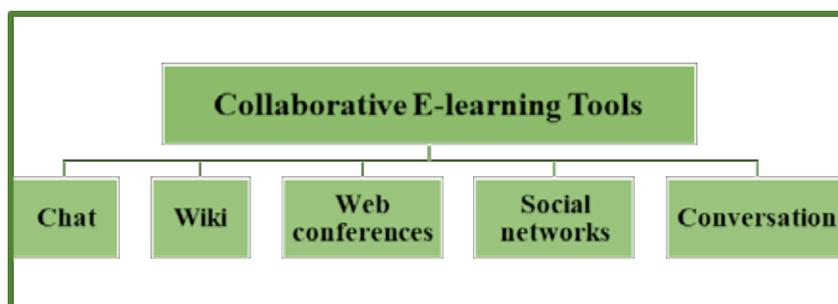


Figure 5-1:  
Collaborative  
e-Learning  
tools

### 5-2-4 Virtual Classes

Virtual classes, smart classes or virtual classes are one of the types of synchronized e-learning in which the staff member and students meet at the same time through a virtual environment, and not necessarily in the same place. This is done by virtual classroom systems and through which the staff member can provide electronic content and electronic activities for students over networks to participate in collaborative learning situations.

## 3-5 E-Learning Objectives

**Skill 5 - 2**  
Knowing about e-Learning objectives.



**E-learning aims to many objectives, including:**

- It increases opportunities for learning.
- Develops students' skills and competencies by using web and other technologies.
- Presents content in various electronic forms.
- It improves the learning process, and helps the staff member to improve and develop the course.
- It enables students to self-learn.
- It provides an opportunity for collaborative learning among students.
- It works to keep abreast of technological developments in the field of learning.

- It enables staff members from abroad to participate in the learning process.
- Contributes to the creation of infrastructure and a base of information technology for universities.
- Provides multiple sources of knowledge.

### 5 -4 Types of E-learning

E-learning is divided into synchronous and asynchronous, and each type has its advantages.

**Skill 5 - 3**  
Knowing about synchronous e-learning and tools..



#### 5 -4 -1 Synchronous E-learning

Synchronous e-learning is sometimes called direct learning and it requires that its activities occur at the real time, but not in the same place. Its tools include text chat, audio and video conferences. Figure 52- shows these tools.

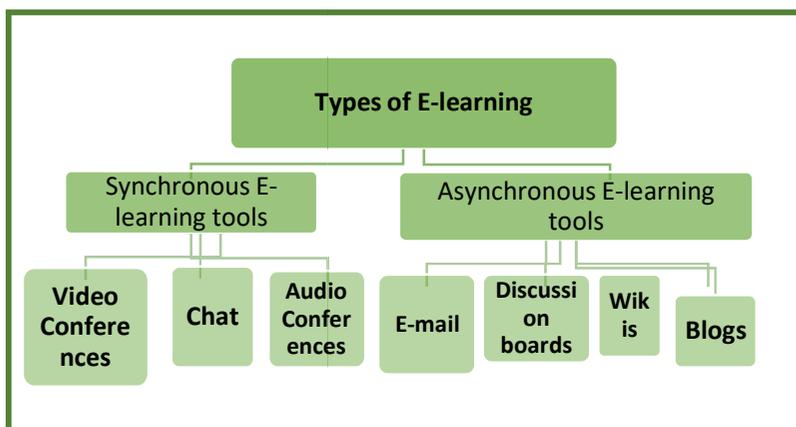


Figure 5-2:  
Types of e-learning

#### Synchronized Communication Tools:

- Chat: it is a tool of synchronized communication tools in the form of text messages, helping students and staff members to discuss a specific topic of the course topics, and it is an integrated tool in all e-learning systems.
- Audio Conferences: it is a tool of synchronized communication tools that are in the form of audio messages, connecting the speaker (the lecturer) with a number of recipients (students) in separate places.
- Video Conferences: in which the audio and video are delivered directly over the air via the virtual session of the lecture and are in real time.

## Skill 5 - 4

Knowing about asynchronous e-learning and its tools.



### 5-4- 2 Asynchronous E-learning

Asynchronous e-learning is one of the most common types of learning because it does not require synchronization in time to learn, as the student can interact with the content in its various forms in their spare time. Examples of its tools are wiki, blog, forum and e-mail. Figure 53- shows the asynchronous e-learning tools.

#### **Asynchronous Communication Tools:**

- **E-mail:**

It is considered as one of the most important means of communication between the student and the staff member, or the students among themselves. In each course, there are different e-learning systems that are used by students and the staff member to communicate with each other.

- **Discussion boards:**

It is the most used in learning and it is considered one of the interactive activities, in which the teaching member participates and the students respond or participate without being present at the same time.

- **Blogs:**

It is the most used Web 2.0 technology, and it is one of the basic interactive electronic activities in learning management systems. It is a specific activity that is activated by the staff member, whereby students write their ideas to participate in this activity.

- **Wikis:**

It is an interactive activity, whereby the staff member raises a topic in the relevant wiki activity. All students participating in the course are allowed to amend and add the relevant topic, which develops students' knowledge.

## Skill 5 - 5

Knowing about e-learning methods.



### 5-5 E-learning Methods

Figure 5-3 shows the most important modern e-learning methods that work on the success of the e-learning process, which depends on the computer, the Internet, the web and the virtual environment.

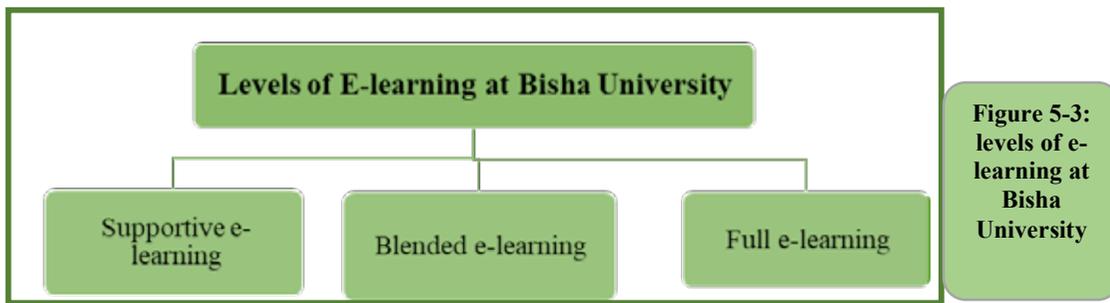


Figure 5-3:  
levels of e-  
learning at  
Bisha  
University

### 5- 5- 1 Learning by Computer

The use of computers has led to the development and improvement of the learning process electronically, so computers and networks are the backbone of e-learning management systems.

#### *Uses of computer and network in e-learning:*

- Individual learning.
- Computer aided learning.
- Learning as a computer a source of information.
- Computer networks are the basis for e-learning systems.

#### *Necessaty of learning by computer:*

- Because of the knowledge explosion and the information revolution.
- Easy to learn and use.
- Low prices compared to its big benefits.
- Provides a new and developed way of learning.

### 5- 5 -2 Learning in a Virtual Environment

It is a modern type of learning similar to regular classroom learning in terms of meeting students and staff members at the same time, except that it provides electronic content from electronic sources and activities over e-learning management systems with its various tools.

There are numerous systems for managing virtual classes, including (Bb Collaborative). Interactive tools in the virtual classes include:

- Video call.
- Text chat.
- Electronic whiteboard.
- Voice dialing.
- Shares an application from the staff member device.
- Share files.

### 5-3 -3 Learning through the Web

The web has provided many services for learning through the stage 1.0 and the web 2.0. Examples of services provided by the web 2.0, which are used successfully in learning, are site feeds, blogs, wikis and other web 2.0 technologies.

### 5-5 -4 Learning over the Internet:

It means delivering e-content and activities via internet learning management systems.

### The most important factors that helped to use the Internet in learning:

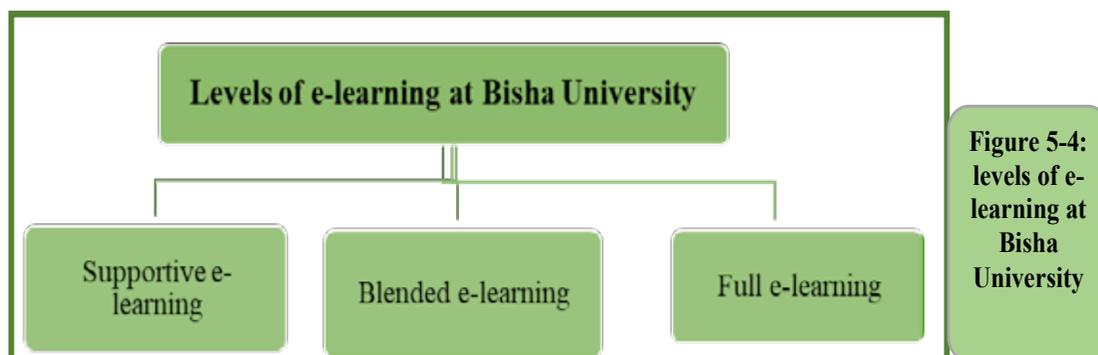
- Address the temporal and spatial dimensions.
- Save time and effort to obtain information in terms of speed of access to information.
- Provides collaborative learning opportunities.
- Developing teaching methods and systems.

**Skill 5 - 6**  
Knowing about the types of E-learning used at Bisha University.



### 5-6 Using E-learning in Teaching at Bisha University

Bisha University included e-learning in teaching e-courses at three levels: supportive e-learning, blended e-learning, and full e-learning. Figure 5- 4 shows these levels.



### First: Supportive E-learning:

Teaching takes place in the halls and uses e-learning systems and tools to support the learning process, and one of its characteristics is that the curriculum in the university's learning management system includes (description, evaluation, course objectives, content, and learning activities).

**Second: Blended E-learning**

In which a specified percentage of attendance is replaced by electronic activities using e-learning management systems at two levels: 25% and 50%, and is using systems, tools and environment of e-learning. A 25% of the total marks of the course are allocated to electronic activities.

**Third: Full E-learning**

In which a specified percentage of attendance is replaced by electronic activities using e-learning management systems and they are as follows:

- 40% of the total score allocated to electronic activities.
- What is taught synchronously at least 25% of the electronic course.
- What is taught in electronic activities is not less than 50% of the electronic course.

**Skill 7 - 2**  
Human-computer comparison.



**5- 7 E-learning Management Systems**

They are application programs which are used in the implementation and evaluation of the learning process. The learning management system supports the staff member to create and present electronic content from various electronic sources and interactive and non-interactive electronic activities, and to monitor student participation. The system also supports student participation for various sources and activities.

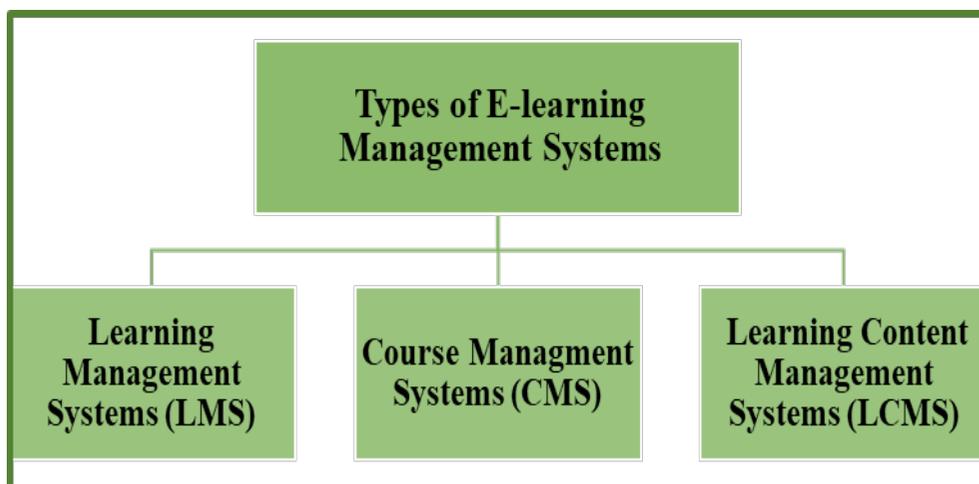


Figure 5-5:  
Types of learning management systems

### **5-7-1 Types of Learning Systems**

Learning management systems are divided into three types (learning management systems, course management systems and learning content management systems). Figure 56- illustrates these types.

#### **First: Learning Management Systems**

Learning Management System (LMS): It is a system that works to manage, follow-up and evaluate learning and synchronized and asynchronous electronic activities.

#### **Learning Management System Functions:**

*Learning management systems offer a number of functions, including:*

• Electronic content management.	• Authoring educational programs.
• Registration of students, staff and administration.	• Performance Management System.
• Curriculum Management.	• Resource Management.
• Skills and competencies management.	• System template.
• Evaluation.	• Developing collaborative content.
• Reports.	

#### **Second: Courses Management Systems**

It means the Course Management System (CMS) and focuses on the courses in terms of composition and development. This system enables the publication of scientific material, the management of study activities related to the course and the management of all existing courses.

#### **Third: Educational Content Management Systems**

Learning Content Management System (LCMS) focuses on educational content and gives authors the ability to create, develop and modify educational content more effectively.

The components of the educational content management system include the following:

- Application of authorship.
- Learning object repository.
- Dynamic connection interface.
- Management tools.

### **5-7-2 Types of E-learning Management Systems in Terms of Source**

The e-learning management systems are divided according to source into two types:

First: Closed Source or Commercial E-learning Management Systems (Commercial Systems):

These are systems that are owned and developed by a commercial company. The owner company allows the use of the system only with a license, such as the Blackboard system.

**Second: Open Source Systems**

They are systems that enable educational institutions to use for free and are subject to development and modification by many interested people around the world, but do not have the right to sell them.

Figure 5 -6 shows e-learning management systems in terms of source and examples.

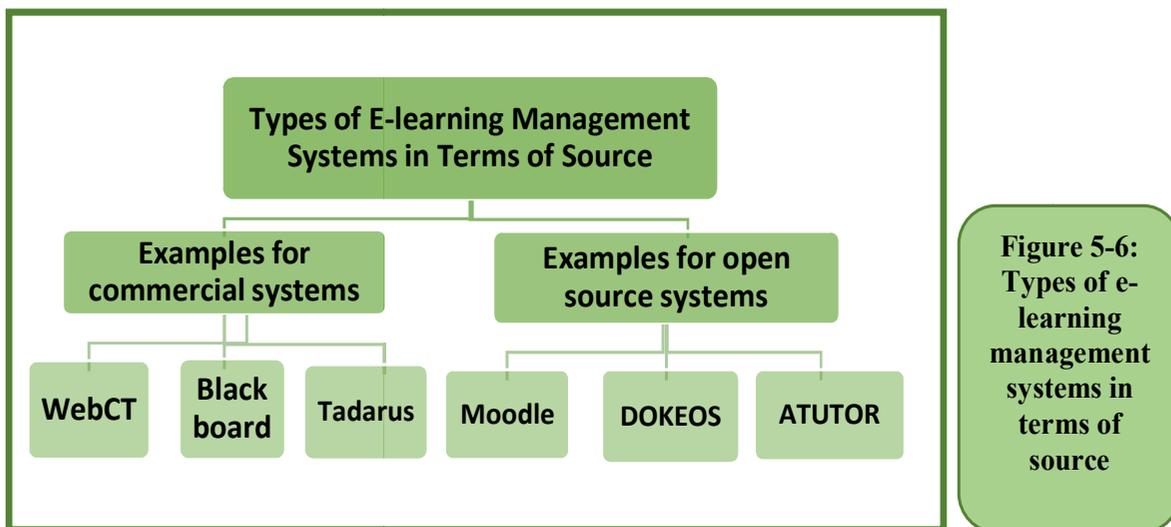


Figure 5-6: Types of e-learning management systems in terms of source

**Skill 5 - 8**  
Knowing about the Blackboard e-learning management system, its features and functions.



**5- 8 Blackboard E-learning Management System**

It is a commercial learning management system from Blackboard Company. The system contains multiple interactive tools from electronic sources and activities that support the staff member and the student. The system is characterized by ease, as it allows students to quickly access content, different activities, advertisements, etc. It also works to support communication and interaction between the staff member and the student, and between the students themselves, through synchronous and asynchronous communication tools.

***The most important features of the Blackboard system:***

- The integration of Blackboard with Shams platform.
- It has a forum for academic subjects.
- It has a file upload feature for faculty members and students.
- It has an email feature for students participating in the course and staff members.
- The presence of a wiki service.
- It has a blog service.
- It provides the staff member the advantage of dividing students into groups.
- It has a feature for creating tests.
- It enables the staff member to place a declaration, assignment or presentation of the course.
- It has a special bulletin board to announce new lectures and activities.
- It is compatible with international quality standards in e-learning.

***Advantages of the Bb Collaborative Virtual Classroom System:***

- The ability to send files to all the participants in the session.
- The possibility of creating groups to discuss a specific topic.
- Availability of the interactive whiteboard.
- Recording the various electronic lectures and activities accompanying the lecture with audio and video
- Students can interact with the moderator.
- Enabling application and program sharing.
- Availability of surveys for students.

***Among the most important advantages of the virtual classroom system (Collaborate), the latest version:***

- High quality web conferencing
- No need to install Java software, as it is based on (WebRTC) technology that does not need to install Java
- The ability to record virtual sessions in (MP4) format.

***Downloading the Blackboard App on Smart Devices:***

Blackboard has introduced an application for smart devices, which can be used by students for activities and learning resources. Students can download the application on smart devices running the iOS, Android and Windows operating systems. The following steps illustrate downloading the Blackboard app to smart devices:

- 1 Access to the store, using your smartphone of the following types: iPhone, iPod touch, Android
- 2 Search for the black board.
- 3 Install the Blackboard application on the smartphone.
- 4 Open the Blackboard app and search for Bisha University.
- 5 Log in with your Blackboard username and password.

**Skill 5 - 9**

Knowing about the Shams E-learning Platform.

**5 -9 Premium e-learning platforms**

Due to technical development, e-learning platforms have become a cornerstone of tomorrow's technology, enabling such platforms to contribute to supporting the learning process and facilitating educational resources as it provides easy access to educational information. In addition, these platforms saves money and time, and provide electronic content in many attractive and stimulating forms such as audio lectures, video lectures ( Video), pictures and graphics, audio or music clips, methodological educational contents, books and guides including textbooks, articles ... etc.

The premium platforms are defined by UNESCO as «the teaching, learning and research resources available through any digital or non-digital means that are in the public domain or have been issued under an open license that allows others to make free benefit of them, use them, adapt them and redistribute them without any restrictions or limited restrictions».

There are many platforms globally and in the Arab world. Among the world's most popular open source educational platforms are Khan Academy and IDEX.

**5- 9 -1 The most Popular Arabic Platform**

Among the most famous Arab platforms for open education are the following:

- Shams
- Edraak
- Rwaq
- Tahrir academy

We will address the Saudi Open Education Resource Network (Shams) platform in some detail.

### 5- 9- 2 Learn about the Shams Platform

According to the definition of Shams platform on its website, “Shams is the Saudi network for open learning resources that aims to enrich educational content to support learning and search for a sustainable path for partnership in design, improvement, maintenance, and enhancing the quality of digital educational content and contribute to providing more learning opportunities for speakers of the Arabic language” .

In the main interface there is an introduction to the sections and encyclopedias. The navigation bar in Shams contains many sections, such as: discover (this list contains encyclopedias, suppliers and resources), create, join, and help center.

Shams platform can be browsed through the following address <https://shms.sa>, as in Figure 5 -7

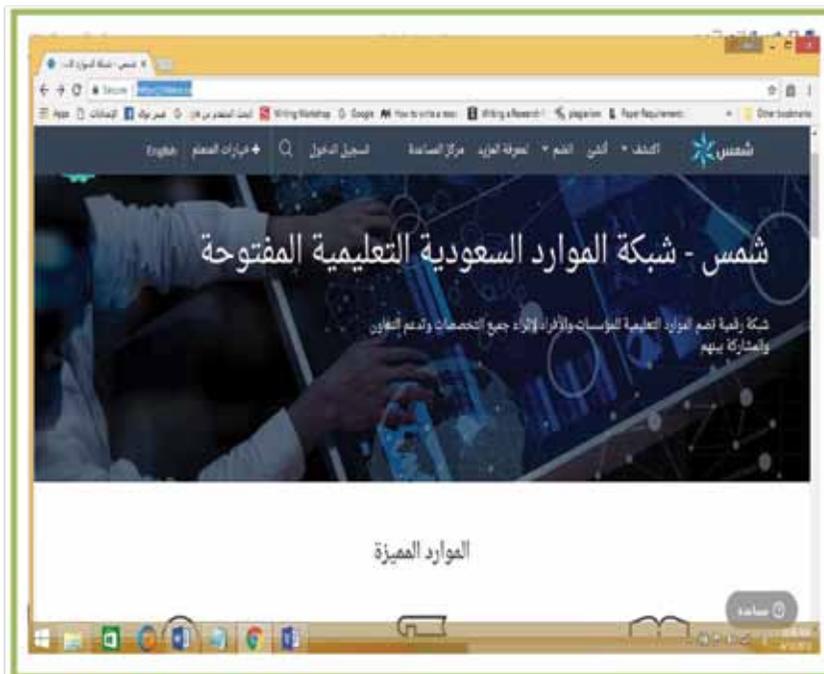


Figure 5-7:

Shams  
platform  
website

### 5-9 -3 Shams Platform Objectives

**Shams platform aims, according to its website, to achieve the following objectives:**

- Contribute to the quality of continuous learning.
- Improving the quality and accessibility of teaching and learning resources.
- Collaborate to develop creative digital content services and learning practices in the educational framework.
- To enhance cooperation in the design, development and quality assurance of open learning resources.

- Identify open learning best practices, products and processes that are outstanding through self-assessment and peer reviews.
- Encouraging researchers and developers to conduct studies and make proposals for improving the open learning resource system.

#### **5-4 9- Open Learning Resources**

OER is an acronym for the phrase (Open Educational Resources) which is educational resources that include video or audio lectures, free textbooks, computer programs, available to everyone as a common public domain, or as a public domain. Such resources are usually issued using a specific intellectual property license, which allows distribution and modification of these resources and cooperation with others to reuse them, or even for commercial purposes.

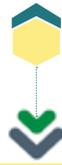


# Chapter 6

## Computer Viruses







## Computer Viruses

### Objectives

#### ➔ Main objectives:

1. Learn about the types of risks that threaten computers and data.
2. Learn about viruses in terms of mechanism of action and how to infect and deal with viruses.
3. Learn about data protection methods

#### ➔ Sub-Objectives

After studying this chapter, the student is expected to master the following knowledge and skills:

1. Learn about the different types of risks that threaten computers and data
2. Learn about computer viruses and list their types.
3. Learn ways to protect data on computers and networks.
4. Learn the working mechanisms of viruses.
5. Learn to categorize different types of viruses.
6. Learn the methods of infection with viruses.
7. Learn the most common viruses
8. Learn ways to prevent viruses and how to get rid of them.
9. Learn the ethics of using a computer to protect data.



## 6 -1 Introduction to Computer Viruses

In the recent period with the development of computers and networks, the risks to the computer have increased, and among these types of risks are malicious programs and computer viruses. The virus is a program that was developed by programmers and is intended to harm or control the computer. The damage to the computer varies, including what destroys the computer by damaging the hard disk, including what damages part of the data.

Definition of a computer virus: a program that has the ability to spread between different computers by hiding itself in an application file or program, and it aims to infect the computer with specific undesirable damages.

Computer viruses are so called by this name because they resemble vital viruses, which are the microorganisms that transmit diseases to humans, including:

- Viruses always disappear behind another file, and when the infected program is run, the virus is run.
- Viruses are present in a basic place on the computer, such as the disk and memory-operating sector, and infect any file that is running while in the hard disk or memory, which increases the number of infected files.
- Sometimes the biological virus and the computer virus change their shapes to make them difficult to detect and overcome.

### Skill 6 - 1

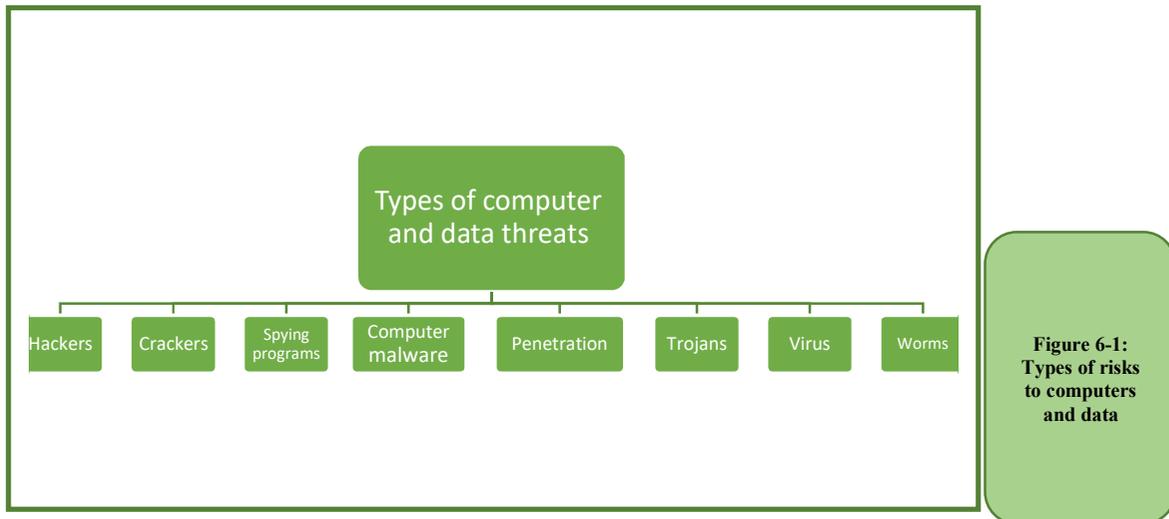
Knowing about the types of risks that threaten computers and data.



## 6 -2 Types of Computer and data threats

Almost, the computer on the Internet is not free of threats and risks, including hacking, spyware, hackers, and malware.

The risk is a threat to information inside the computer with a security vulnerability. Figure 6- 1 shows the types of risks that threaten the computer and data. This chapter will present some of these types.



### 6 -2- 1 Penetration

Penetration is the ability to enter information inside the computer illegally. The main reason for the penetration is the use of the Internet, with gaps in the system’s protection system. Among the most important drivers of penetration:

- Obtaining money by stealing bank information.
- Obtaining personal information for the purpose of blackmail.
- Get secret email spy codes on personal messages.
- Obtaining the password for a website in order to destroy it or change its content.

### Types of Penetration:

*The types of penetration in terms of the method used are divided into three types:*

- Penetration of servers of companies or government agencies by penetrating the firewalls that are usually placed to protect them.
- Hacking personal devices and tampering with the information, they contain.
- Exposing data during its transmission and identifying its code if it is encrypted. This method is used to reveal credit card numbers and to reveal bankcard numbers ATM.

### 6 -2- 2 Spyware

Spyware is software that aims to collect personal information about an individual or organization without their knowledge, which may cause data theft and slowdown in the computer. The stolen data can be passwords, for example. Methods of infection with spyware:

- Through electronic chat sessions.

- Through the Email.
- When downloading programs or files from untrusted sites.
- By using infected volumes.

### **6 -2- 3 Hackers**

Hackers are ComputerExperts, who access hacked information, and they are intruders who challenge the security of network systems but the vast majority of them do not have sabotage motives.

### **6- 2- 4 Crackers**

Crackers are people who are computer professionals or experts but who do illegal or legal activities, such as making a program for the purpose of theft, or making a program to obtain information in illegal ways.

## **Skill 6 - 2**

**Knowing about the types of malicious programs and their characteristics**



### **6 -2- 5 Malicious Computer Programs**

Malware is a small program that is insert into the computer system to damage it or destroy it. The risk may be simple to a defect that cannot be repaired except by scanning computer data, and they are several types, including viruses, worms, and Trojan horses. Figure 6 -1 shows these malicious types in terms of malware.

**1. Worms:** They are programs that reproduce themselves but do not contaminate other programs. They were made for the purpose of sabotaging or stealing data from computers during connection to the Internet, which is fast spread and difficult to get rid of.

#### ***Among the types of worms:***

- Mail worms: They are attached to the message content and most types of these worms require the user to open the attached file in order to infect the device.
- File-sharing software worms: They spread by placing themselves in the sharing folders so that they spread among other computers.
- Internet worms: They transmit over the TCP / IP protocol.

#### ***Among its characteristics:***

- Fast spread across networks.
- Diffused as an email attachment.
- It sends a copy of itself to other computers.
- It has remote execution capability.

- It has the ability to log in remotely.

**2. Virus:** Virus is a small program, which is programmed with the purpose of damaging the computer, moving from one computer to another, and also copies itself inside the device, interferes with the computer's operating system, and is programmed by professional programmers to ruin it, and damage to computers, or to achieve financial gains.

**3. Trojan Horse:** It is part of a program that is intentionally hidden inside a desired program section. When the user runs one of these programs, he activates the Trojan horse and does certain job that was designed for him. The Trojan horse can perform malicious or benign actions.

***Most Trojans share the following characteristics:***

- It has the ability to disappear.
- It works from a distance to steal data.
- It has powerful frauds. She has an unspoken skill to defraud.
- Automatic connection of computers via the network.
- Has the ability to self-repair.

### Skill 6 - 3

Knowing about Data Security and advice to consider.



## 6.3 Data protection

The rapid spread of the computer and the Internet has created many problems related to how to protect data and provide the necessary security for it from viruses, malware, hackers, and others.

Owning the latest security technologies alone is not sufficient to guarantee comprehensive protection for programs, devices and data, but there is a set of preventive procedure, and things that all computer users must know in order to be safe from viruses and hackers.

### ***6 -3 -1 Elements of information security***

Basic principles of information security Information security and protection depend on a set of basic principles that must be observed during the taking of procedures and measures necessary to protect information. The elements of information security are as follows:

1. Secrecy: means ensuring that information on the computer system is only accessible to authorized users.

2. Integrity: means ensuring that the information content is correct and has not been modified.
3. Continuation of availability: means the availability of the information system for authorized users.
4. Protect computers and protect computer networks from potential hazards.

### **6-3 -2 Computer protection**

Computer protection is a set of procedures to protect computer data and equipment. Computer protecting achieved by:

- Using a strong password.
- Using a firewall.
- Using antivirus software.
- Installing antivirus software.
- Updating antivirus software on a daily basis.
- Running an antivirus program on a daily basis.
- Updating the operating system constantly.
- Backing up files: backup important data to an external disk.

### **6-3 -3 Protection of the internet**

When a computer connects to the Internet, it is at risk. The risk includes stealing information, publishing information, or any other harm. Personal protection on the Internet is divide into two parts:

- Safety.
- Security.

**Safety:** It is the provision of protection to ensure the safety of the user himself from exploitation, extortion, violation or abuse. Security is the provision of protection to ensure the security of information, data and personal privacy. It includes file and hardware protection.

Internet Protection: A set of procedures to protect data within the Internet, including:

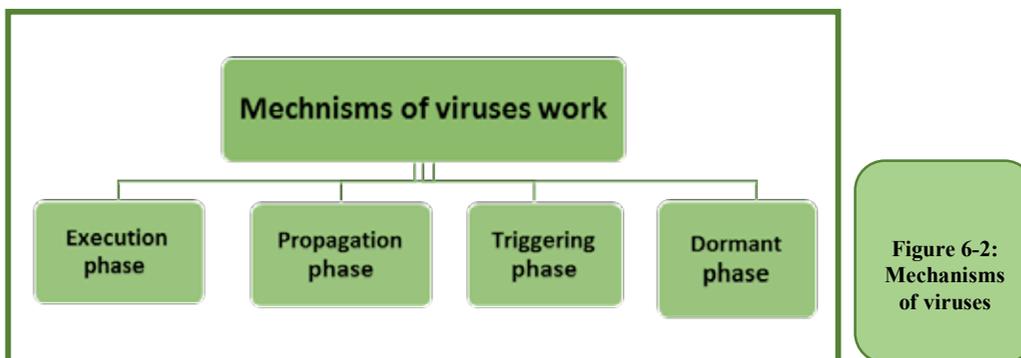
- Use of secure networks.
- Use trusted sites.
- Network Security: Ensure a strong password.
- Avoid websites that provide pirated material.
- Keep personal information secure.
- Do not use an open Wi-Fi network: Do not use an open Wi-Fi network. A malicious person can access data through the device.

**Skill 6 - 4**  
Knowing the mechanisms of viruses.



**6- 4 Mechanisms of Viruses**

The mechanism of virus work is divide into four main stages: the passive stage, the launch phase, the spread phase, and the implementation phase. Figure 62- shows these mechanisms of virus work.



After the virus program can infect a device, it enters the dormant phase in which the virus is inactive, but not all viruses have this stage.

Then, if certain conditions areavailable, such as a specific time or operation of a specific application, the virus begins in the triggering phase, where the virus is hidden in another program and is active with it, to perform the function for which it was made.

Most viruses pass through the latency stage immediately after infection, the damage does not appear on new infected programs, allowing the virus the time necessary to copy itself without noticing it.

Then the propagation phase iscoming, where the virus launches and adds its code to the original program and modifies its instructions so that the implementation moves to the virus code and when the infected executable is run, at which point the virus is active and the device is infected. The infected program becomes a source of infection and infects other programs.

In the execution phase, the virus is spread through files and the computer system.

## Skill 6 - 5

Classify the viruses according to the target or hiding strategy.

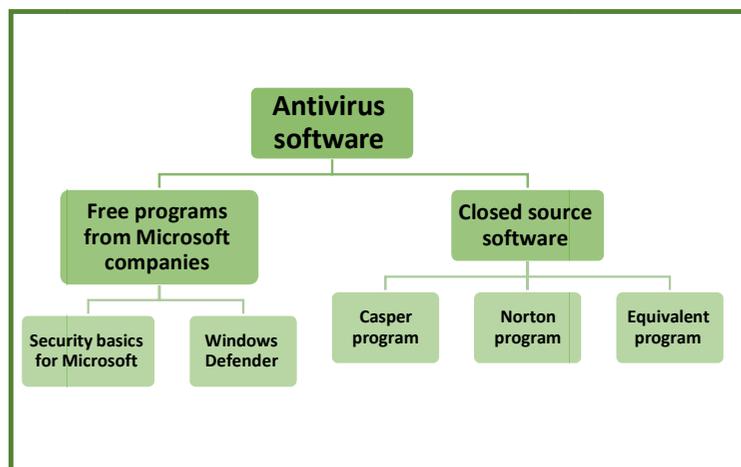


### 6.5 Classification of viruses

*Viruses are classified into several categories.*

- In terms of rapid spread, there are:
  - Fast-spreading, and
  - Slow-spreading viruses.
- In terms of timing of activity, there are:
- Viruses that are active at specific times, and Perpetual viruses.
- In terms of the location of infection, viruses infect a specific part of the computer, such as the operating sector virus.
- In terms of the size of the damage, there are destructive viruses for devices, such as the virus, that harm memory random access in the computer.
- There are harmless viruses that do not harmful for work.
- Depending on the target, which is a variety of viruses, each with specific features and attributes, such as macro viruses that infect documents in a Microsoft Office package.
- According to the hiding strategy such as encrypted viruses.

Generally, viruses classified into two classes, either by target or cache strategy. They classified into a variety of viruses categories, each one with specific attributes and characteristics. Figure 63- shows these types.



**Figure 6-3:**  
Types of anti-viruses

### 6.5.1 Classification of viruses by purpose

*Viruses classified according to the goal into three types.*

1. **File Infector Viruses:** This type of virus attaches itself as a file in any executable program, infects the executable in the volume and it inserts the infected code into an executable file, and it is spread across disks or across the network.
2. **Boot Sector Viruses:** These are viruses that infect the basic boot program on the disk (Boot Sector), and destroy its contents, which leads to the inability of the computer to boot or run and is considered one of the most dangerous types as it leads to the computer stopping work.
3. **Macro Viruses:** They are rapidly spreading among users especially that it is able to spread in all ways such as mobile and compact discs, email and free programs, they are viruses that infect application programs such as word processing macros and laziness macros. Macro viruses are characterized by many forms to comply with all files.
4. **Denial-of-Service (DoS) attack** Denial of service attacks are not a modern method, but the Internet has made them deadly and means that a group of computers attacks a single server with a very large set of commands that outperform the server's ability to Treatment in order to block the service.

*From the types of DoS attacks:*

- Attacks that exploit the Bug in TCP / IP build
- Attacks that exploit the default TCP / IP specifications
- Attacks that block traffic to your network so that no data can access or leave it.

To protect the computer from DoS, use (Dos.deny), which is a system designed to detect and respond to DDOS and prevent it from affecting the performance of servers or sites that use this system.

### 6.5.2 Classification of viruses according to the concealment strategy:

1. **Encrypted Virus:** A virus that uses encryption to hide itself from antivirus software. Encrypted viruses create a random encryption key that is difficult to detect by antivirus software.
2. **Stealth Virus:** designed to hide itself from an antivirus program, and it works on a strategy to hide itself in files where it displays a clean copy when scanning files, and works to change the properties of the hidden file.
3. **Polymorphic Virus:** a virus that is difficult to detect due to its transformation

with every infection, and it works on a strategy to use encryption to maintain itself.

4. **Metamorphic Virus:** transforms and rewrites itself at every repeat, making it more difficult to detect, and working on a strategy that changes its software, and reassembles itself into an executable form.

### Skill 6 - 6

Knowing ways of transmitting viruses and their symptoms..



## 6- 6 Modes of transmission and symptoms of viruses

Most viruses today are transmitted using the Internet unless protection systems such as firewalls and virus protection programs are used, secondly storage media such as optical disks and mobile memory and thirdly in mail messages.

The computer virus is transmitted according to the method of spreading into two types: the direct infection virus and the indirect infection virus:

1. Direct Infector: When a program or file infected with a virus of this type is execute, that virus actively searches for one or more files to transmit the infection to it, and when one of the files becomes infected, it loads it into memory and runs it.
2. Indirect Infector: When an infected program or file is execute with a virus of this type, that virus will transfer to the computer's memory and settle in it, and the original program will be executed and the virus will infect every program that is loaded into memory after that. Until the computer is cut off and restarted.

### *Among the most important methods of infection with viruses are*

- Open attachments from unknown and virus-infected emails.
- Download free programs from malicious websites.
- Anonymous ads online.
- Use of mobile volumes: Volumes such as portable and optical disks transmit viruses if inserted into an infected device.

**Skill 6 - 7**

Count the symptoms of infection with viruses.

**6- 7 Symptoms of Infection with Viruses**

When running the program infected with viruses, it may infect the rest of the files with it on the computer, and the virus needs intervention from the user in order to spread, of course the intervention is to run it after it was brought from the mobile disk or compact lending or via e-mail or the Internet.

***The most common symptoms of computer virus infection are***

- The computer slows down without any reason.
- The computer system contains less available memory.
- Creation of unknown programs or files.
- Some programs or files are lost.
- Some files are damaged.
- Restarting the computer in unusual ways.
- Some files or programs do not run correctly automatically.
- Display strange messages, music or sounds.
- Change the name of the hard drive or volume name.
- Inability to deal with some terminals such as CD and printers.
- The entire system collapses and the device is unable to operate.

**Skill 6 - 8**

Knowing ways to prevent viruses.

**6 -8 Methods of virus protection**

***To protect the computer from the risk of infection with viruses, the following steps should be followed:***

1. Install antivirus software.
2. Keep your antivirus software updated on a daily basis.
3. Scheduled checks should be done regularly with antivirus software.
4. Make a backup copy of the important data periodically to take advantage of it when the computer is infected can be retrieved.
5. Update the operating system.
6. Do not use an infected flash memory.
7. The Internet use is regulated.

## 6 -9 VirusesMonths

The emergence of viruses began to spread in the mid-eighties of the last century and since that time, it has evolved and started spreading abundantly, and at the end of the 90th the number of famous viruses reached thousands of viruses and it is increasing every day. Among the most famous viruses that spread quickly are:

### 1. *Melissa Virus*

Melissa Virus was the first virus to be transmitted via e-mail, and this matter was very frightening, as the prevailing belief at that time was that viruses could only be used if a user opened one of the files carrying the virus and attached to an e-mail.

### 2. *Melissa Virus*

One of the fastest viruses that spread in 1999. It is a cunning type of viruses, specializing in email infection. It spreads by sticking to text programs as an attachment in the email message and once the user opens the file attached to the message only the virus begins to work as it can access the list of the user's private message begin to sends the same message to the first fifty addresses without your knowledge and continues to spread.

### 3. *SoBig Virus*

An anonymous email message that crashes computers when they open. This virus disrupted Newsweek when it first appeared in 2003.

### 4. *Sasser Virus (SASR)*

In May 2004, the virus infected 3.17% of the worldwide computers that run Windows operating system through the internet. This virus causes a delay in executing the commands that are given to the device and also closes the machine and reopens it.

### 5. *Love Virus*

A destructive computer worm that is spreading rapidly hit computers in 2000, exploiting a vulnerability in the Windows system and a weak e-mail system, but it specializes in infecting Microsoft Outlook's email management program and is characterized by its rapid spread

### 6. *MyDoom Virus*

A type of virus that attaches to an e-mail as a text file and re-sends itself to other e-mail addresses, as it spreads through music files, movies, and games over the Internet. The virus introduces a program that allows hackers and hackers to enter the computer and register everything that was printed starting from the

password to credit card numbers. This virus infected about millions of computers when it appeared in 2004.

### 6 -10 Antivirus software

Many anti-virus programs are available and can be used to fight viruses, worms, and Trojans. The antivirus program examines the computer for new viruses that have been infected and then clean these viruses to ensure that no more harm is done to the computer. Anti-virus programs become useless facing new viruses unless the programs are updated from the company's producing website. Antivirus programs are divided into free programs from Microsoft, such as the basics of Microsoft's security and Microsoft's security, and closed source (non-free) programs such as Casper, Norton and McAfee. Here and later Microsoft anti-virus software are introduced. Figure 6-4- shows the classification of these programs.

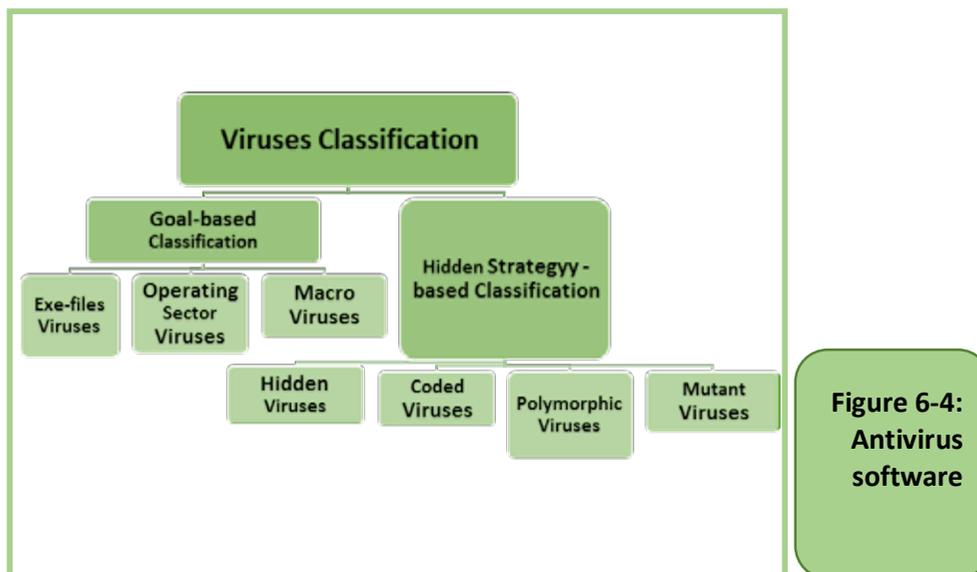


Figure 6-4:  
Antivirus  
software

#### 6 -10 -1 Mechanism of Antivirus Working:

*The following steps explain how antivirus work and how to get rid of viruses:*

1. A virus is created and launched.
2. The virus infects a few computers and is sent to the antivirus company.
3. The antivirus company records a signature of the virus.
4. The company includes the new signature in its database.
5. When an antivirus scan is performed, the virus is detected, and the virus risk is reduced.

#### 6 -10 -2 Microsoft antivirus software

A free software from Microsoft and provides computer protection from viruses, spyware and malicious files, and it includes two programs:

- Security basics for Microsoft Windows 7 and Windows 7.
- Windows Defender, which works with Windows 8 and above.

### Skill 6 - 9

Identify and use Microsoft Security Essentials.  
Microsoft Security Essentials.



#### **Firstly: Microsoft Security Essentials**

Microsoft Security Essentials is a free anti-virus program for devices running the Windows operating system. The anti-virus program was produced by Microsoft. Its mission is to protect the computer from the dangers of viruses, malware, and hacker attacks.

#### **1. Features of the protection program - Microsoft Security Essentials**

- A free program is downloaded directly from Microsoft, easy to use, and works very efficiently on the Windows operating system without stopping to keep the system protected from any threat.
- Provides a quick scan of the computer.
- Provides a complete scan of all files and programs.
- Provides a custom examination that includes the part to be examined.
- Fast and provides instant reports in case of danger to the device.
- The update process is done automatically.

#### **2. Check the system**

The Security Basics program provides Microsoft Scan options with Quick Scan, Full Scan, and Custom Scan. Figure 66- shows the scan options.

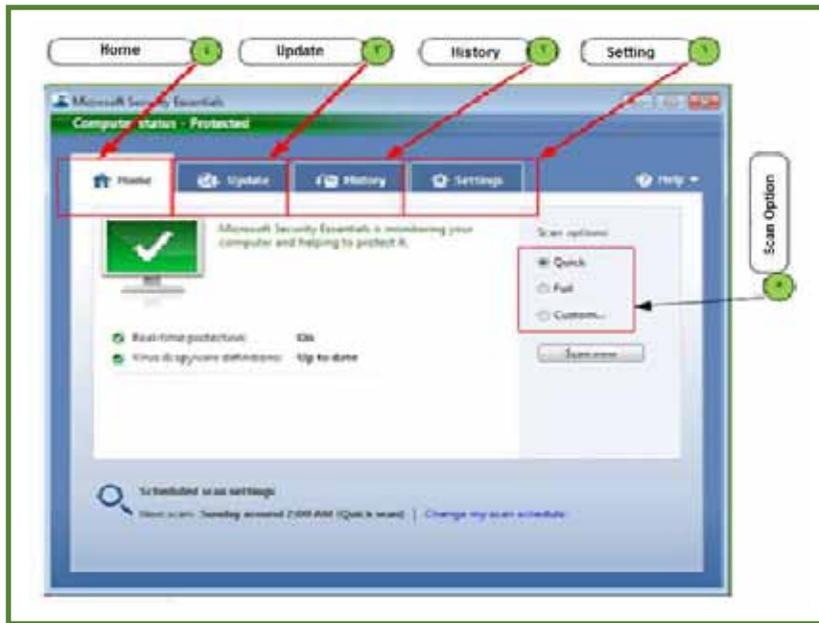
- Quick Scan: Quick Scan searches the places on your computer's hard drive that are most likely infected by malware.
- Full scan of the device: The full scan searches for all files on the hard disk and in all programs currently running, but it may cause the computer to slow down until the scan is complete.
- Custom Scan: Here you can choose the part of the data to be scanned.

#### **3. The home page of the Microsoft Security Essentials program**

It contains the settings icon for the system and an icon that shows the history of the checks that were performed on the system, and it contains search options, which are fast, full or custom searches, it contains icons that display the security status of the computer in the form of a green, yellow or red icon,

**a . Green icon**

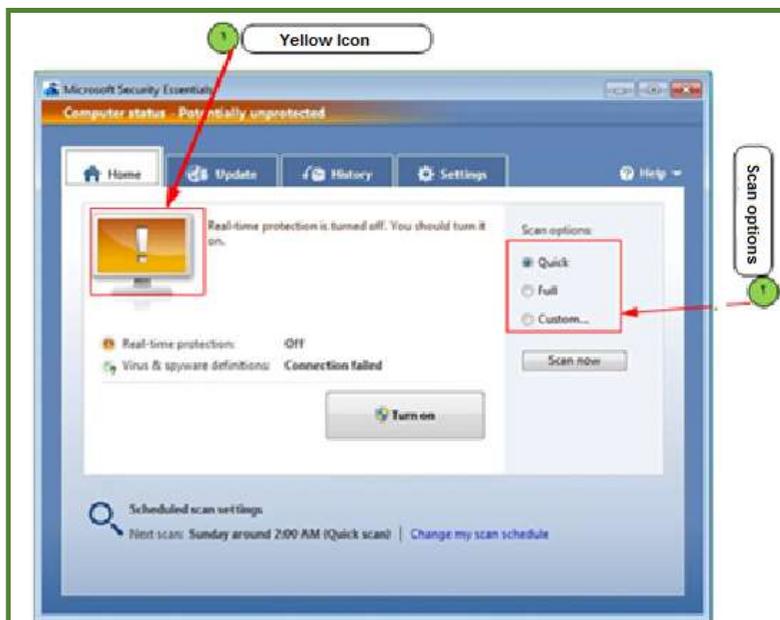
This means that the computer’s security condition is good, when the computer faces a lower threat, it will turn from green to yellow. Figure 6.5 shows that the symbol is green, which means that safety conditions are good.



**Figure 6-5**  
Microsoft Security Home Page

**b. Yellow icon**

Means that the situation is not protected, and that protection must be run in real time, or a system scan must be performed, whether it is fast, complete, or ad hoc. Figure 6- 6 shows the yellow icon and the user should scan for and remove viruses.



**Figure 6-6:**  
The status is not protected in Microsoft Security

**c. Red icon**

The appearance of red means that the computer is in a very dangerous stage and that the program must be run to remove the danger. Figure 67- shows the red symbol meaning that the computer is in great danger and the computer must be checked and the threat removed.

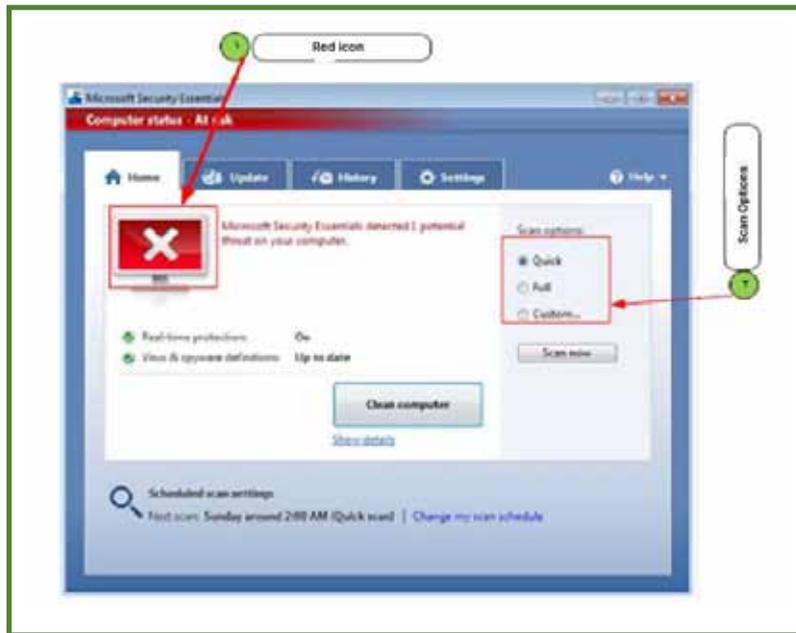


Figure 6-7:  
The situation is in danger in Microsoft Security

**Skill 6 - 10**  
Defining and Using Windows Defender



**Secondly: Windows Defender Program**

Windows Defender is an alternative to the Microsoft Security Essentials program that works to achieve protection for computers running Windows newer than Windows 8. As it is considered Windows Defender is one of the necessary and important programs that in turn protect files and get rid of harmful programs.

**1. Windows Defender program features**

- Provides periodic updates.
- Provides complete computer protection from viruses and spyware.
- Cleans the computer from malware and useless files.
- Effective protection while surfing the Internet.
- Easy to use user interface.
- The user interface supports multiple languages.
- Compatible with all modern Windows versions of Windows 8 and above.
- The program is free and available to all Windows users.

## 2. The main screen of the Windows Defender program

The main screen of the Windows Defender program contains a set of icons that indicate the security status of the computer in the form of a green, yellow, or red icon, depending on the case. Figure 6 -8 shows these elements.

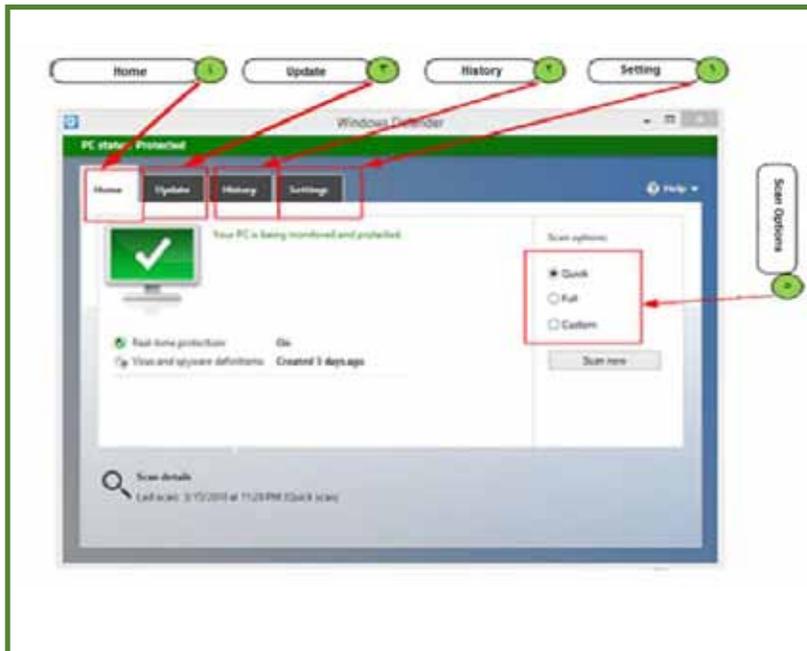


Figure 6-8  
Basics of  
Windows  
Defender

## 1. How to use Windows Defender

There are several scanning methods provided by Windows Defender. Figure 6- 9 shows this.

### v Full scan, custom scan and quick scan.

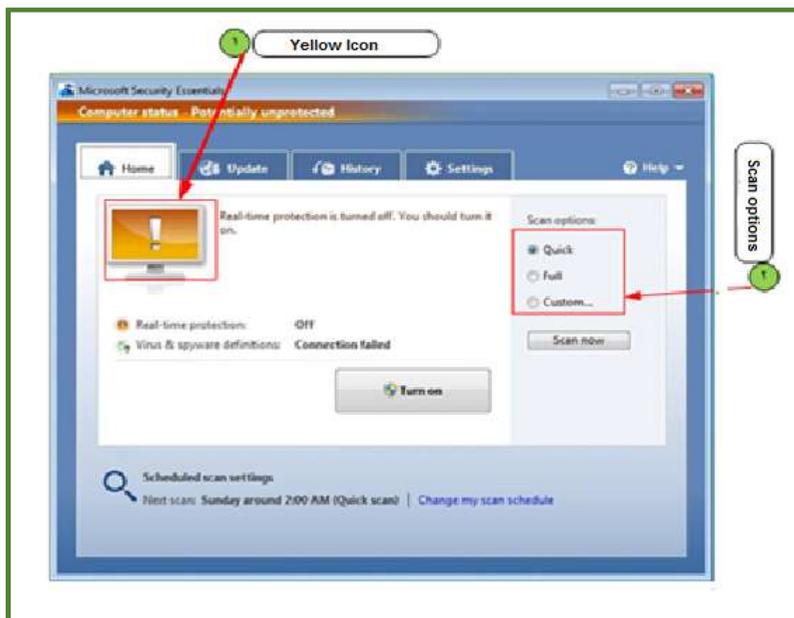


Figure 6-9:  
The status  
is not  
protected in  
Windows  
Defender

**a. Green icon**

Green icon shown in Figure 68-, means that the computer security condition is good, up to date, and works in the background to help protect the computer from malware and other harmful threats.

**b. Yellow icon**

Means that the condition is potentially unprotected and some actions can be taken, such as turning on real-time protection or performing a system scan as shown in Figure 6- 9.

**How Microsoft programs to remove viruses**

To get rid of viruses the program does the following

- Step 1: Scan for viruses.
- Step 2: remove the virus and get rid of it, and if that is not possible, we use the "Format" device.

**Skill 6 - 10**

Learn about computer ethics and the most important commandments of computer ethics.



**6- 11 Computer Ethics**

Computer ethics is the way to deal with computers, it concerned with the moral and legal aspect. Computer ethics is used to describe the ethical principles that govern the process of computer use, which include ethical issues such as intellectual property rights (copyright, copyrights, patents) facing today's computer and information-based society.

The ethics of using a computer are many and varied, three main things that a computer user must know while dealing with it, including:

**o Ethics of using a computer between a person and himself.**

Among the ethics that must be characterized by the individual in this case is not to do things that negatively affect him, such as wasting time, and seeing the privacy of others.

**o Ethics of using a computer between a person and a third party.**

When working on a computer and the Internet, one should respect individual property, not steal other people's business, preserve the privacy and secrets of others, and not to others.

***o Ethics between the user and the device.***

It means maintaining the computer and complying with the laws that were put in place to benefit from its use.

Among the commandments of computer and Internet ethics, there are many ethics that a computer user must have.

- It is not permissible to use a computer to harm others.
- It is not permissible to spy on other people's data.
- It is not allowed to use the computer to carry out theft and fraud.
- It is not permissible to use a computer for forgery in documents or data.
- It is not permissible to use other people's computer resources without their permission or authorization.
- The computer should be used with interest and respect of the privacy of others.
- Commitment to confidentiality, pledges, agreements and labor laws.
- It is not permissible to copy other people's software and use their files without approval or without paying for these programs unless they are free.
- It is not permissible to use the Internet to send messages that are harmful to others, to interfere with their files, and to disable their devices.



# Chapter 7

## E-COMMERCE







## E-COMMERCE

### Objectives

#### ➔ Main objectives:

1. The concept of e-commerce.
2. The fields of e-commerce and its importance.
3. The various payment systems that are used in e-commerce.
4. the infrastructure that supports e-commerce

#### ➔ Sub-Objectives

After studying this chapter, the student is expected to master the following knowledge and skills:

1. Learn about E-commerce.
2. Differentiate between stereotyped trading and E-commerce.
3. Lists the areas of use of E-commerce and its importance.
4. Explains the payment systems used in E-commerce.
5. Shows what infrastructure supports E-commerce.



## 7 -1 Introduction to E-commerce

With the huge developments in computer networks and the increasing spread of the Internet, which now covers most parts of the world, the concept of E-commerce has spread. E-commerce is one of the modern concepts that have entered into our daily life and it has even become used in many life activities related to shopping, selling, buying, activities and other commercial operations electronically.

The concept of E-commerce has emerged since the beginning of the seventies of the twentieth century, as American companies started to use special networks that link them with their customers and businesses to facilitate their daily business and support sales operations. In the same period, the concept of electronic data interchange appeared which transferred the application of the concept of electronic commerce from mere financial transactions to the rest of other commercial transactions, as the technology extended from financial institutions to the rest of commercial institutions.

E-commerce includes marketing operations, procedures for buying and selling goods, and exchanging products, services and information through computer networks, the Internet, and the Internet, which provided many advantages. For example, it has become possible for traders to avoid the hassle of traveling to make deals, meet their partners and clients, and shorten time and money by using the Internet to promote their goods and display them in the markets. As for customers, they do not have to move a lot to get what they want, or to stand in a long queue, or even use paper money, as it is sufficient to acquire a computer, an Internet browser program, and an Internet subscription to get what they want and pay later.

### Skill 7 - 1

Defining E-commerce and its main operations.



## 7- 2 Definition of E-commerce

*In fact, there are many definitions of e-commerce, including the following definition- :*

“Electronic-Commerce” is the process of selling, buying or exchanging products, services and information using electronic media such as internal and external computer networks as well as the Internet”. Thus, the components of E-commerce are numerous, as shown in Figure 7 -1

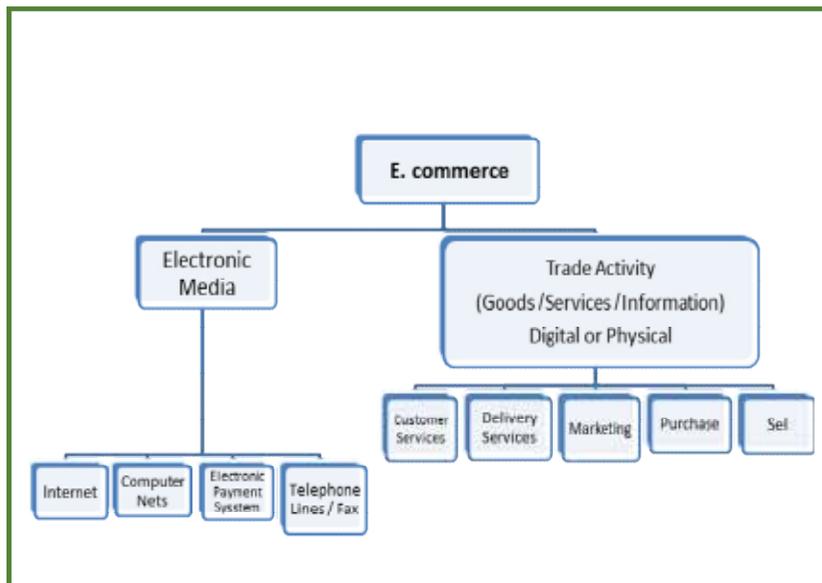


Figure 7-1:  
Ecommerce  
components

E-commerce can be defined also, according to the World Trade Organization “E-commerce includes activities to produce, distribute, market, sell, or deliver goods and services to the buyer through electronic media“.Thus, commercial transactions according to this definition include three types of operations:

1. Product advertisements and searches.
2. The processes of submitting the purchase requisition and paying the purchase price.
3. Procurement deliveries to clients.

The information technology or information industry in the era of computers and communications supported the real existence of E-commerce and enabled it to spread widely as it depends on multiple means. Some of which were known before and used long ago such as telephone, TV and fax, some of which are more modern and advanced such as computers and the Internet for implementation and business management.

As a result of the E-commerce spread, the digital economy has evolved, which is based on both E-commerce and information technology.

### Skill 7 - 2

Showing the advantages of E-commerce



### 7- 3 Advantages of E-Commerce

From the above definition, it is clear that E-commerce does not differ from traditional trade except in how it is implemented and applied. E-commerce uses

an unconventional method to reach customers all over the world, as well as in completing procedures or processes, which makes them achieve many advantages, including:

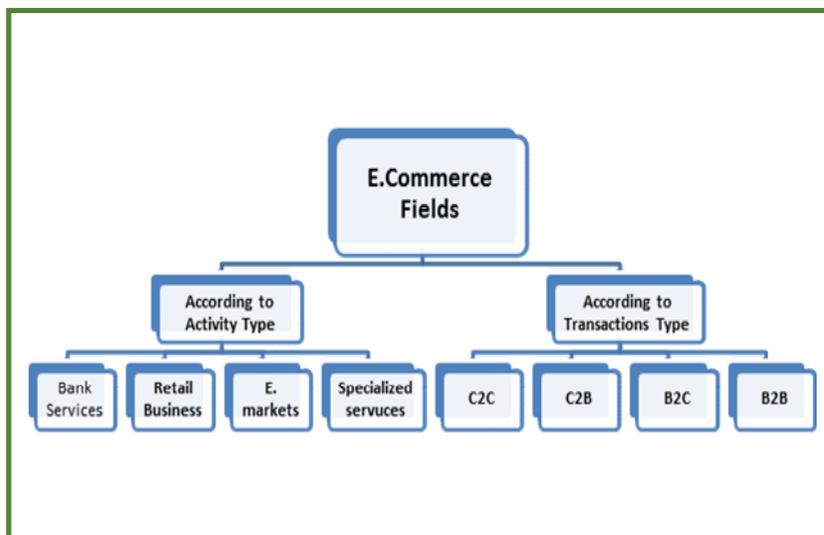
1. Achieving huge gains: met with a significant decrease in costs compared to traditional trade.
2. Better management of operations: such as purchase, supply, sale, transportation, insurance, accounting operations, and inventory control.
3. Reducing the cost of commercial transactions: Because it eliminates the role of intermediaries between the seller and the buyer by providing accurate information about the two parties.
4. Effective communication with partners and customers: E-commerce crosses distances and borders, providing a fast and effective way to exchange information with partners wherever they are.
5. Saving time and effort: E-markets open continuously throughout the week and all the time, and customers do not need to travel or wait in the queues to purchase a specific product, as they do not have to transfer this product to the home. Buying a product requires no more than clicking on the product, and entering some credit card information.
6. Freedom of choice: E-commerce provides a wonderful opportunity to visit various types of stores on the Internet; in addition to that, it provides customers with complete information about the products. All of this is done without any hassle or crowd.
7. Reducing prices: The Internet provides many companies that sell goods at a cheaper price compared to traditional stores, because online commerce saves a lot of costs associated with traditional trade.
8. Satisfying customers' needs easily: The Internet provides direct interactive communications, allowing companies in the online market to quickly respond to customer inquiries, which provides better services to customers and captures their satisfaction.
9. Open global markets: E-commerce has transformed the world into an open market for the consumer, regardless of the geographical location of the seller or buyer, which achieves higher returns than traditional activities.

**Skill 7 - 3**  
Listing the E-commerce domains



**7-4 E-commerce fields**

Due to the availability of multiple advanced tools for use, it has become possible to practice and implement E-commerce in several areas. Figure 72- shows the most important of these areas:



**Figure 7-2:**  
E-commerce fields

**7-4 -1 E-commerce according to the nature of the activity**

E-commerce include according to the nature of the activity provided by handling many of the different processes and activities, which can be categorized in the following areas (as Figure 7. 2):

**1. Electronic banking services**

Electronic banking services is one of the oldest areas covered in electronic commerce, which includes any activity directly related to facilitating electronic commerce operations. Which currently includes the completion of most financial deals electronically, banks also provide other electronic services, including querying the account, tracking stock prices, and buying and selling stocks. Saudi Arabia is one of the prominent countries where e-cards are relied upon to complete many deals. Most Saudi banks also offer payment of various types of billing service as well as purchases or conversion of different currencies through the Bank’s website.

**2. Electronic retail business**

Many websites on the Internet sell various products to clients around the world was deployed. They sell books and magazines, allowing buyers to search

for the book's name or required content and know the price. After that, the payment process is done electronically and then delivery is done either through the publisher or through a broker who handles delivery.

Through Ecommerce, not only you sell books and magazines, but also it spread widely involving food commodities, clothing and perfumes, various devices, and others could be bought. Here, the sellers through these sites practice the retail activity of different commodities and products.

### 3. Electronic markets

An electronic market is characterized by the fact that the trade center will not be a building or a place but rather a website on the internet for conducting commercial transactions. Participants in electronic markets - sellers, buyers and brokers - are not only in different places in the world, but they rarely know each other. The methods of communication between individuals in the online market differ from one person to another and from one case to another.

Currently, there are new and innovative markets in the Arab world that did not exist before, and include many areas, both in the automotive field such as SellAnyCar.com, and in the field of catering services such as ReserveOut. To provide easy restaurant reservations, as well as Hello food, an online food ordering service that allows customers to order food from their favorite restaurants with a meal delivery service for them. Figure 73- shows an example of some of those electronic market sites.

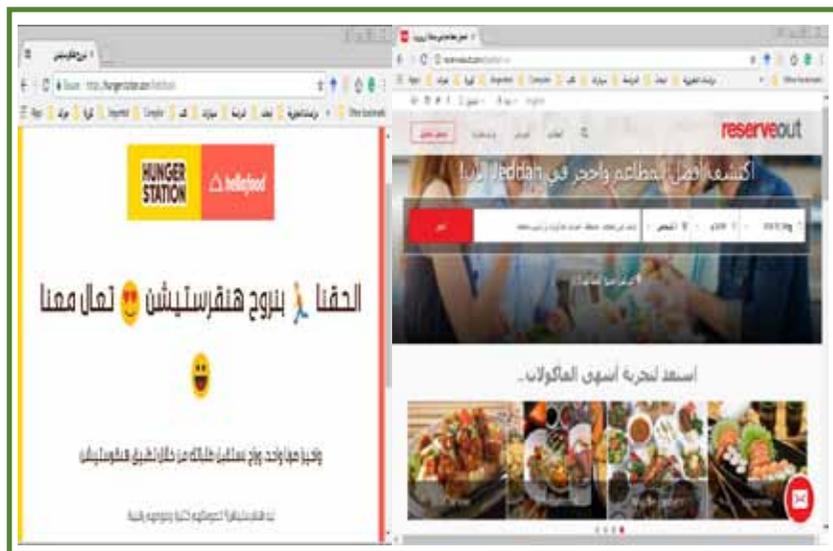


Figure 7-3:  
Examples of  
electronic  
markets

### 4. Specialized electronic services

Specialized services include all types of consulting and services, whether educational, medical, accounting or software, which have become widely available

via the Internet, as many sites currently provide services such as legal advice, educational lessons, or medical prescriptions...etc.

There are also digital products that can be delivered electronically as specialized commercial websites have emerged that provide small software, rare photos, e-books, games, video sites, movies, and others. These products are called digital products because the buyer can obtain them electronically, which are sent either by e-mail or through any other means of technology. There are goods and services that cannot be delivered electronically, but they are delivered to the consumer separately through delivery companies. The electronic stage of these deals is a kind of distribution service.

### **7-4-2 E-commerce according to the nature of the transactions**

E-commerce includes, according to the nature of transactions, some other fields mainly related to how to determine the parties to the commercial activity of electronic commerce transactions. Commercial transactions always take place between two parties (the two sides of the commercial transaction), and each relationship between those two sides reflects a different type of trade that differs from the other, and here is a simplified explanation of these areas:

#### **1. Business to Business -B2B**

B2B are the buying and selling operations that take place between companies. This type of electronic commerce is the most used type today either within the country itself or between countries. An example of this is the case of an internal company that has an electronic commercial link with a group of internal or external companies around the world. Thus, communication between companies is done electronically, so that the manufacturer can carry out the manufacturing process upon request, and the company receiving or requesting the commodity can receive the required materials at the appropriate time.

For example, Dell's Website for electronic devices offer selling devices to many customers, whether individuals or other companies around the world. B2b can be organized as a portion for the sales of small and medium-sized companies as well as for large enterprises as shown in Figure 7- 4.

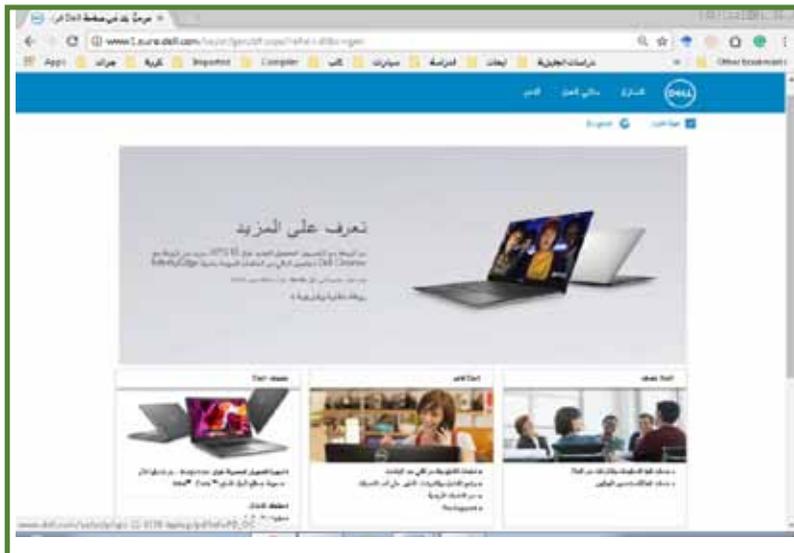


Figure 7-4:  
Dell  
Corporatio  
n Website

## 2. Business to Customer- B2C

B2C means sales of products and services from companies to customers. B2C is the most used and well known in E-commerce for ordinary users, where the buyer can choose the appropriate commodity and send the purchase request and then pay the value of the commodity via credit cards, or cash later when receiving commodity. B2c usually done through the company's website on the Internet. There will be a link to this site with a bank to facilitate payments from the customer, then payment through the broker, which is the bank. One of the most famous companies in this field is Amazon, which sells products to customers through its website. Alternatively, an Arabic shopping site that provides the service of the Amazon Arabic website as in Figure 7- 5.



Figure 7-5:  
Amazon  
and Arabic  
shopping  
site

### 3. Customer to Customer (Customer to Customer- C2C)

C2c means the sales and commercial transactions that take place between people and each other. Where the seller displays what he wants to sell on special sites on the Internet, such as auction sites owned by people or specialized companies in order to sell personal items, goods or experiences. Currently many sites provide such service to customers according to the goods to be sold (for example cars, furniture, etc.). The person who wants to buy must contact the advertiser directly, and then the deal is concluded. In this case, it becomes electronic transactions. Auctions website owners benefit from a value discount from the bidder when selling or posting the advertisement. For example, the site of Haraj in the Kingdom of Saudi Arabia, which is considered one of the distinguished sites in this field as shown in Figure 7 -6.



**Figure 7-6:**  
Haraj  
website

### 4. Customer to Business - C2B

C2B means that cases in which individuals or customers sell their products, which may be in the form of raw materials or goods used in manufacturing, as they may be in the form of various services provided to companies. This is done through communication with the sites of those companies or through e-mail to individuals. Companies make an announcement to request a specific service and customers provide that service to the company. Examples include sites providing remote work services and those looking for professionals to answer specialized questions or to perform specific tasks (such as designing websites, providing software solutions, etc.), (Upwork.com), which is one of the most popular sites

In this field, which provides opportunities for self-employment, through which companies (employers) can communicate with experienced workers for remote cooperation. Figure 7- 7 shows the home screen of the UpWork site.

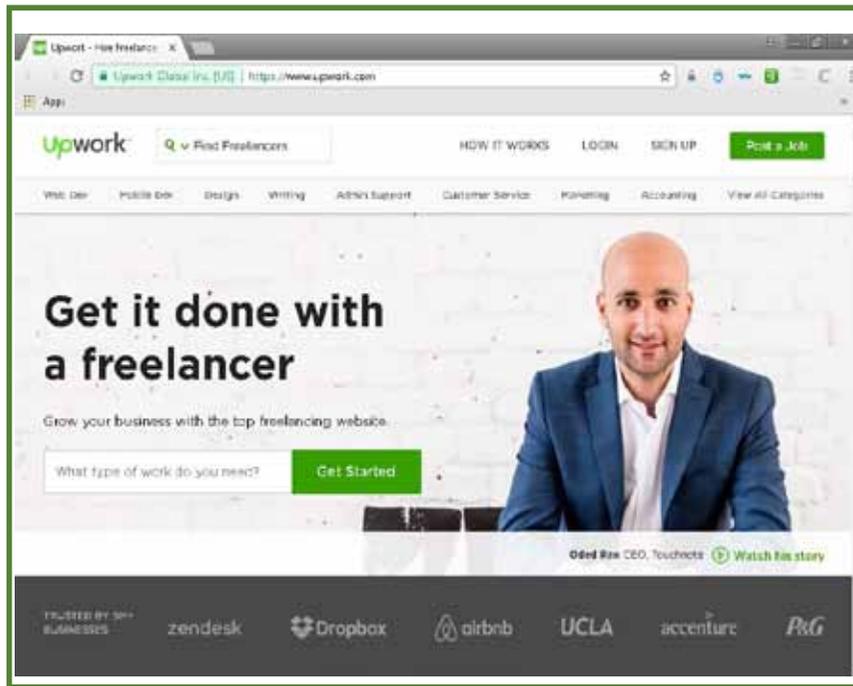


Figure 7-7:  
Site  
Upwork

#### Skill 7 - 4

Learning about the payment systems used in E-commerce.



### 7 -5 Payment systems used in e-commerce

The payment process is considered one of the most important and dangerous stages of implementing E-commerce operations. Many payment and payment systems have emerged, which the systems are provided by financial and banking institutions with the aim of making the payment process in electronic commerce safe and easy. These systems are characterized by being subject to a set of rules and laws that make all financial transactions and procedures take place in complete secrecy, to ensure protection and safety for users and in a manner that helps to facilitate E-commerce operations between different parties.

*Here is a simplified explanation of the most popular payment systems available:*

#### 1. Traditional Payment

Traditional payment is one of the oldest methods of payment and it includes cash or by editing a Cheque. Many customers who make purchases through the

Internet may hesitate to pay online or use their credit cards when paying for fear of stealing their account information or deducting their balances or withdrawing them entirely. Therefore, some sites provide traditional payments upon receipt through payment upon delivery of the goods, either by paying cash directly, or by sending a Cheque by traditional mail, or through a cash transfer.

### **2. Debit Card**

Debit card is a card issued by the bank, when the customer opens a current account (put money in the bank). The card is usually issued free of charge, and when it is used later for purchases, that is only within the available balance in the account, and the card cannot be used if the balance in the bank is executed, That is, its upper limit is according to the amount available in the balance. However, the bank may set an upper limit for the daily use of the card, even with sufficient balance, for security reasons (such as daily withdrawals or purchases in the range of 5,000 riyals per day), and when buying with the card, the amount is deducted immediately after the operation from the balance available in the account

### **3. Credit Card**

Credit card is a special card issued by banks to its clients with different financial capabilities, which is a loan that the customer pays as monthly installments with the imposition of taxes and interest at the end of the prescribed period. Credit card is considered the most used at the present time. Upon purchase, the card is required from the buyer (card number, name, expiry date), then the E-commerce site checks the card at its moment to ensure its validity and the availability of the required amount until the company has a guarantee that that customer has the ability to payment on purchase. Most of the banks and financial companies in the world issue credit cards, and the most famous of these companies are VISA, Master Card and American Express.

### **4. Bank transfers**

Because commercial operations are cross-border, many transactions may take place between parties in different countries, which requires transfer of funds between them, hence the importance of bank transfers, which is one of the types of services that banks provide now. This service allow customers to transfer money between countries. A bank transfer is a process that the customer requests from the bank with the aim of transferring a sum of money between two parties, and the other party is the beneficiary of this process, and this process can take place between the bank's own branches or between different banks around the world.

### **5. Bank accounts websites**

The websites of clients' accounts in banks are considered one of the most important means currently in the payment systems for electronic commerce operations, which is a service that is provided to customers through bank websites. Bank accounts websites allows the transfer of funds via the Internet between the parties, and is often used as a safe way to purchase over the Internet. For example, customers can currently, through their account with Al-Rajhi Bank, pay all bills and make purchases and payments. PayPal is one of the most famous websites that provide payment and purchase services, receiving balance and withdrawing it easily and easily in dealing with high levels of security, in addition to the world it is used in more than 200 countries around the world.

### **6. Electronic currency**

Recently the term electronic money (EC) is becoming popular around the world. EC is an electronic alternative to the traditional money that we used to trade. EC are currencies available only in digital form and circulated on computer networks, EC have no physical presence and take the image of electronic units stored in a safe place on secondary storage media (such as phone memory or hard disk), which is known as an electronic wallet, an example of digital money (Bitcoin currency, Ethereum, Latecoin, ... etc.).

Electronic payment systems must be characterized by flexibility and support for various payment models. There is no doubt that with the continuous development in E-commerce systems, there are more methods of payment that will appear and become more popular (electronic check, electronic wallet, electronic money, etc.)

#### **Skill 7 - 5**

Learning about the elements of electronic commerce infrastructure.



### **7 -6 Infrastructure supporting E-commerce**

E-commerce needs a special infrastructure to support its customers and operations. The infrastructure required for E-commerce includes computer networks with its various components, such as servers, connectivity devices, data communication lines, etc., and it also includes special software such as databases, protection protocols, electronic payment systems, and others. For E-commerce, transactions to be easy and easy there must be a strong infrastructure that supports this type of transaction. The following is a brief explanation of the most important elements of the infrastructure supporting e-commerce:

### **1. The Internet**

The Internet is one of the most important means that helped the spread and expansion of electronic commerce day after day, as the Internet provides important services in the field of electronic commerce for businessmen, suppliers and consumers. The Internet provides many means of communication between them, as well as the speed of communication between the company and its branches and its subsidiaries through various means of communication such as e-mail or Telnet voice service. It also enables consumers to view companies' products on their websites. He also was able to search for goods and services using search engines, which allows displaying all information related to the commodity and market and the laws for buying this commodity in other countries, which saves the trouble of traveling to know it and helps to select the best commodity and price among the offered prices.

### **2. The server or host computer**

Host computer is the server used to store and distribute data to other connected computers across the Internet worldwide. There are many server machines that sell their services to companies and individuals, who want to create and publish their commercial sites so that they are available to other users around the world. The server is the basis for creating and storing E-commerce websites and facilitating their operations.

### **3. Commercial Protection Protocols**

Commercial Protection Protocols is the infrastructure of the computer network (Internet), which requires a set of commercial protocols to organize the work and ensure safety, confidentiality, and continued flow of electronic commerce between the various parties. Among the most important commercial protocols related to network security:

#### **a. HTTPS Hypertext Transfer Protocol Security**

Hypertext Transfer Protocol (HTTP) is common when browsing websites that provide general information and that no sensitive data is transferred through it to and from the user. HTTP is easy to penetrate through it and detect that data sent. For the secure protocol (HTTPS) in which the last letter refers to the word (Secured) uses the Secure Sockets Layer Protocol known as the SSL, which ensures that the transmission of data inside the network is in a form of Secure and strictly confidential, this technology later called the versions of Transport Layer Security Protocol (TLS). TLS used in many major sites where confidential information is transmitted, especially those related to payment operations and the use of credit cards, through the encryption of data sent between the Internet browser and those sites.

**b. First Virtual Holdings**

This system allows the link between banks, companies that issue credit cards, companies that conduct business via the Internet and Internet customers. This system can verify the validity of the transfers and includes monitoring systems to detect problems and the effectiveness of the security of exchanging information during E-commerce operations.

**c. Net Cash**

Net Cash Protocol is a system used to pay for small transactions that take place during E-commerce. This system depends on coupons or electronic money that can be traded through the Internet. The bank issues these vouchers and transfers them to the beneficiary party for a small commission. Through this system, small payments can be transferred for amounts less than approximately \$100.

**d. Net bill protocol**

Net bill Protocol is a system that allows customers to pay their bills electronically by conducting electronic payments through the Internet, and many Saudi companies currently provide electronic billing service where customers can receive, view and manage bills online which is an environmentally friendly alternative to paper bills. Examples include Saudi Telecom Company (STC) and Saudi Electricity Company. As shown in Figure 7 -8



**Figure 7-8:**  
Sites that  
provide  
electronic  
invoice  
services

**e. Secure Socket Layers - SSL**

SSL is the system used with the https security protocol to transfer and encrypt payment data and other sensitive information safely between commercial sites

and customers, where all data is transferred to and from the customer's personal computer in an encrypted manner to be decrypted in the Internet server. The server encrypts the data before sending it to the client to the protocol is then decrypted.

***f. Secure Electronic Protocol-SET***

SET Protocol is a secure protocol that was developed by a group of international companies (Microsoft, IBM, Visa, MasterCard) to be adopted as a protocol for payment operations through information networks such as the Internet, for example the Saudi Network SPAN and others. Its purpose is to provide security for card payments when crossing the Internet from commerce and banking sites. As well as ensuring the security of data, its privacy and safety, in addition to verifying that it reaches the required authority in the payment process when conducting financial operations.



# Practical Part





# Chapter 8

## Windows 10







## Windows 10

### Objectives

#### ➔ Main objectives:

1. Knowing the main features of Windows 10.
2. Dealing with Desktop and Taskbar in Windows 10.
3. Dealing with folders and files in Windows 10.
4. Dealing with the Settings and Control Panel in Windows 10.

#### ➔ Sub-Objectives

The student is expected, after studying this chapter, to master the following knowledge and skills:

1. Recognize the operating systems and their main functions and types.
2. Explore the new advantages of Windows 10.
3. Recognize if the system requirements for installing Windows 10 are available on his PC.
4. Recognize the different versions of Windows 10.
5. Recognize the Desktop and the Start Menu.
6. Recognize and Deal with the different Desktop icons of the different Applications.
7. Control the properties of the Desktop.
8. Recognize the Taskbar and control its main features.
9. Manage and Find Files and Folders using File Explorer.
10. Find Applications, Programs, Audio Files, Photos, Documents, Videos on the internet.
11. Search through the Windows Assistant "Cortana".
12. Use the Control Panel in Windows 10.
13. Install or Remove Applications and Programs.



Windows 10

### 8- 1 What is the Operating System:

The Operating System (OS) is a set of computer programs that are responsible for running the computer and managing its various hardware and software components. The Operating System must be installed on the machine to be able to use it as the OS represents the connection between the user and the computer.

### 8- 2 The Main Tasks of the Operating System:

**Skill 8 - 1**  
Recognize the tasks of the OS



*The operating system has various tasks and functions, among these functions:*

- Starting the computer.
- Controlling all the hardware components from input, output, and storing units, etc.
- Transferring data among the different components of the computer and saving them on the storing units.
- Providing a user interface.
- Distributing the different roles on the computer users.
- Detecting and fixing the different system errors or faults.
- Securing the system and maintaining the security.
- Managing the tasks and giving priority to implementing tasks.
- Loading the running applications and programs to the RAM.

### 8 -3 Types of Operating Systems:

**Skill 8 - 2**  
Recognize the different types of OS



*There are different types of operating systems:*

- **Single-Task OS:** these operating systems allow the user to run one program at a time. An example of these operating systems is the Disk Operating System (DOS).
- **Multi-Tasking OS:** these operating systems allow the user to run more than one program at a time. An example of these operating systems is Windows 10.

- **Multiprocessing OS:** these operating systems are used for computers containing more than one processor and are characterized by their ability to distribute the tasks and processes on more than one processor to increase the efficiency of the computer to increase the processing speed. An example of these operating systems is the SUN-OS.
- **Time Sharing OS:** these operating systems are used for systems having more than one user each of which is connected to peripheral units (input and output) on the same computer. Each user is given a time interval to run his commands. An example of these operating systems is the Unix.
- **Real-Time OS:** these operating systems are used in systems requiring input and output at the same time for example in medical appliances, scientific laboratories, spacecrafts. An example of these operating systems is the RT Linux.
- **Networks OS:** these operating systems contain components that allow the computer to connect and serve another computer inside a particular network. An example of these operating systems is Windows Server 2008.

### 8 -4 Introduction to Windows 10:

Microsoft is considered as one of the leading software companies thanks to its production to various important software programs. Among its famous software programs and systems is Windows 10. Windows 10 is considered as the latest version of its operating systems. It appeared since September 30, 2014 and its first edition was released in July 29, 2015. Windows 10 appeared immediately after Windows 8.1 and Windows 9 was not released as expected. This is because the company wanted to refer to the great advancement, updates, and various advantages that Windows 10 has over Windows 8.1.

#### 8 -4 -1 New Features of Windows 10

### Skill 8 - 3 Knowing New Features of Windows 10



1. **One OS for all machines:** the most important advantage of Windows 10 is that it runs suitably on all personal computers, laptops, smartphones, and tablets.
2. **Reappearance of the Start Menu:** one of the most annoying features of Windows 8.1 is the disappearance of the Start Menu. In Windows 10, the Start Menu reappeared but it has been merged with the Metro interface to provide an attractive appearance.

3. **Multiples Desktops Property:** now in Windows 10, you can create more than one Desktop and move among these Desktops easily.
4. **Desktop Applications:** Apps are small programs from the world, smartphones, and tablets such as weather, calculator, ...etc. In Windows 10, you can run the apps separately as in Windows 8.1 or through the Desktop which is the new feature in Windows 10. In addition, the number of apps has increased to more than 2,000,000 apps existing on Microsoft Store of Windows 10.
5. **The WindowsAssistant “Cortana”:** In Windows 10, Microsoft provided a digital assistant and named it “Cortana”. Cortana is a program that allows the user to reach the information, and files through audio and written commands.
6. **The Loading Speed:** Loading Windows 10 and start running it takes only 20 seconds approximately.
7. **Microsoft Store:** Microsoft Store that comes in Windows 10 contains many applications such as social media applications, e.g. facebook, which allows you to login to these applications without the need to browsing them on the internet.
8. **Running Applications:** Windows 10 runs most of the applications that run on Windows Vista, Windows 7, Windows 8, and Windows 8.1.
9. **Protection and Security:** In Windows 10, you can sign into your computer through various methods such as password, facial recognition, fingerprint, eyeprint when the hardware required is available on your machine.

#### **8- 4- 2 Window 10 System Requirements**

### **Skill 8 - 4** **System requirements to upgrade to Windows 10**



You can upgrade to Windows 10 if the operating system on your machine is a legal copy of Windows 7 or Windows 8.1. Also, there are other software and hardware requirements to be able to run Windows 10:

1. At least 1 GHz processor.
2. At least 1 GB RAM to run Windows 10 32 bit and 2 GB RAM to run Windows 10 64 bit.
3. A free storage space not less than 16 GB for 32 bit and 20 GB for 64 bit.
4. DirectX 9 or the latest version of WDDM 1.0.

**8-4-3 Editions of Windows 10:****Skill 8-5**

Knowing the different editions of Windows 10 and the features of each



Microsoft has released different editions of Windows 10 (32 bits and 64 bits). Each edition contains certain features to cover the need of particular users and these editions are:

1. Home Edition: this edition targets the ordinary users. It contains the Start Menu and its applications. We need a desktop with complete specifications to run the classic Windows programs.
2. PRO Edition: this edition targets small corporations. It contains all the features of the Home Edition in addition to some extra features for networks and encrypting data.
3. Mobile Edition: this edition has been designed for smart phones and tablets and provide different advantages among which maintaining the battery for longer periods.
4. Enterprise-Enterprise/Mobile Edition: this edition was designed for large corporations that has many branches in different cities and that uses computers of different types and specifications from desktops, laptops, and smart phones.
5. Education Edition: Microsoft allocated this edition for educational institutions such as school, institutes and universities.
6. Internet of Things (IOT) Edition: this copy of Windows 10 is more specialized where it is used to run things through the internet such as controlling and running ATMs and controlling home appliances through the internet.

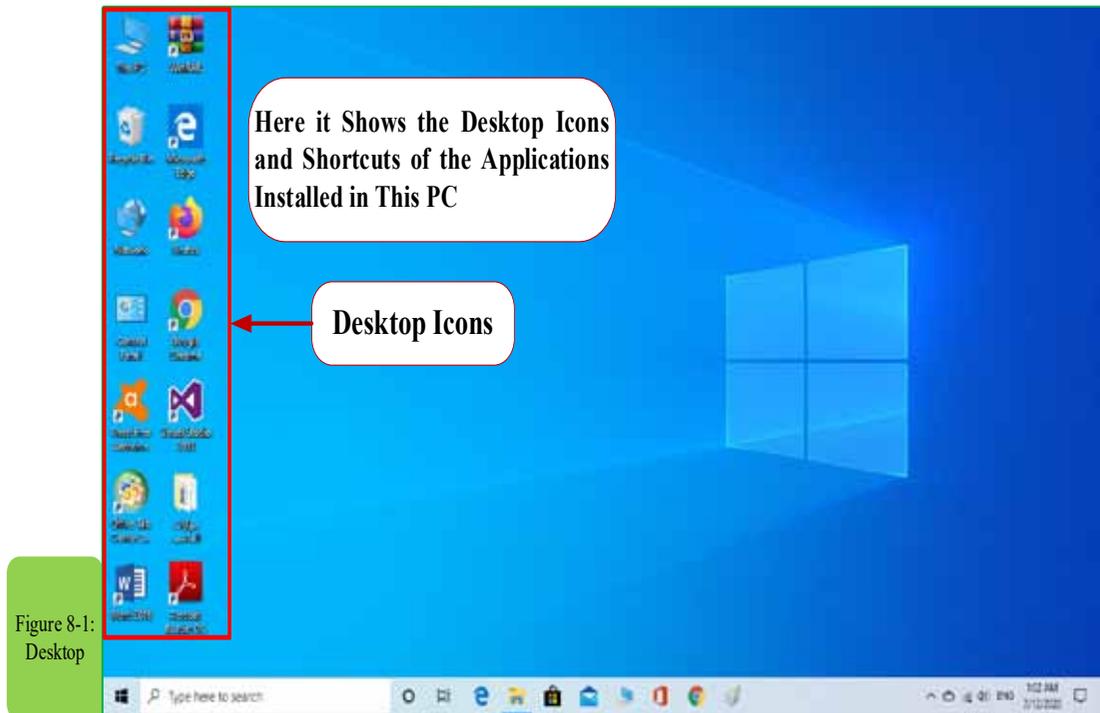
**8-5 Desktop:****Skill 8 - 6**

Recognizing Desktop



Desktop is the main screen that appears on starting Windows 10. It contains a set of icons that tell about the applications and programs installed on the computer.

You can add shortcuts for the programs and applications on the Desktop to ease reaching them see Fig. 8- 1.

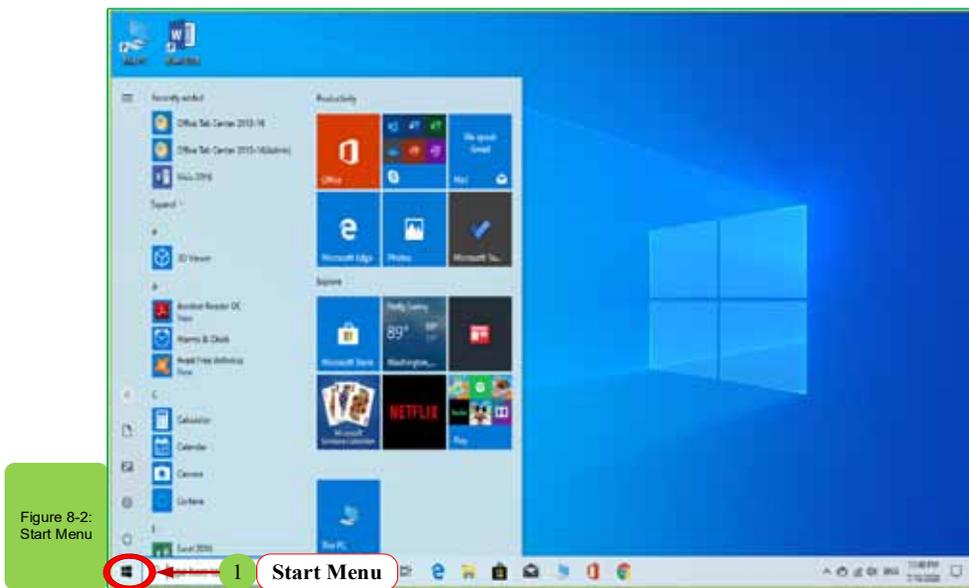


### 8- 5- 1 Start Menu:

**Skill 8 - 7**  
running programs and applications from the Start Menu



The Start Menu is the main menu that appears in the left bottom of the Desktop. It allows you to control the applications, programs, files, settings, icons, search, etc. Windows 10 has returned the Start Menu with a modern view as in Fig. 8 -2.



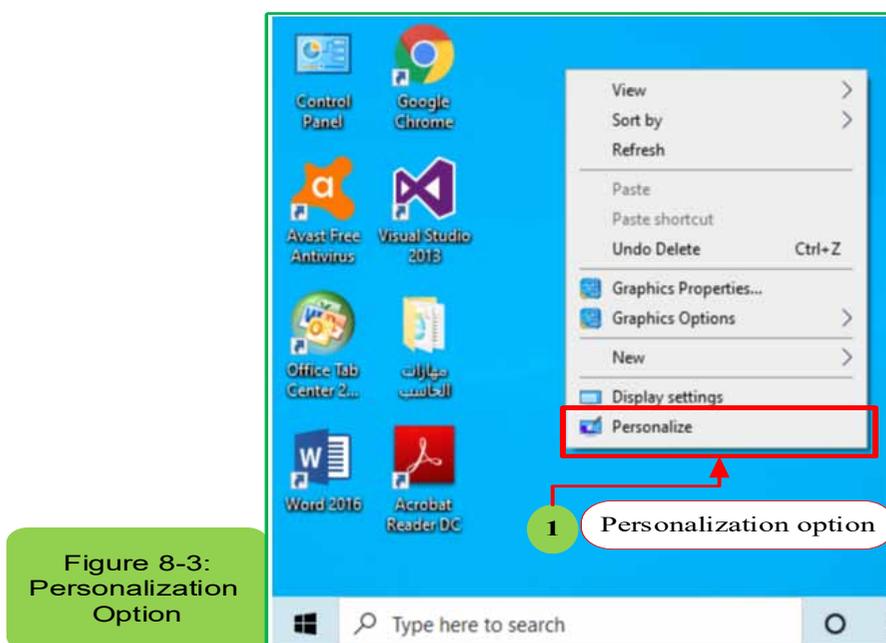
### Changing the Start Menu:

**Skill 8 - 8**  
Changing the Start Menu



#### *To change the Start Menu, follow the following steps:*

1. Right click on an empty place on the Desktop. The Desktop options menu will pop up. Select “Personalization” as in Fig. 8 -3.



2. The “Settings” window will appear. Click on “Start”. Then, make the required changes to the Start Menu as in Fig. 84-.

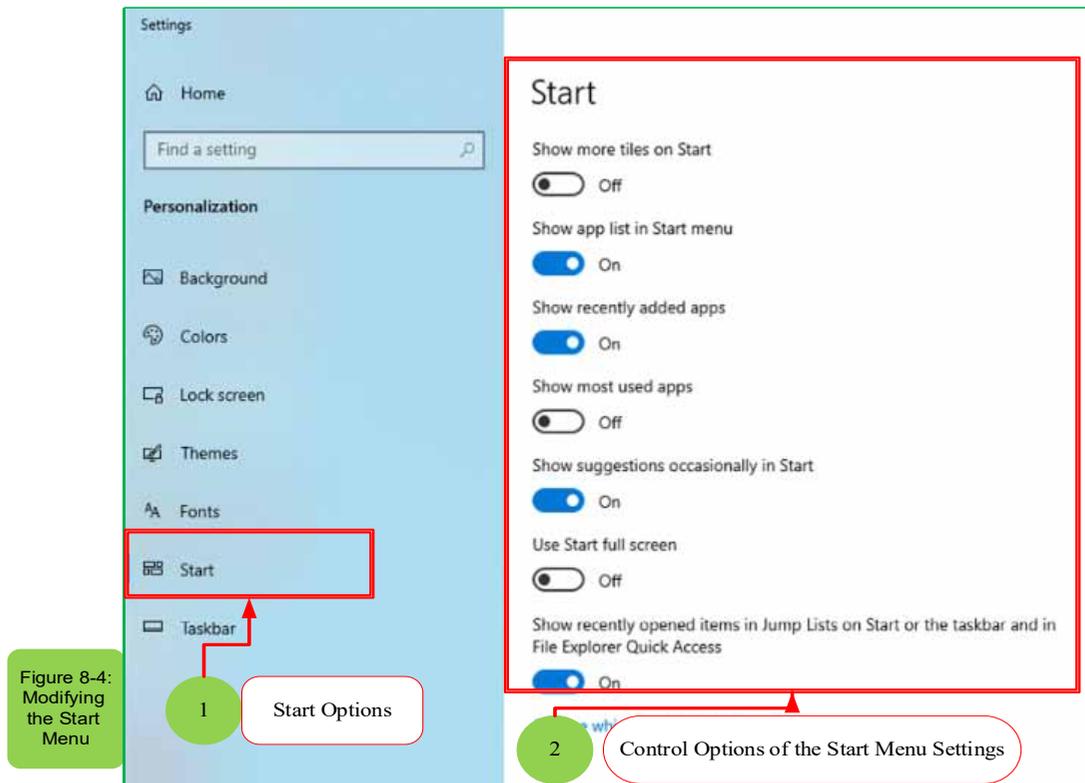


Figure 8-4:  
Modifying  
the Start  
Menu

### 82-5- Dealing with the Desktop Icons:

- **Knowing the most important Desktop icons**

**Skill 8 - 9**  
Knowing the most important Desktop icons



Icons represent a shortcut to quickly start the applications and programs installed on the computer from the Desktop. There are two types of icons:

- **Windows 10 Icons:** they are the icons of the programs and applications that come with Windows 10. Examples of these icons are “This PC”, “Control Panel”, “Recycle Bin”, the personal folder (my folders).
- **Icons of Other Applications and Programs:** they are the icons of the applications that the users need and install on the computer and appear directly on the Desktop. Examples of Desktop icons are the Recycle Bin and the Control Panel as in Fig. 8 -5.



Figure 8-5:  
Desktop Icons  
"Network"

● **Control Panel:**

Definition of the control panel: it is a folder through which the user can control all computer hardware and software and change the device settings through which it can do many tasks such as removing programs and changing the device language and these tasks will be detailed in a later part.

● **Icon of Computer:**

The icon of "This PC" is an icon that enables the user to view all the storage units on the computer such as hard disks and floppy and compact disks. Fig. 8 -6 shows the window of "This PC".

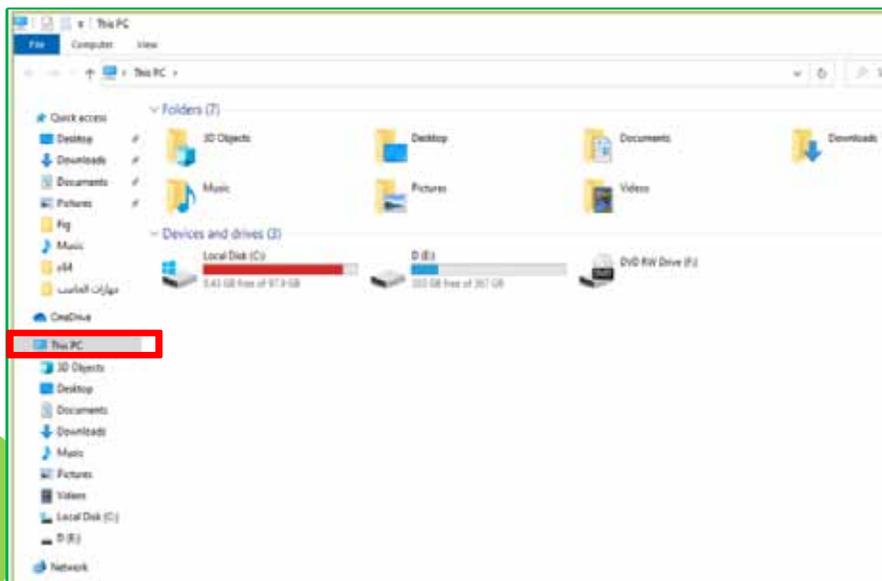


Figure 8-6:  
Window of  
"This PC"

● **Recycle Bin:**

**Skill 8 - 10**

Restoring deleted files and folders from the Recycle Bin

The Recycle Bin is the place where the deleted files and folders are sent. From the Recycle Bin, it is possible to restore the deleted files and folders if needed. Fig. 87- shows the contents of the Recycle Bin.

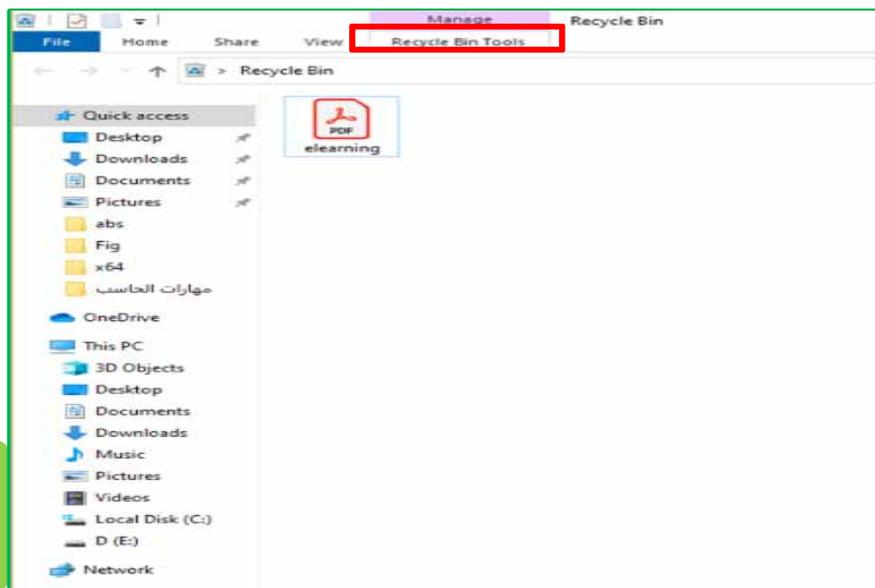


Figure 8-7:  
Contents of the  
Recycle Bin

To restore a file or a folder from the Recycle Bin, right click on the file or the folder as shown in Fig. (8- 8), then select “Restore”.

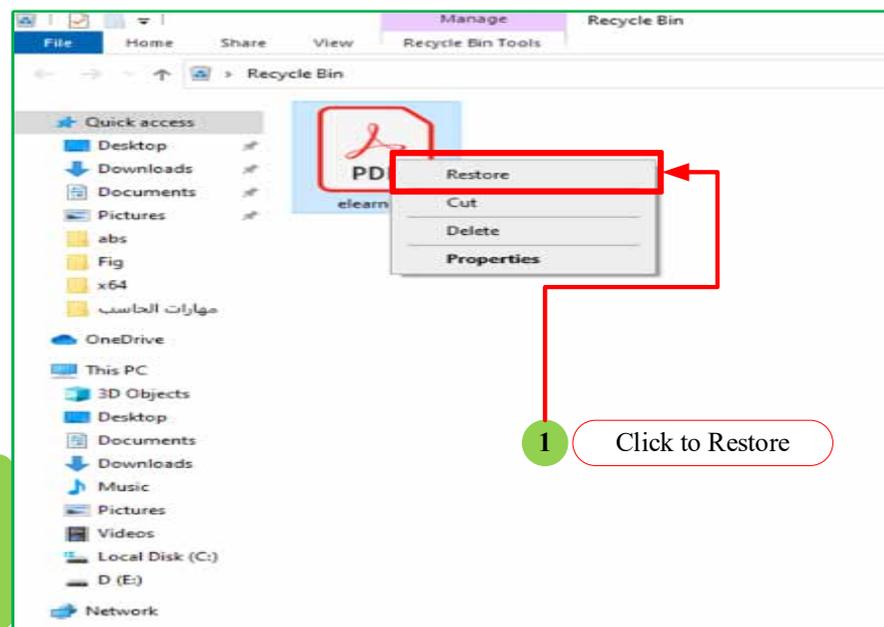


Figure 8-8:  
Restoring File  
or Folder  
Form the  
Recycle Bin

To permanently remove a file from the computer, go to the Recycle Bin, right click on the file and then select “Delete”. You can delete a file or a folder from anywhere in the PC permanently without sending it to the Recycle Bin by selecting

the file or the folder and pressing “**SHIFT + DELETE**”. **Showing/Hiding the Desktop Icons:**

### Skill 8 - 11 Showing or Hiding Desktop Icons



*The Desktop icons might be hidden. To display them, follow the following steps:*

1- Right Click on an empty place on the Desktop. A window will appear as shown in Fig. 89-. Select “**Personalize**”.

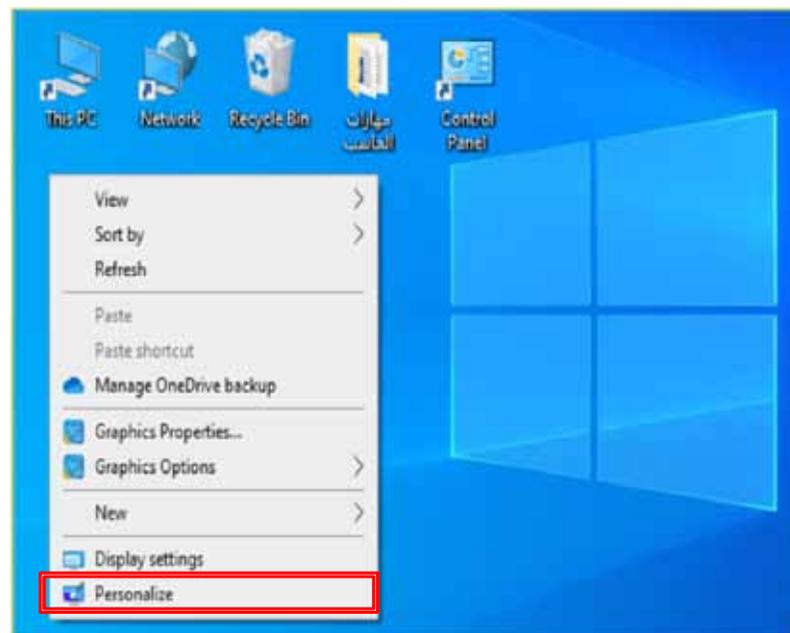
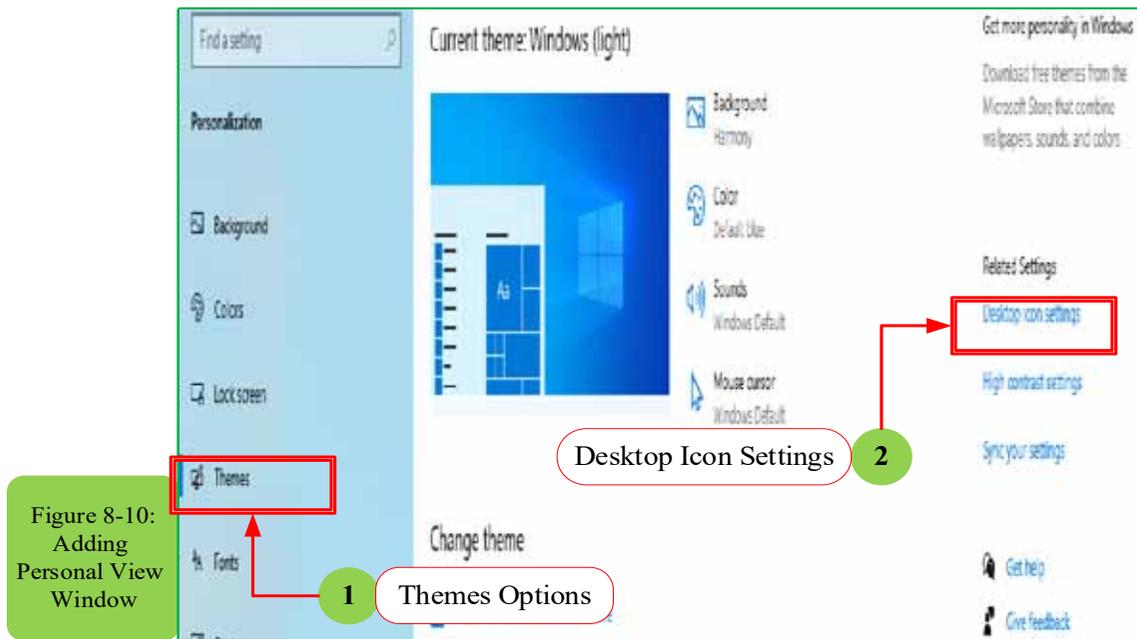
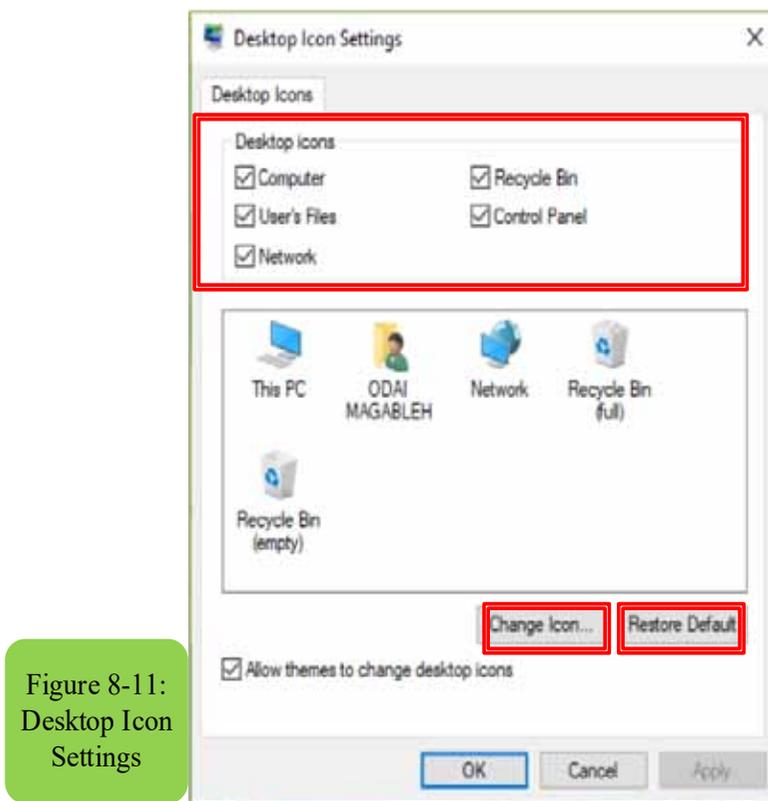


Figure 8-9:  
Personalization  
Window

2. **Settings>Personalization** window will appear. Select “**Themes**”. Select “**Desktop icon settings**” as shown in Fig. (8- 10).



3. Select the icons you want to display on the Desktop as shown in Fig. 811-.



4. Click "OK". Also, you can change the icons from the previous window.

**8-5-3 Changing the Desktop:**

*For Desktop Personalization, follow the following steps:*

1. Right click on an empty location on the Desktop. The options window will appear. Select **“Personalize”**.
2. The **“Settings> Personalization”** Window will appear. From this window, you can personalize the Desktop. For Example, you can change the Background, the Colors, the Start, the Taskbar, the Lock Screen, the Themes, etc. Changing the Desktop Background:

### Skill 8 - 12

## Changing the Desktop Background



**To Change the Desktop Background, follow the following steps:**

1. Right Click on an empty location on the Desktop, the options of Desktop will appear. Select **“Personalize”**.
2. the **“Settings”** window will appear. Click on **“Background”**.
3. Select the suitable Background. A window will preview the Background as shown in Fig. 8- 12.

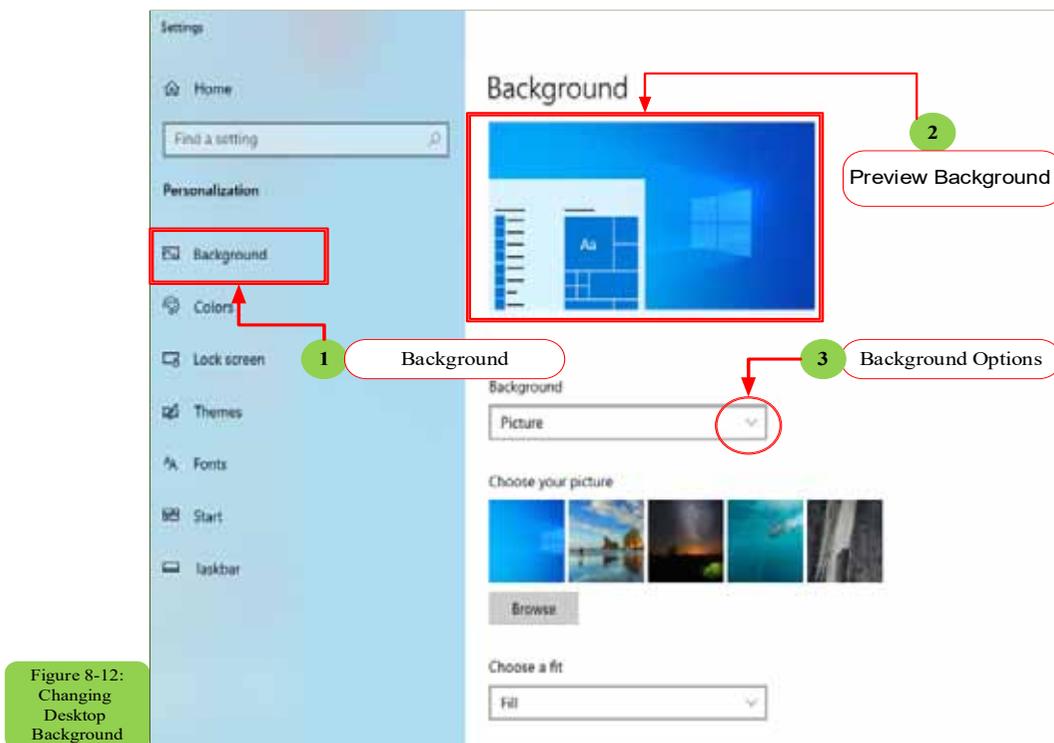
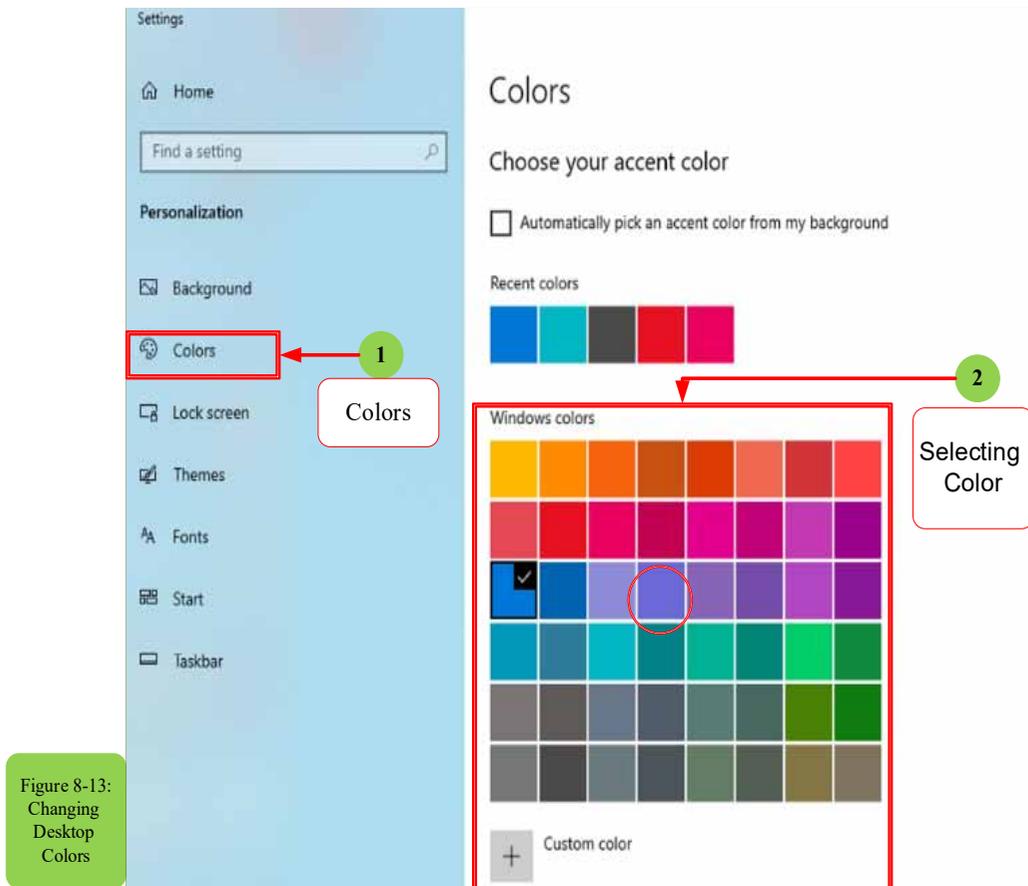


Figure 8-12:  
Changing  
Desktop  
Background

- **Changing the Colors:**

*To change the colors of the menus, follow the following steps:*

1. Right Click on an empty location on the Desktop. Options menu will appear. Select “**Personalize**”.
2. The “**Settings > Personalization**” window will appear. Click on “**Colors**” tab, then select the desired color as shown in Fig. 8- 13.



- **Changing the Lock Screen:**



*To change the Lock Screen, follow the following steps:*

1. Right click on an empty location on the Desktop. The options menu will appear. Select “**Personalize**”.
2. The “**Settings**” window will appear. Click on the “**Lock Screen**” tab. Then selected the desired Lock Screen.

3. Select the suitable Background for the Lock Screen. The preview will appear on the upper window as shown in Fig. 814-.
4. Click “ON” to apply the desired Lock Screen.

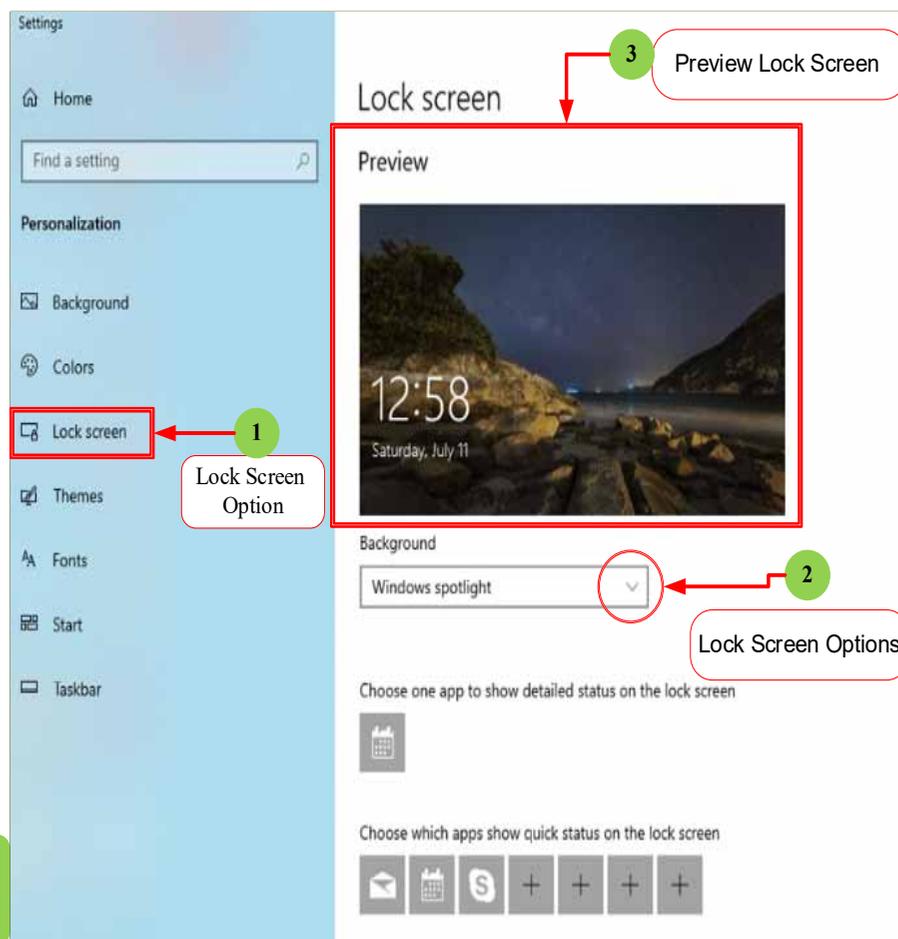


Figure 8-14:  
Changing the  
Lock Screen

1

• **Display Settings:**

**Skill 8 - 14**  
Adjusting Display Settings



The option of the display settings enables you to adjust the screen resolution and make it easier to read what appears on the screen. To adjust the display settings, follow these steps:

1. Click on an empty place on the desktop with the right mouse button to display the Desktop Options window and choose “Display Settings” as shown in Figure (8- 15).

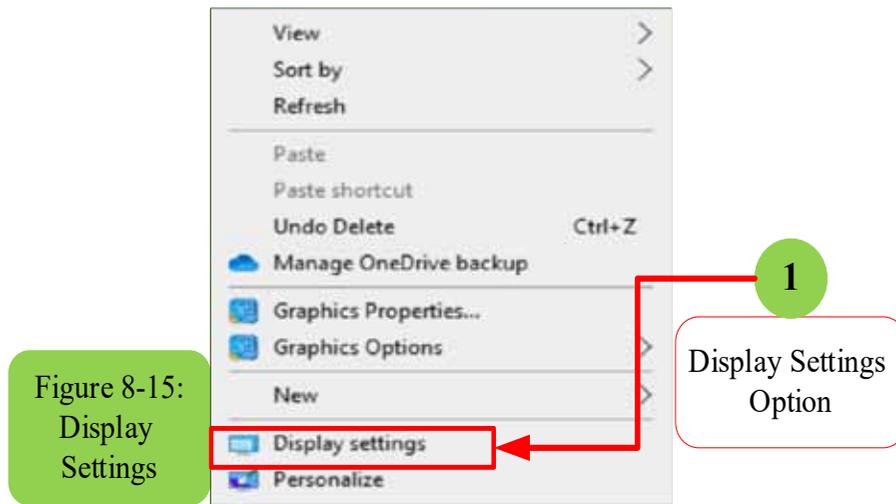


Figure 8-15:  
Display  
Settings

2. A “Settings” window will appear from it. Click on the “Display” option, and through it you can control (color, scale, resolution, orientation, layout,...). See Figure (8- 16).

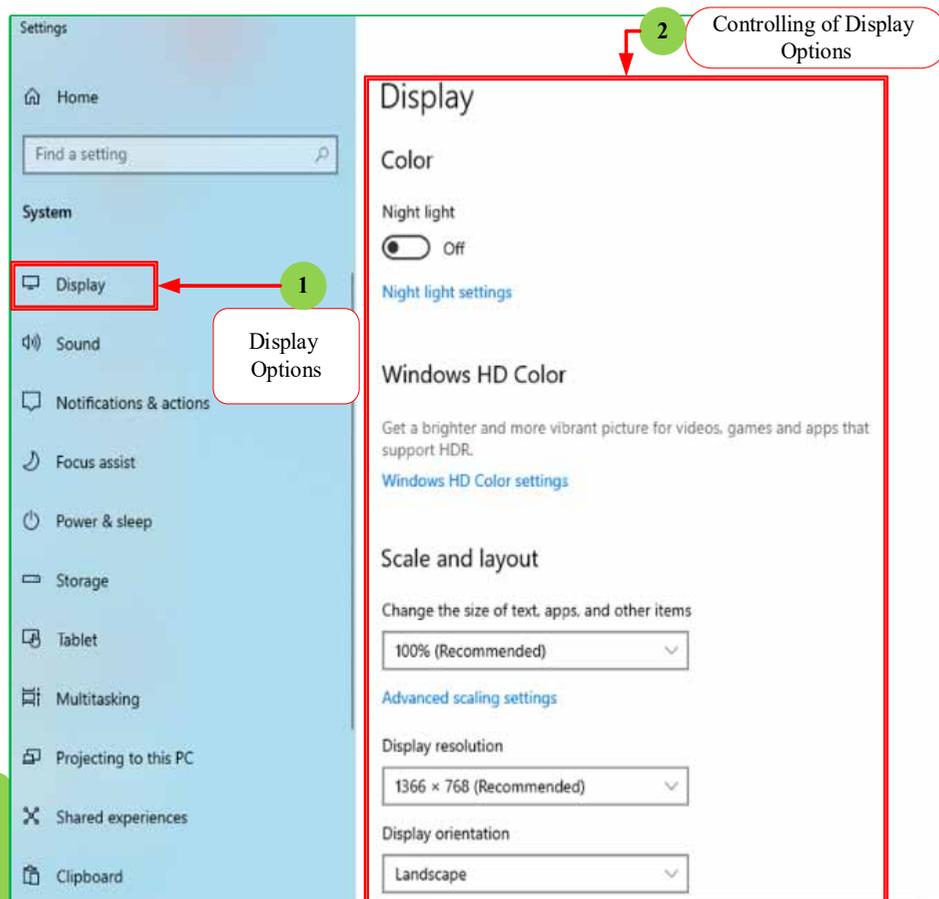
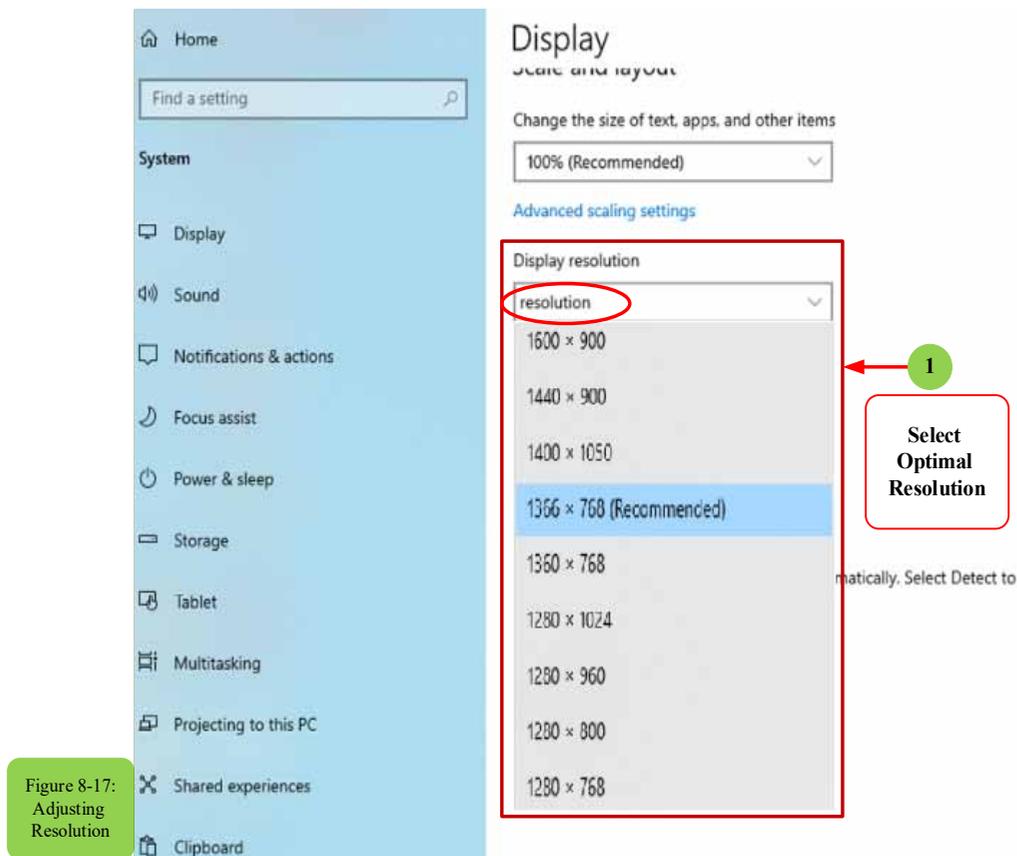


Figure 8-16:  
Adjusting  
Display  
Settings

3. For example, to change the resolution settings by increasing or decreasing the number of colorpixels per square inch, left-click on the resolution box.
4. Adjust to the resolution you want to change the appearance of the screen, see Figure (8- 17).



**8 -6 Taskbar:**

**Skill 8 - 15**  
Recognizing the settings of the Taskbar

The taskbar is the bar that runs along the bottom of the desktop screen, in which active windows appear on the desktop, and it contains several items the most important of them (language selection buttons, clock and date buttons, volume control, and the Start button).

**To show taskbar settings, follow the following steps:**

1. Right-click on the taskbar. A window will appear with several settings for the taskbar, then click on the task manager option as shown in Figure (8 -18).

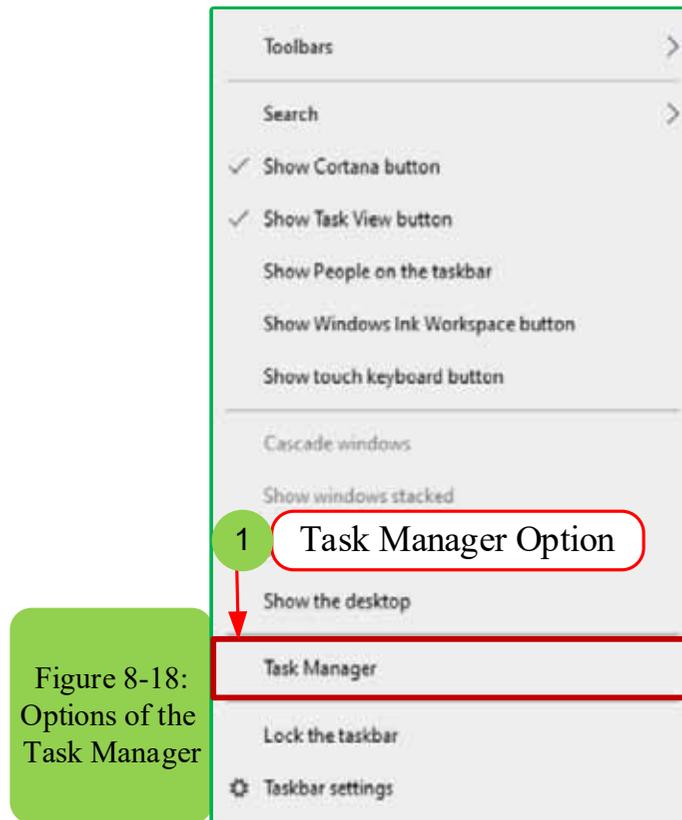


Figure 8-18:  
Options of the  
Task Manager

2. The “Task Manager” setting enables you to end any active task on the computer by selecting the task and then clicking End task.

- **Moving the Taskbar**

**Skill 8 - 16**  
**Moving The Taskbar**



***To move the taskbar, follow the next steps:***

1. Right-click on the taskbar and ensure that “lock taskbar” option is not enabled in the taskbar settings
2. Hold down the primary mouse button, and then drag the mouse pointer to the place on the screen where you want the taskbar.
3. The taskbar will take its place in that area of the desktop screen, see Figure 8- 19.

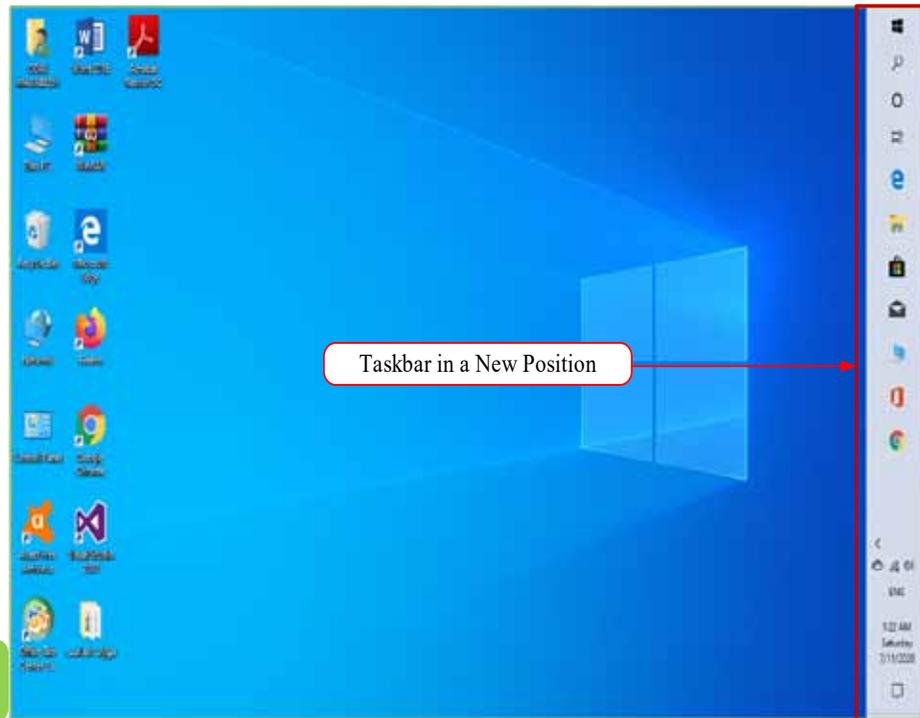


Figure 8-19:  
Moving Taskbar

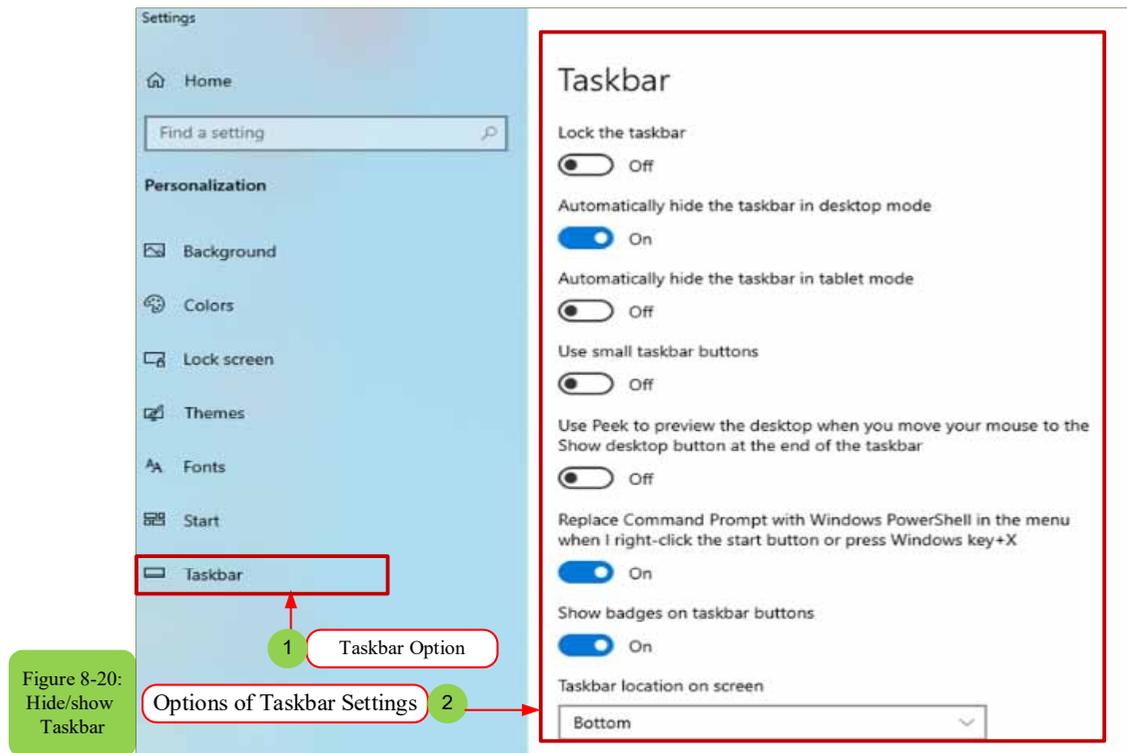
● **Changing the Taskbar Settings**

**Skill 8 - 17**  
Changing the Taskbar Settings



**To change the taskbar, follow these steps:**

1. Right-click in an empty place on the desktop and choose “Personalize.”
2. A “Settings” window will appear from it, click on the “Taskbar” settings.
3. Make the appropriate change you want to the taskbar settings, see Figure 8- 20.



After learning about the taskbar settings, some of these settings can now be changed, for example temporarily hiding the taskbar from the desktop screen as in the following steps

- **Hiding the Taskbar from the Desktop:**

**Skill 8 - 18**  
**Hiding The Taskbar**



*To hide the taskbar, follow these steps:*

1. Right-click in an empty place on the desktop and select “Personalize”.
2. A “Settings” window will appear from it, click on the “Taskbar” settings.
3. Turn on the option “Automatically hide the taskbar in desktop mode” see Figure (8- 21).
4. The taskbar will disappear from the screen and you can restore it by moving the mouse over the bottom of the screen.

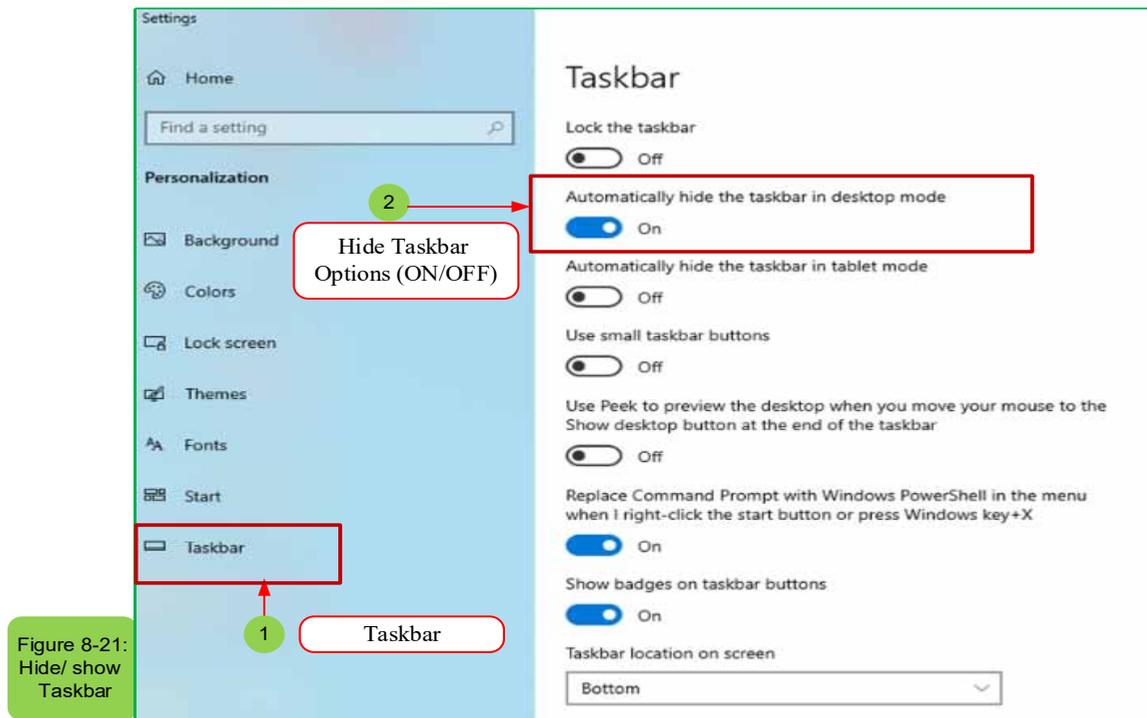


Figure 8-21:  
Hide/ show  
Taskbar

## 8- 7 Working with folders and files

*In this section we will explain:*

How to use the file explorer program known as Windows Explorer?

- How to save files outside the computer, for example on the Internet via OneDrive.
- How to recover and save files and learn how to create, save, change and rename the folder.

Currently we do not have to deal with the system on the default settings for Windows, so one of the changes that the system user may want is to manage folders, for example when clicking on the (File Explorer) icon in the taskbar, the Quick Access folder opens but some users prefer to enter (This PC) window instead of the Quick Access.

- How to add folders or files to the Quick Access folder in order to facilitate access to them, especially if these files are the most used and their access require opening a lot of other folders.

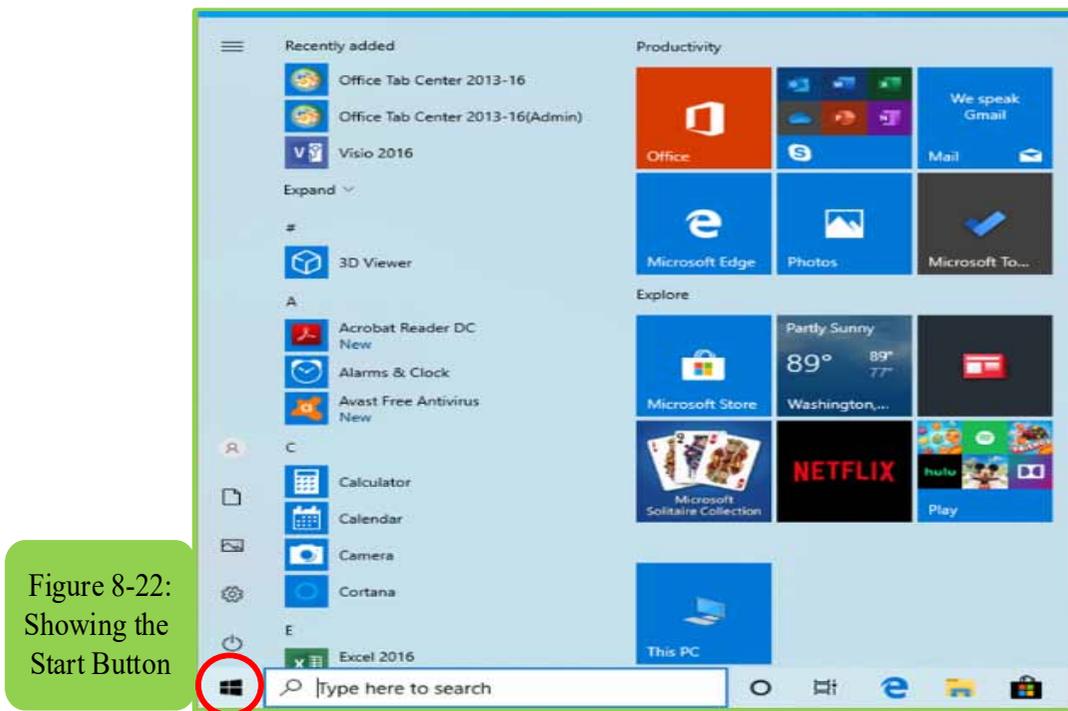
**8- 7 -1 How to Browse Files:**

**Skill 8 - 19**  
Using start and File Explorer Buttons



The file is a collection of data that is stored inside the storage media (hard disk, CD, or flash memory) and has different extensions (such as Excel, Microsoft word, etc.) and the user can deal with it either by restoring, modifying, deleting, sharing, or Print them out.

Through File Explorer, you can manage the storage areas on the computer, allowing you to copy, move, rename or delete files. To open File Explorer, click the Start button as shown in Figure 822-



Then we choose from the Start menu file explorer button, or by pressing the Windows  +E buttons as in Figure 823-



8- 7- 2 Dealing with quick access window and internal media

**Skill 8- 20**  
Learning the dealing with Quick Access window and Internal Media



When you press the button in Figure 823-, the Quick Access window appears to us through which all the file explorer windows can be displayed and browses all the files and folders that have been worked with recently or frequently as in Figure 8- 24.



Figure 8-24: Quick Access Window

When you click on “This PC” icon located inside File Explorer, it shows all the secondary storage media through which you can find the file that we want to work on as in Figure 825-.

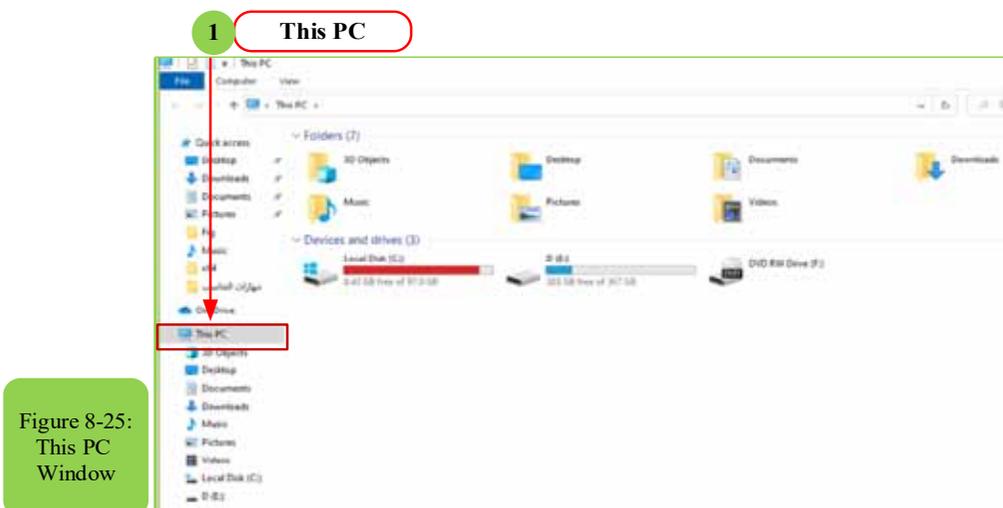


Figure 8-25: This PC Window

We also find that the information displayed in the window of this PC helps you to access the files or folders you want.

**8-7 -3 File Types:**

**Skill 8- 21**  
Learning about the most important Types of files



There are many types of files that can be created within the Windows 10 operating system. Each type has its own formatting that defines from the file extension and on creating any file the type is chosen at the beginning, thus the operating system places the extension automatically, and the file extension determines its type, and it usually consists of three or four Characters in English, separating the filename with a dot (.)

Example: on creating a microsoftword file, the two sections appear to us as in Figure 8- 26. The operating system asks to type the name of the file the user desires. When writing the file name, the following should be considered:

- Filename must not exceed 219 characters.
- Filenamedoes not contain special signs like +, /, \*, ... etc.
- Filename name can contain numbers

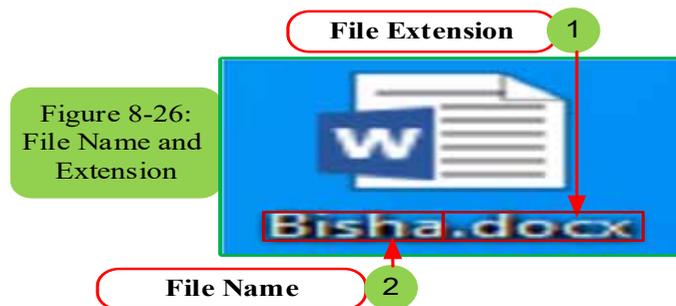


Table 8- 1 shows examples of the most common file extensions.

Table 8- 1 Examples of the most common extensions		
1	Word Files	DOCX , DOC, TXT
2	Power Point Files	PPTX, PPT
3	Excel files	XLSX, XLS
4	Access Database Files	ACCDB, MDB
5	Audio Files	WAV , MP3
6	Video Files	AVI , MOV , DAT
7	Photos	BMP , JPG, GIF, PNG, TIFF
8	Executables files	EXE, COM
9	Adobe Acrobat file	PDF

8 -7- 4 Creating Files

**Skill 8- 22**  
Recognizing the Creating and Renaming of Files



*There are several methods to create files, for example:*

1. The traditional method: files can be created directly from their own programs by entering the Start menu and choosing the specific program.
2. The Fast Way: There is a fast way to create a file in some programs, including setting a shortcut to create its files in a fast way on the desktop, as follows:
  - We click the right mouse button on the desktop or in any folder in an empty place, as in Figure 827-
  - We choose from the sub-menu that appears (New).
  - Another submenu appears from which we select the desired file that we want to use, for example (MS Word).

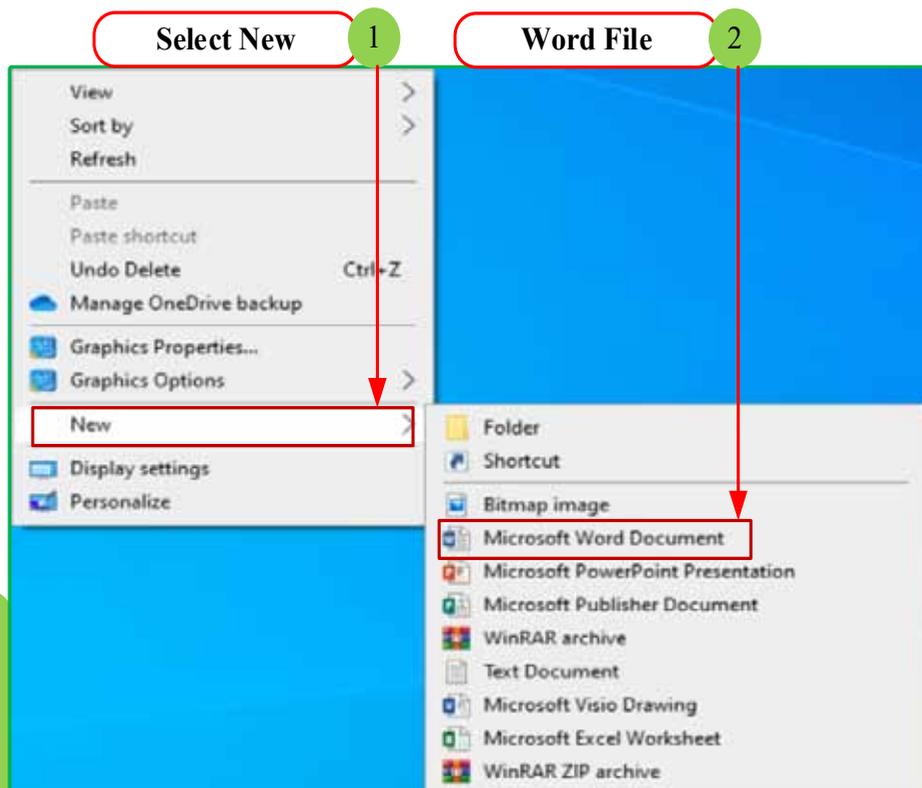


Figure 8-27:  
Creating a  
New File by  
Using the  
Mouse Right  
Click

- The required file will be created and given a default name that can then be modified.

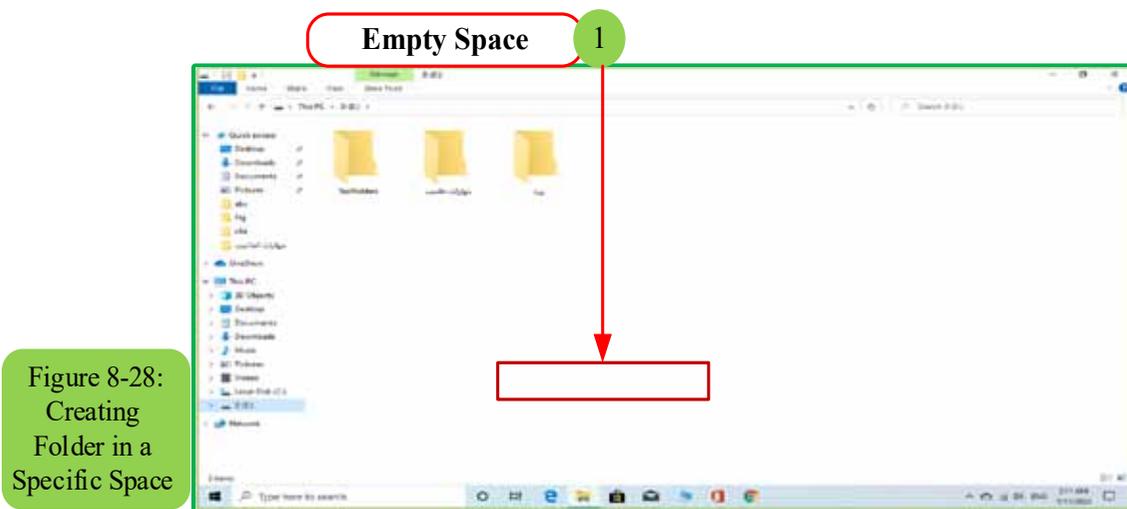
**8-7-5 How to create a Folder**

**Skill 8 - 23**  
How to create a folder on the Desktop

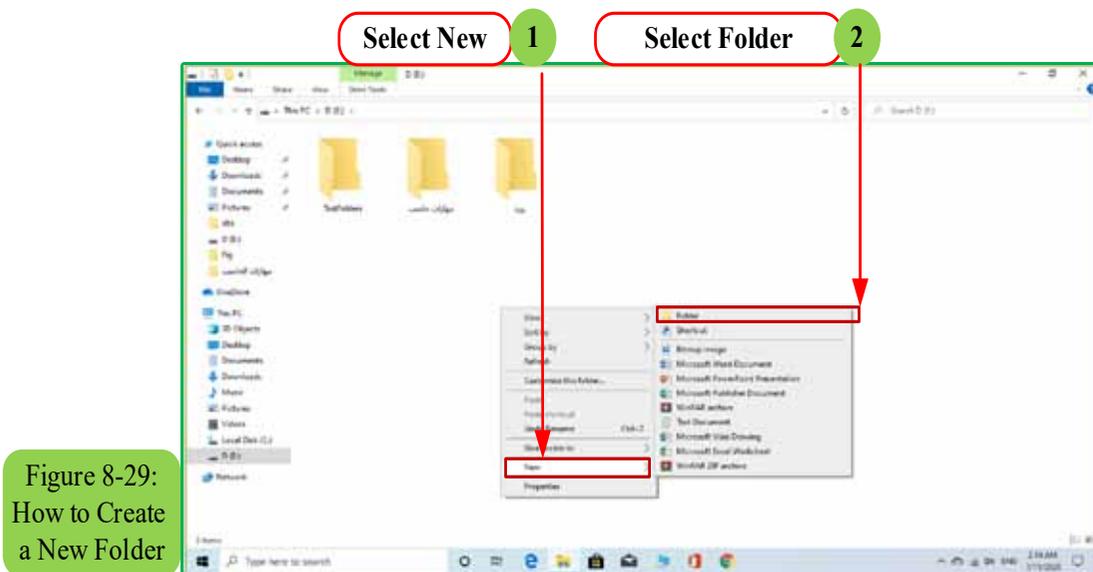


To store new data inside a folder, you can create a new folder by following these steps:

1. Open the place where you want to create the folder using the Windows file browser, as in Figure 828-.



2. Right-click on an empty space as shown in Figure 829-.
3. Choose “New” from the pop-up menu. A sub-menu will appear for you. Choose “Folder” from the top of the list, as shown in Figure 829-.



- The folder will be created, and the operating system will assign its name by default, as in Figure 830-.

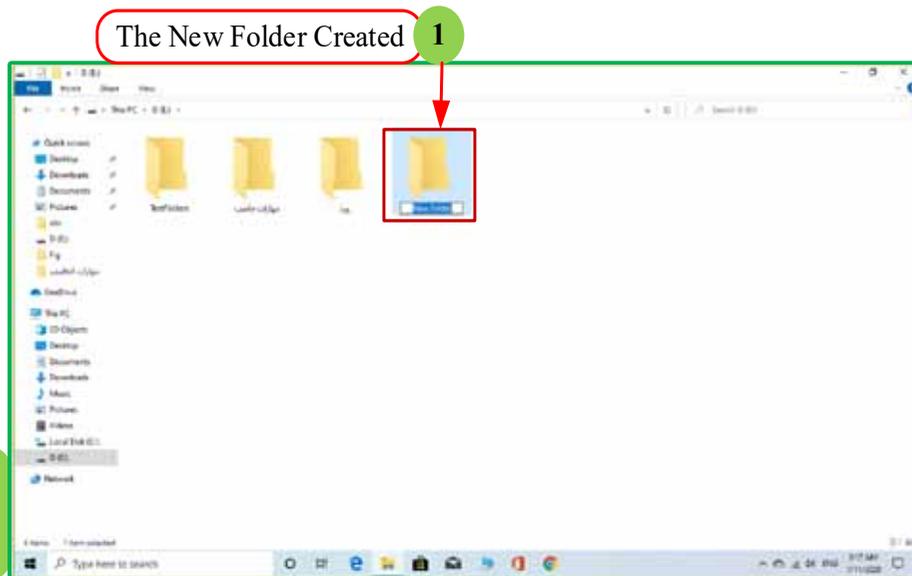


Figure 8-30:  
Showing the  
Created Folder

### 8 -7- 6 Editing a File or a Folder Name

**Skill 8 - 24**  
Editing a file or Folder Name

**There are several methods to edit a file or folder name:**

**The first method:** we select the folder or file whose name is required to be modified, then we single-click on the name of the folder or file and we write the new name and then press Enter or click the left mouse button outside the name text box.

**The second method:** we select the folder or file whose name is to be modified, then from the keyboard we press the F2 button and write the new file name and then press Enter

**The third method:** right-click on the folder or file whose name is requested to be modified as in Figure 831-. From the sub-menu that appears we choose (Rename), type the new file name and press Enter.

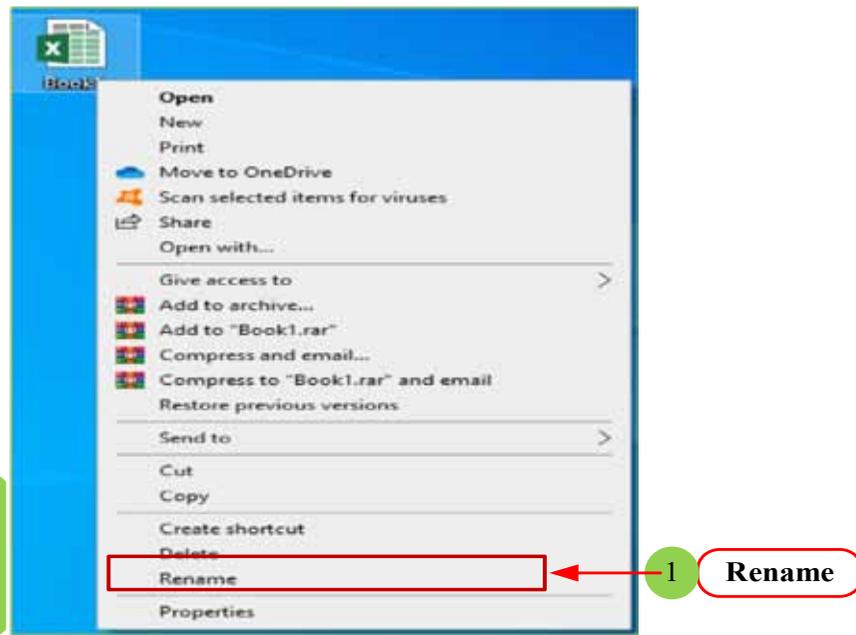


Figure 8-31:  
Editing/Renaming  
a File or a Folder

### 8-7 -7 Deleting a File or a Folder

**Skill 8 - 25**  
Deleting a file or a folder



*A file or folder can be deleted in several methods:*

**The first method:** we right-click on the file or folder required to be deleted. Then we choose from the sub-menu that shows a delete command as in Figure 8 -32.



Figure 8-32:  
Deleting a  
Folder or a File

A confirmation message to delete the file or folder appears as in Figure 833-If we want to delete the file, we press the Yes button, and if you withdraw the idea of deleting, press the No button.

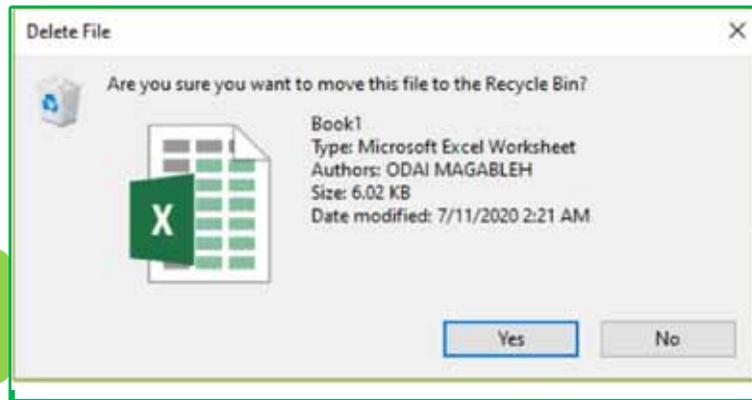


Figure 8-33:  
A Confirmation  
Message to  
Delete File

**The second method:** we select the file or folder to be deleted, then press the Delete button on the keyboard

**The third method:** We drag the file or folder to be deleted to the Recycle Bin. In this way, a warning message does not appear. The deletion is done directly

### **8 -7 -8 Saving Files in the OneDrive by default in Windows 10**

#### **Skill 8 - 26** Saving Files in the OneDrive



Many of us want to keep their files in a place that guarantees their safety, so we find that in Windows 10 it included setting a default location called “OneDrive” to store the files as in Figure 834-. We find that the default setting is to save files to OneDrive, instead of saving them to the computer. This means that you will be able to access these files from any other device by connecting to the Internet. These files will also be protected in the event of damage to your computer. You can also change the “default save” setting at any time later.

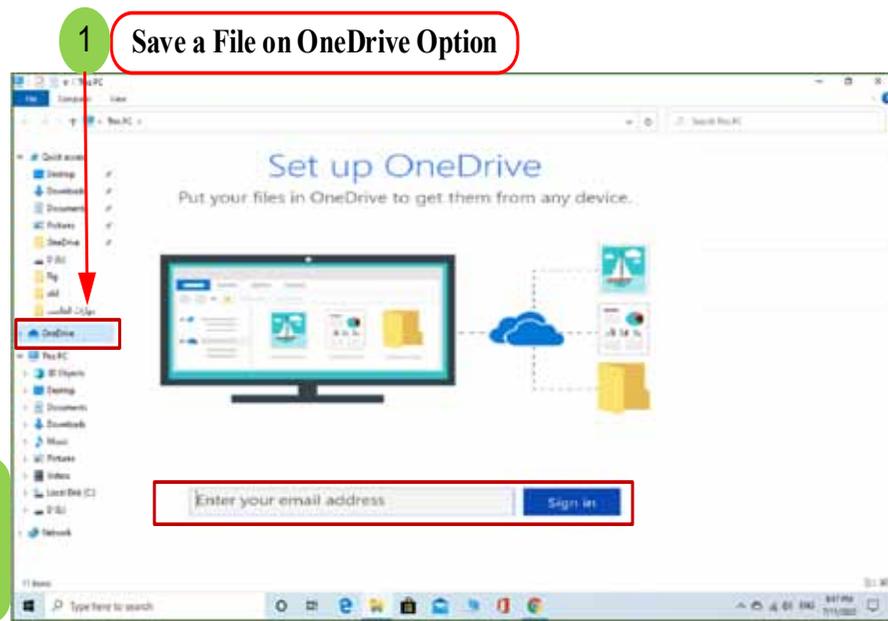


Figure 8-34:  
Saving Files to  
OneDrive

### 8-7-9 Selecting the location to save your files

By default, we can change the location where files are saved as following:

1. At the bottom of the Windows10 screen, as in Figure 835-, we right-click the OneDrive icon and click Settings.

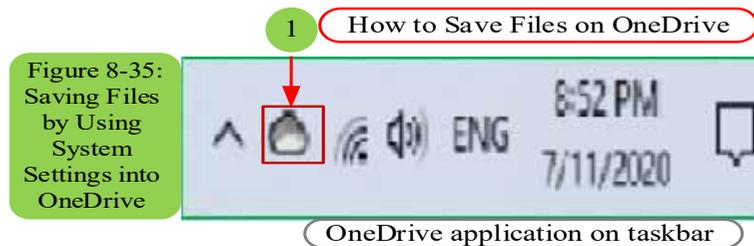


Figure 8-35:  
Saving Files  
by Using  
System  
Settings into  
OneDrive

2. In the Settings box, on the AutoSave tab, under Documents and Pictures, click the list in Documents or Pictures and choose the default save location you want.

## 8-8 Search for files and folders in Windows 10

### 8-8-1 Searching through the search box in Windows

The Windows search box function, located next to the Start button, is to help you find files on your device, hidden settings, or even hidden items or websites.

*To find the missing items, follow these steps:*

**Skill 8 - 27**  
Using the Search Box next to the Start Button

**1. Type what you want to search for into the search box next to the “Start” button**

When you start typing, Windows immediately starts looking for items match what you’re writing. For example, here is what happens when you search for files of the Computer Skills Course on your computer: When you start writing the words, Windows begins to display files or links matching the words that are written, as shown in Figure 8- 36 after writing only the word “skills”, you will see several files on your computer about the Computer Skills course (of course these files have been stored on your computer before).

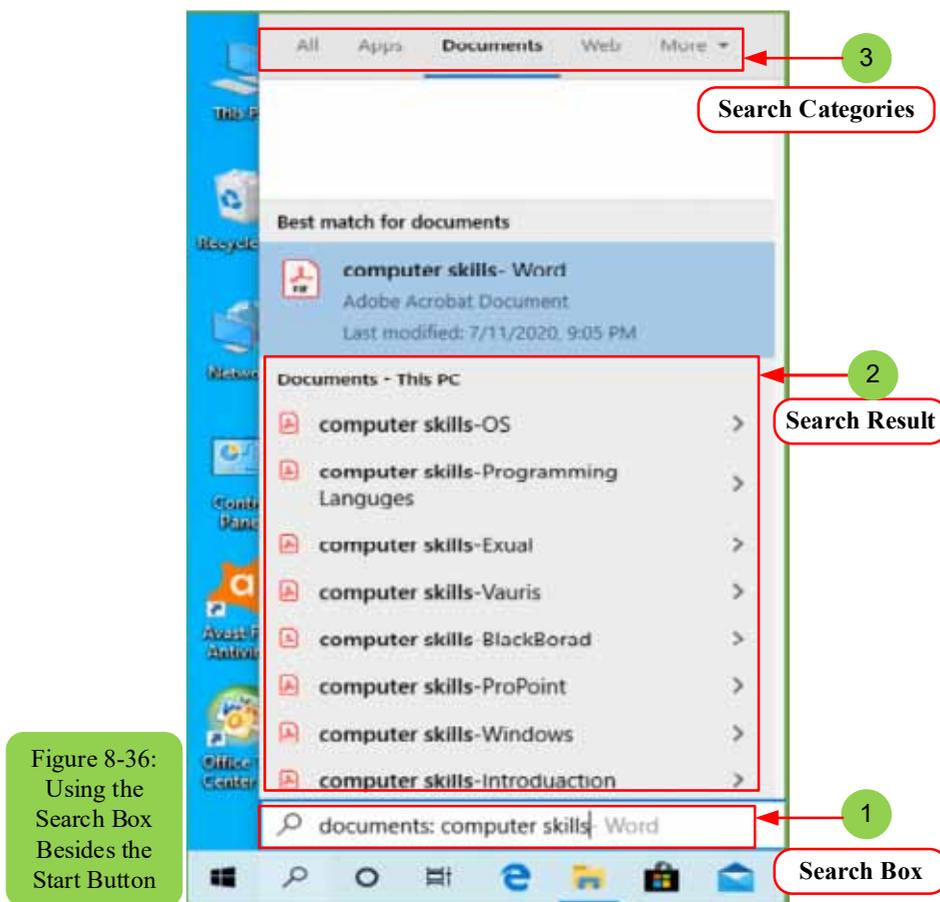


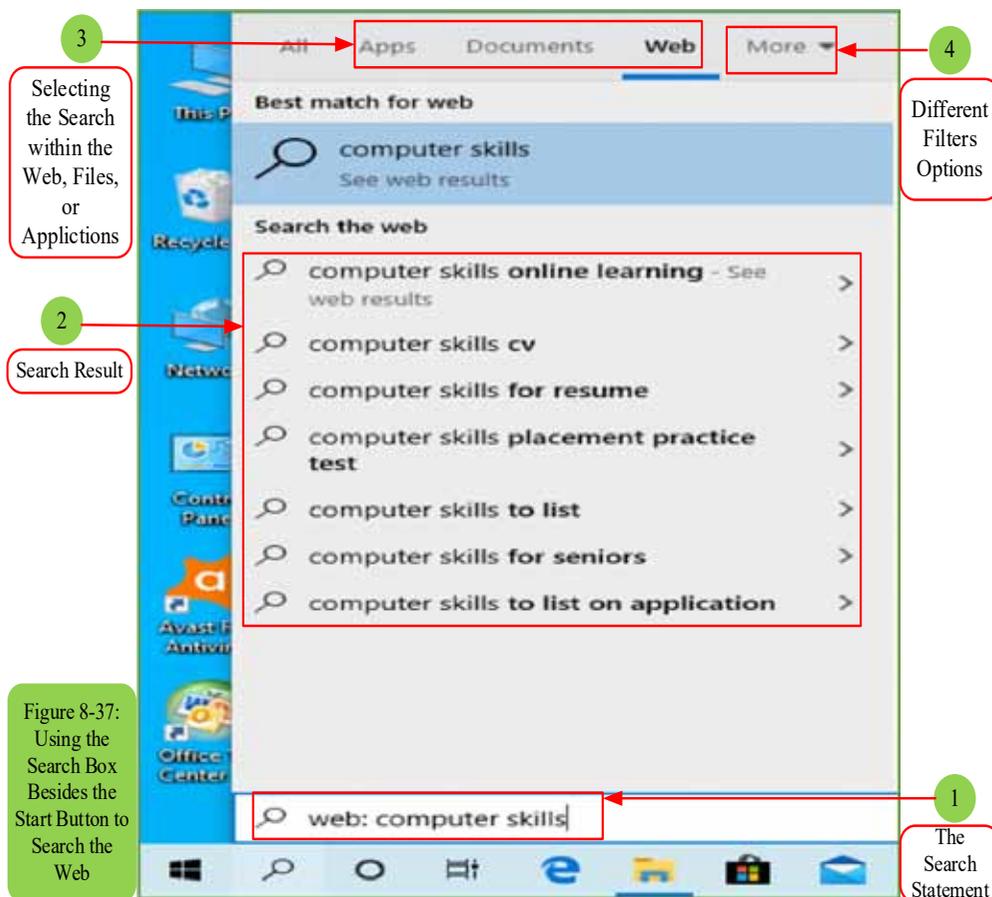
Figure 8-36:  
Using the  
Search Box  
Besides the  
Start Button

At this point, the search box focuses on the speed, so it only searches for matching file names stored on your computer. If you find what you are looking for has appeared in the search box, you can go directly to step 3. If you still did not find what you are searching for and have completed your full search statment, you must follow the next step to refine your search in a more concise form.

**2. Determine the search on the computer or the internet**

On startup, the search box only searches for matching file names. If it does not find matching names, it directs the search to one of two categories at the top of the search list (along with filters):

- **My Documents:** Choose this category to restrict the search to items only on your computer. A window appears, as shown in Figure 838- with the results listed in a scrollable list. If you also see many items, you can narrow your search by clicking on the word Filter above the list, and choose one of the categories from the drop-down menu: All, Documents, Folders, Apps, Settings, Photos, Videos, or Music.
- **Web:** Choose this category to stop searching through the computer and instead directs the search directly to the Internet. Your web browser opens web pages that match your search. See Figure 837-, for example, when searching for Sheikh Al-Islam Ibn Taymiyyah, you will see several links that talk about the Sheikh once the first words of the search term have been written.



**3. The selection of the item that matches your search to be opened and displayed on the screen.**

Click on the file that matches your search directly from the list and it will open in the application corresponding to the file type. You can also find the location of the file on your device by right-clicking on the file in the list and you will find the phrase “Open file location”, which indicates the location of this file on your device.

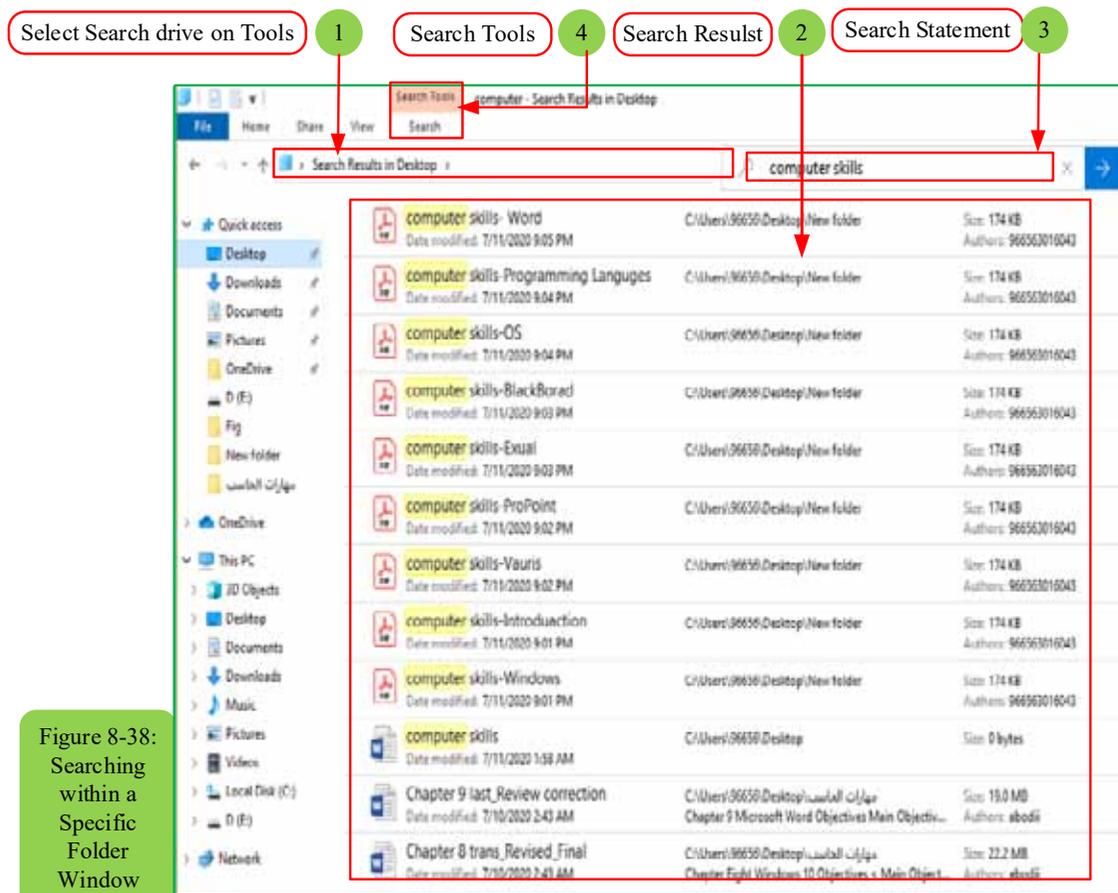
**To get the most out of the search feature:**

- For more speed in the Windows search tool, the search box lists files that contain only names that match your search term. While this strategy sometimes helps you to find quick matches, you will not find what you are looking for accurately unless you complete your search statement, then choose the search scope if you want files on your device or links on the Internet.
- Do not press (Enter) after typing in the search box. If you do this, Windows will call the first item in the search menu, which may not be what you want. Wait to see what matches your search, then click on the file or link you want.
- The Windows search tool scans every file in your documents, music, photos, and videos, which makes the storing of your files in those folders more important than ever.
- Windows Search Tool also scans every file you store on OneDrive, even if these files are not stored on your computer as well.
- Windows does not search for files stored in removable devices, such as flash memory, CDs, DVDs, or portable hard drives.
- If you are searching for a common word and the Windows search tool checked too many files, you can limit your search results by writing a short phrase for the word you want. The more words that you write, the greater your chance to define a specific file.

**Skill 8- 28****Using the Search Box in Windows Browser for Files****8-8- 2 Search through “search-box” of the files browser**

The results of the search tool in Windows can be excessive when you search within one folder on your device, as you search for a missing file inside only this folder. To solve this problem, Windows includes a search box for each folder through the Windows files browser. This search box limits the search to the files within this folder.

To find a missing file in a specific folder, click inside the folder search box and start writing a short word or phrase that indicates your missing file. Once you start writing letters and words, Windows starts filtering files inside your folder and continues to narrow your search until it displays a few files inside this folder as shown in Figure 8-38.



When the search box of the folder identifies a large number of possible matches, enter some other utilities through the “Refine” tab at the top of the filesbrowser to determine the best results. For example, select the option “date modified” to get the most recently modified files at the beginning, as shown in Figure 839-.

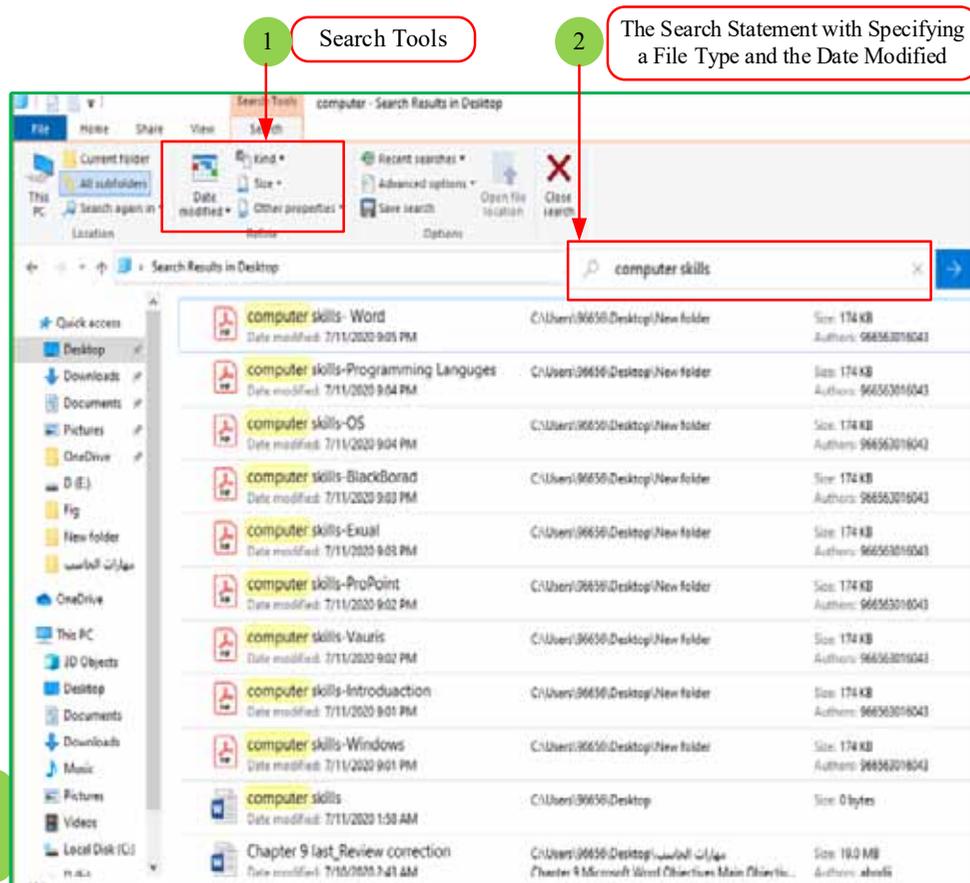


Figure 8-39:  
Refining the  
Search Tools

### 8 -8- 3 Search through Cortana digital assistant

**Skill 8 - 29**  
The Use of Cortana Digital Assistant of Windows 10



Windows 10 includes a friendly personal digital assistant called Cortana. Cortana is trying to simplify your life by finding not only your lost files, but also some information about you and your surroundings - for example, local weather updates, traffic information around your home, or perhaps a list of popular restaurants nearby. Cortana can even remind you of important dates and events. In fact, you can meet Cortana: because it is the mind next to the search box of the Start menu.

Cortana is constantly listening through the microphone on your computer and waiting impatiently for the term “Hey Cortana”. When Cortana hears these two words, it listens closely to the search statement and begins processing your request, as shown in Figure 840-.

Unfortunately, Cortana is not activated in some geographical regions, but you can use it if you change your geographical area and language in Windows settings to the United States of America and the English language, for example.

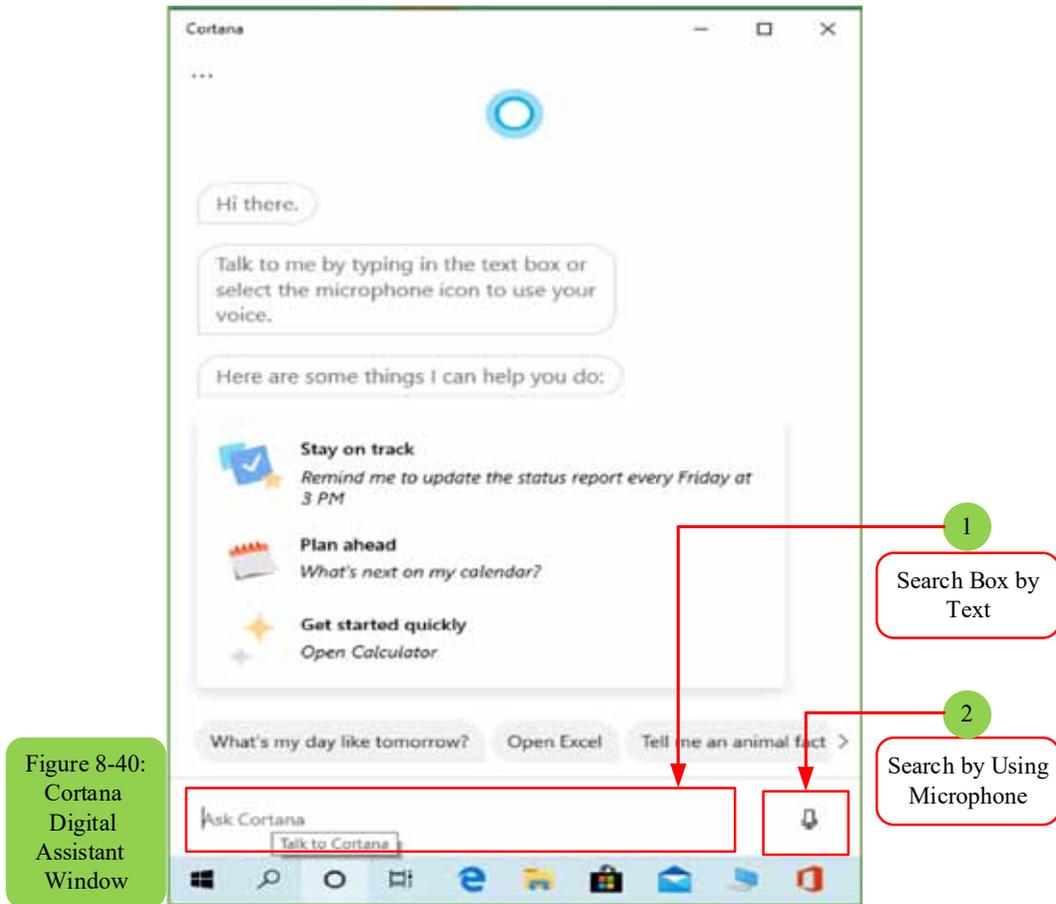


Figure 8-40:  
Cortana  
Digital  
Assistant  
Window

## 8-9 Windows Personalization through Control Panel

**Skill 8 - 30**  
Identifying the Two Control Panels in Windows 10



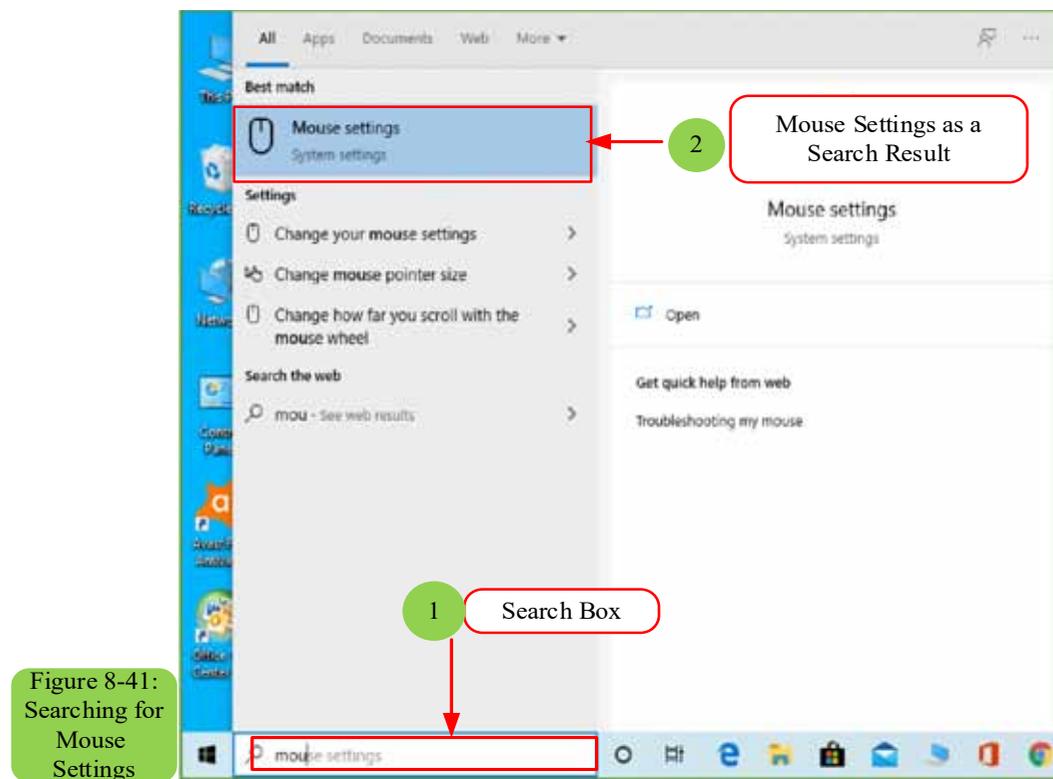
**Windows 10 has two control panels that you can switch between:**

- **Settings:** Settings can be accessed easily with oversized buttons. These buttons are now available with many other buttons that you may miss lots of operations without it.
- **Control Panel:** The control panel from the previous Windows version is still the same as in Windows 10.

Now, you do not have to disturbance from multiple buttons and the need to switch between two ways to access the required settings and enter the various

menus to find a way to change the settings of an application or attached device. Simply follow these two steps to get what you want:

1. Click the Start button, or click the adjacent search box, and type the search word describing the desired Setting. When writing the first letters, each Setting containing those letters will appear at the top of the search box menu. If you do not know the exact name of your setting, start typing the keyword like display, mouse, user, privacy, or something that describes your need.
2. Click the desired setting on the list. Windows takes you directly to the appropriate component for this setting in the control panel, as in Figure 8- 41 to search for mouse settings.



### 8 -9- 1 The Settings

**Skill 8 - 31**  
Working with the Settings in Windows 10



To open the Settings, click the Start button and click the word Settings near the bottom of the left pane of the Start menu. The Settings appears, as shown in Figure 8- 42. In fact, the Settings look almost identical to whether you're watching Windows 10 on a computer, tablet, cell phone, or even on a TV set.

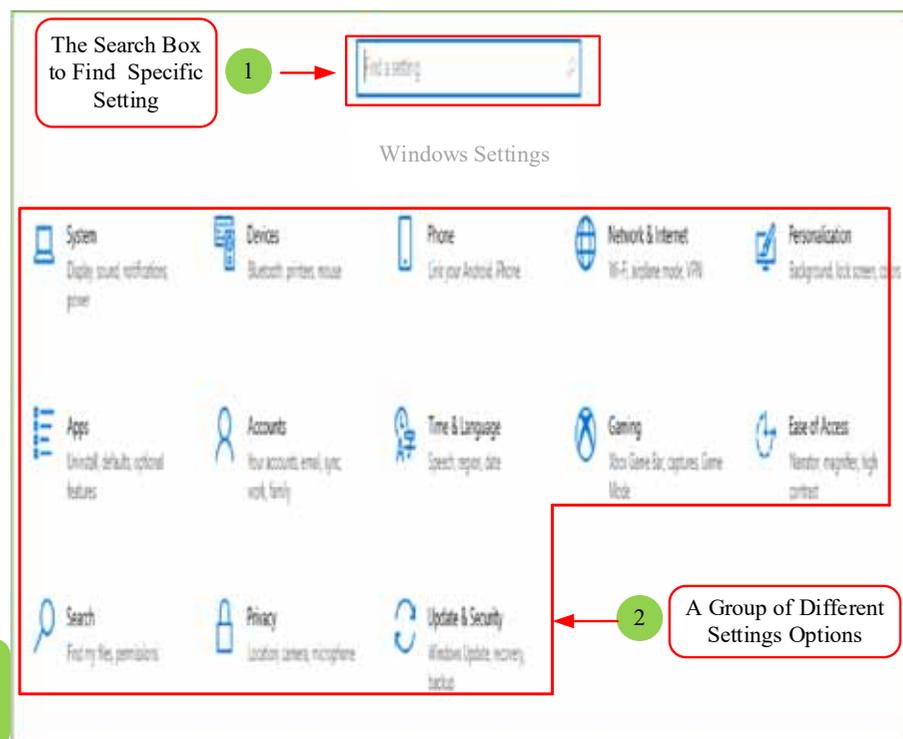


Figure 8-42:  
Windows10  
Settings

**The Settings divide into the following categories:**

- **System:** This huge category combines all settings related to the computer system. For example, you can find ways to adjust the screen, set the notification and events, adjust the power, storage units, etc., and even you find settings for how the Maps app interacts when you disconnect from the Internet.
- **Devices:** In Windows, devices are your physical items like a mouse, keyboard, printer, scanner. Thus, this field allows you to set the scroll wheel of the mouse, as well as how the computer interacts when inserting a memory card. Briefly, it is a mixture of settings that you find mostly by searching in the search box of the Start menu.
- **Network and Internet:** The settings for a Wi-Fi network on your default network are through the establishment of mobile internet connections, and others related to network and internet settings, you can find them all in this category.
- **Personalization:** In this category, you can choose a new desktop or screen lock photo, and the welcome's photo when your computer starts up. You can also customize parts of the Start menu, etc.
- **Apps:** In this category, you can add or remove an application, and you can change application settings or move them from the device to a secondary storage medium, etc.

- **Accounts:** Here in this category you can create or change accounts of users use the computer, as well as to delete the accounts of those who are no longer welcome to use the computer. This category also allows you to change the password or account picture. If you are working on more than one computer, you can go to the Sync Your Settings section to control which settings should be linked to your Microsoft account.
- **Time and language:** Often you enter this category once at the start of setting up your device and forget about it afterward. It allows you to change your own time zone, adjust the time, date, and the corresponding formats for your region and set other settings related to your language and geographic location when the region changes.
- **Ease of Access:** These settings make Windows more suitable for persons with disabilities in vision and hearing.
- **Privacy:** Unfortunately, in this era, there is a little space of privacy left for us on the Internet! However, this section allows you to see the controls that Windows provides for you to limit the information that apps and websites gather around you. For example, you can control the apps that can access your site and control the camera, as well as those that can see your contact list.
- **Update and security:** You can often enter this category to set up your file to determine the backup date. Also, to familiarize yourself with the recovery area which provides powerful tools for troubleshooting.

### 8-9-2 Desktop Control Panel

#### Skill 8 - 32 Working with Control Panel of Windows 10



Although Windows 10 greatly supports the settings, sometimes you may need the control panel. This is because the Desktop Control Panel allows you to open Windows icons and setting tools. Part of the control panel's attractiveness and power is because it has about 50 icons, and some icons require menus with dozens of settings and tasks. It is also familiar because many of its settings have not changed in more than 20 years.

To open the Control Panel on the desktop, right-click the Start button and choose Control Panel from the pop-up menu.

To avoid searching for a long time to obtain the correct control icon, the control panel groups similar elements together under one category icon, as shown in Figure 8 -43.

Like Settings, the control panel monitors the search box in the upper-left corner to find settings that deal with a specific topic. If you move your mouse pointer over a main category, the control panel describes the settings available within that category.

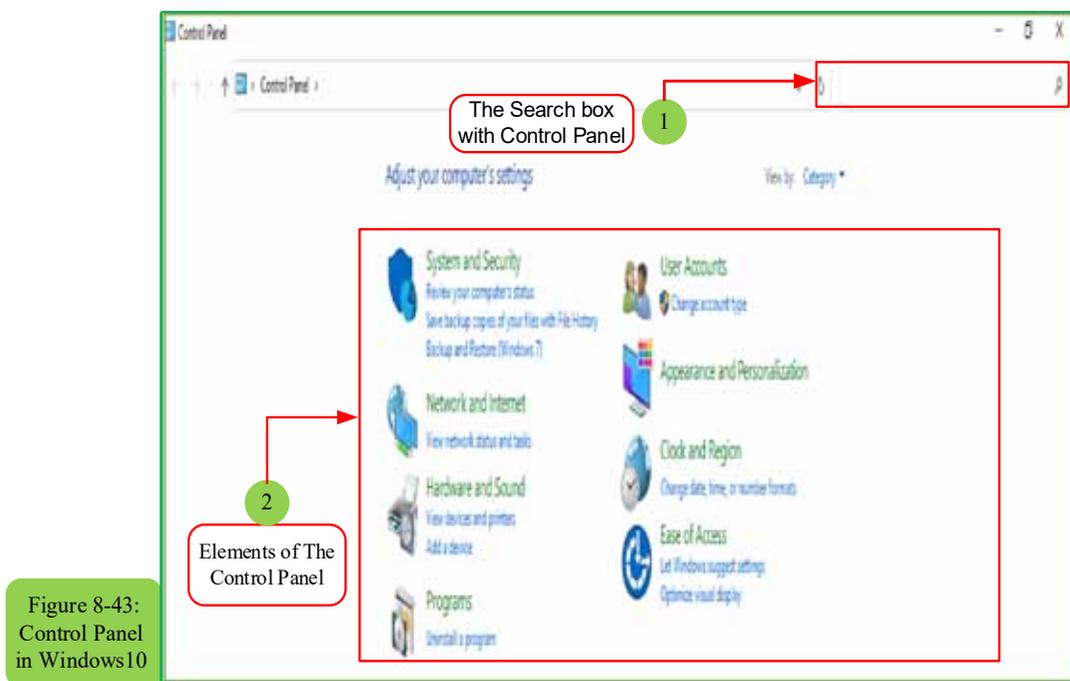


Figure 8-43:  
Control Panel  
in Windows10

Some setting icons may not fall neatly within a category, even they may not be included in any category. To see each icon provided by the control panel, choose either large or small icons from the drop-down menu next to the word “View by”, as shown in the upper right corner of Figure 844-. The window quickly displays all control panel icons.

The contents of the control panel may vary from device to device, as shown in Figure 8- 44. Because different programs and other computer accessories often add their own icons to the control panel. Also, different versions of Windows may also have slightly different icons. Leave your mouse pointer over any icon or category in the control panel, and Windows will explain its meaning.

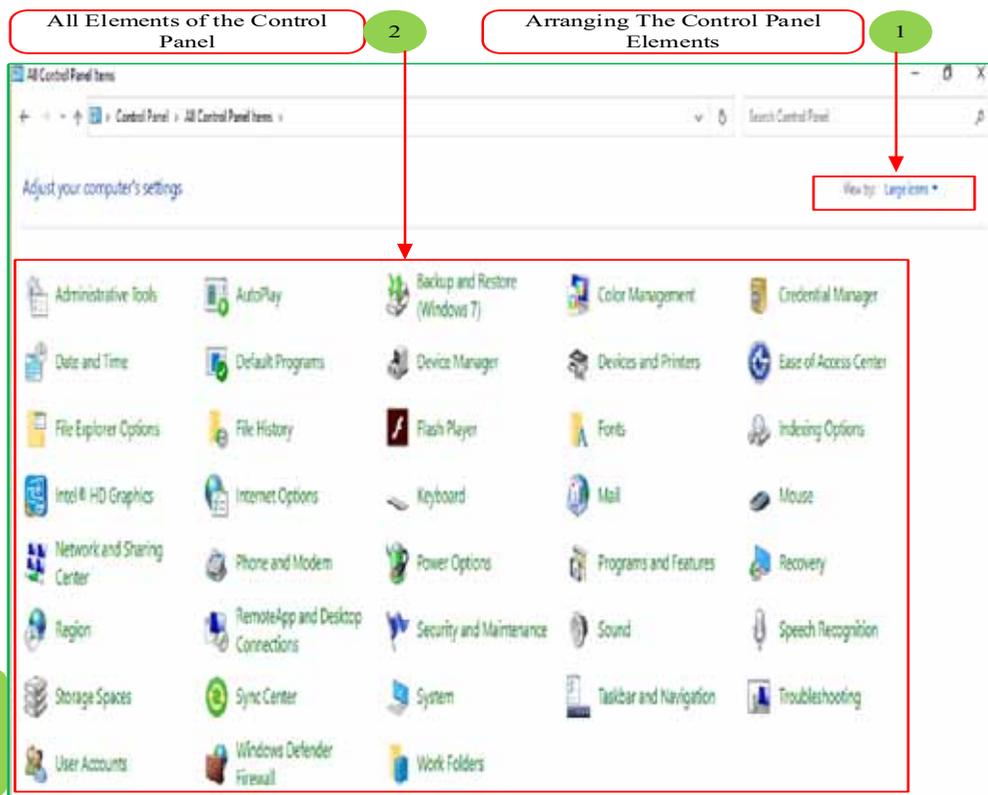


Figure 8-44: Elements of The Control Panel in Windows 10

## 8- 10 Add or Remove Apps or Programs

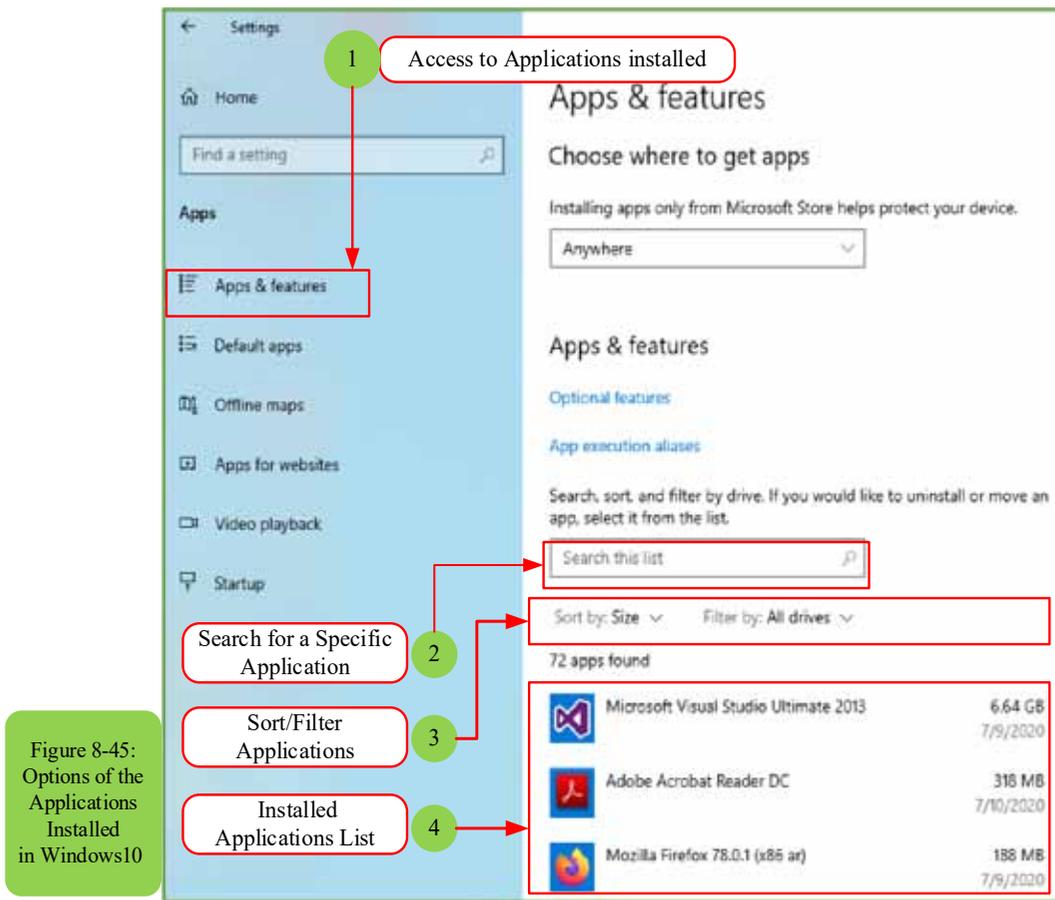
**Skill 8- 33**  
Add, Remove or Modify Apps and Programs in Windows 10



Removing the application from your Start menu does not take much effort. Just right-click the app name from the Start menu and choose Uninstall from the popup window. But this procedure does not completely remove the app from your device! Rather, the application is removed only from the Start menu.

**To completely remove the app or program from your computer, follow these steps:**

- Click the Start button and choose Settings from the menu, the Settings will appear.
- Click the App icon, when the app’s window appears, click Apps and Features at the left pane of the window. The Installed Apps and Features window appears, as shown in Figure 8- 45, where the currently installed apps and programs are listed according to size.



To sort programs by installed date, click the “Sort by” button and choose “Installed on” from the pop-up menu.

- Click the program you want to remove, then click the Uninstall or Move button.

Depending on which button you click on, Windows either removes the program or app from your computer or moves it to another drive or memory card.

- In case of using a tablet, click on one of the listed programs, and two buttons appear below it:

- **Move:** When your storage space is exhausted, choose this option. It allows you to move the app or program from your tablet device to the memory card, and free up space for your files.
- **Uninstall:** Click on this button - then on the Confirm button - to completely remove the app or program from your computer.

**Skill 8 - 34**  
Adjusting Time and Language Settings in Windows 10



**8- 11 Time and Language Settings**

Microsoft designed the time and language area mostly in the settings for travelers to different time zones and other locations. Users of desktop computers usually see this information only once when first setting up the computer. Windows later remembers the time and date even when your computer is turned off.

As for users of laptops and smart devices, they will need to enter that region when visiting different time zones at a universal time. Computer users will also enjoy the bi-lingual computer feature, with settings that allow characters from different languages.

To change language and time, click the Start button, choose Settings from the menu, and click the Time and Language category. Three sections appear as in Figure 8- 46:

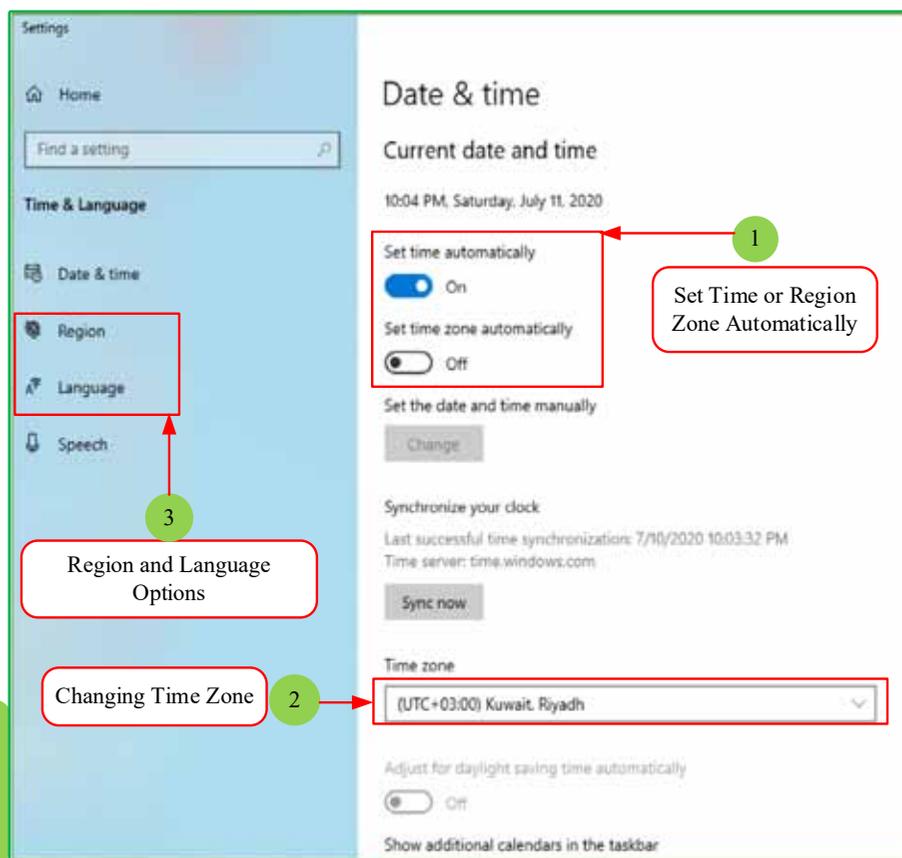


Figure 8-46:  
Date and Time  
Options  
in Windows10

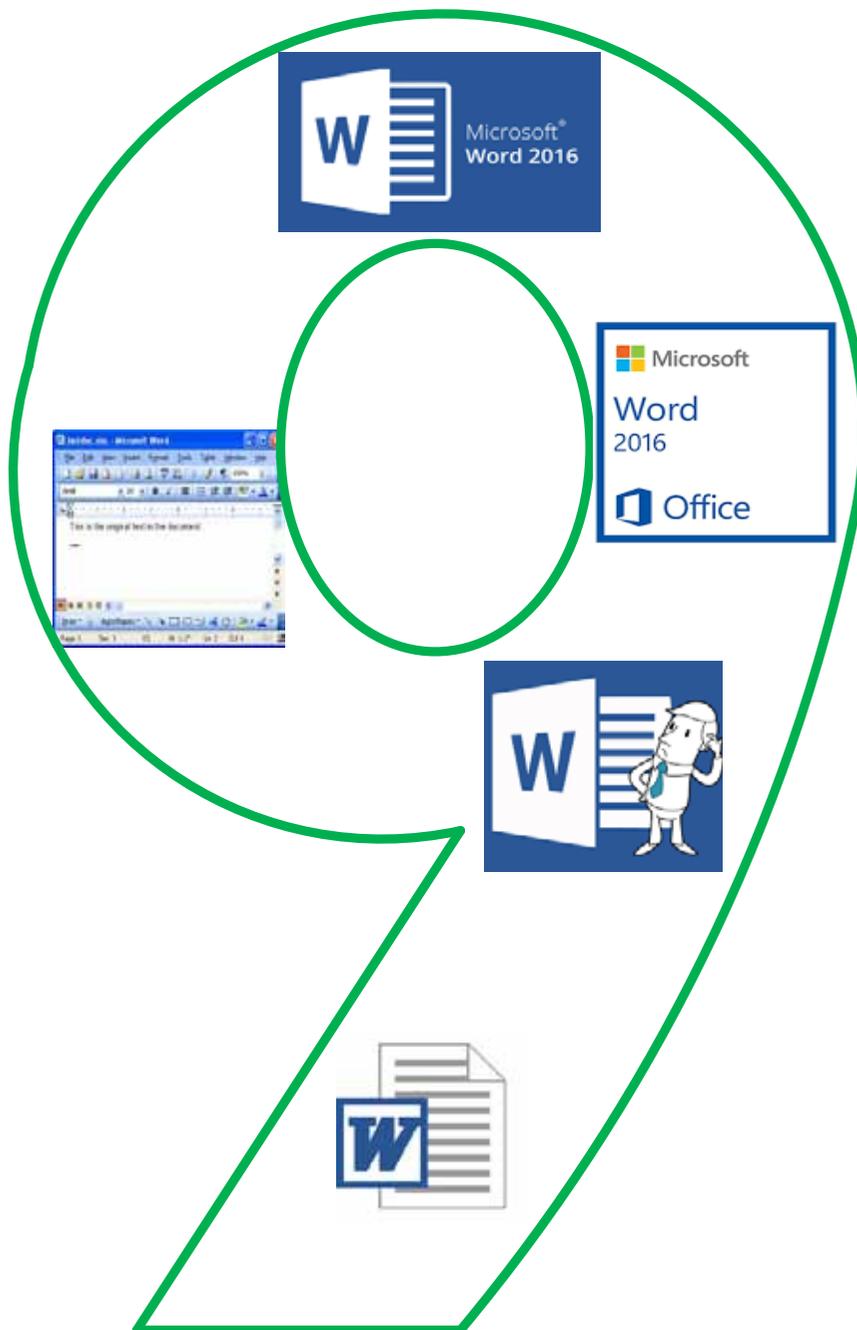
- Date and time: This area is somewhat self-explanatory. (it allows clicking on the taskbar clock and choosing to change the date)
- Region and Language: If you are bilingual or multilingual, move to this area when working on documents that require letters from different languages.

***Use the control panel with your laboratory teacher to perform the following tasks:***

1. Create a new user account on your device.
2. Change your profile picture and password.
3. Change your desktop wallpaper.
4. Handle the selection of a screen saver.
5. Change the themes of the computer.
6. Change the screen resolution.
7. Adjust sounds and its intensity.

# Chapter 9

## Microsoft Word







## Microsoft Word 2016

### Objectives

#### ➔ Main objectives:

1. Dealing with Microsoft Word2016

#### ➔ Sub-Objectives

It is expected from the student after studying this chapter, to master the following knowledge and skills:Recognize the operating systems and their main functions and types.

1. Identifies word2016 interface elements.
2. Creates a new file in Word 2016.
3. Recognizes and deals with Wordtemplates2016.
4. Knowshow to manage and edit documents.
5. Knowshow to view and print documents.
6. Knowsabout the basic editing processes and patterns.
7. Knows searches and inferences.
8. Knows the insertion of the head and the tail of the page.
9. Knowsinseration of illustrations graphs
10. Recognizes the inclusion of shapes and symbols.
11. Master the insertion processes of Tables



## 9 -1 Introduction to Microsoft Word 2016:

Microsoft Word 2016 is one of the most important programs produced by American Microsoft company for text processing, and it is used by millions of users around the world to manage office business by providing the latest editing and auditing tools for writing documents, messages, researches, and coordinating various processes on them and preparing them for printing, sharing or transmitting.

### *Microsoft Word Features 2016:*

*Word 2016, the latest version of the word processing software package, it has many of features, including:*

1. Co-authoring with anyone anywhere: It is possible to co-work on the same Word document at the same time as a many of people who can edit the document and co-output it.
2. Share simplified documents: it is possible to shared as well as access to Word documents saved in SharePoint or OneDrive
3. The ability to send large files using One Drive: The user can save large files in the OneDrive cloud storage service
4. Smart Search: One of the most important features of Word 2016 is smart search through which a word can be identified within the specific document and then we click the right mouse button to do a search for that word through Bing search engine.
5. Charts and graphs: A new set of charts and longitudinal and horizontal squares were more flexible and evolving than previous versions.
6. SKYPE Integration

This feature enables businessmen to use SKYPE from within Word, now you can answer video calls or messages without having to exit the document that's working on it.

## 9 -2 Starts Using Word 2016:

### *9 -2- 1 Running Word Processing Software (Word 2016):*

**Skill 9 - 1**  
Running the Program from the Start Menu



*To run the program from the Start Menu follow the following steps:*

1. Click the left mouse button on the Start button.
2. A list of all programs and applications installed on your computer is appeared and click on 'Word 2016' as in figure (9 -1), the program will start running.

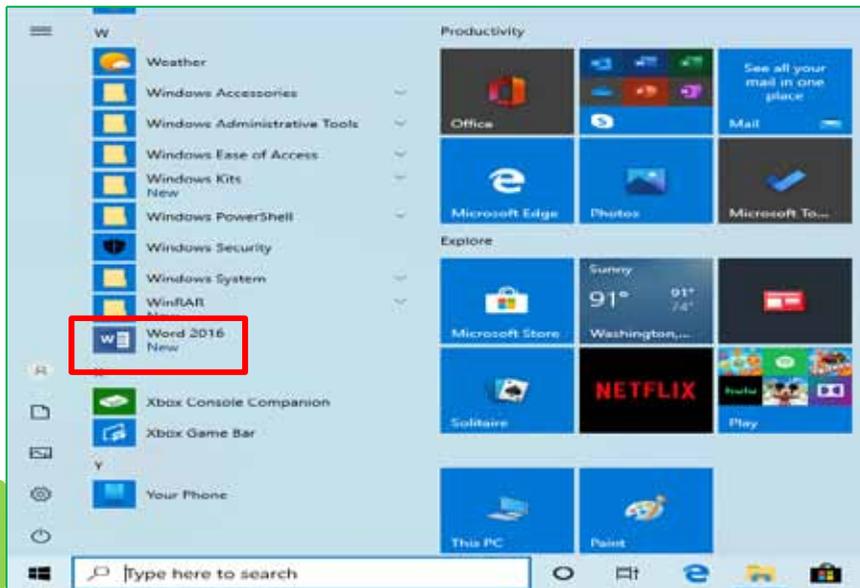


Figure 9-1:  
Running MS  
Word by  
Using Start  
Button

**9 -2- 2 Close the Word Processing Software (Word 2016):**

### Skill 9 - 2

## Close the Program

*To close the program, follow the following steps:*

- Click with the left mouse button on the 'Close' icon in the address bar at the top left of the window that ends the program as figure (9 -2)



Figure 9-2:  
Close MS  
Word  
Programs

9-2 -3 Components of the Text Processing Window (Word 2016):

**Skill 9 - 3**  
Knowing the Components of the Program Window

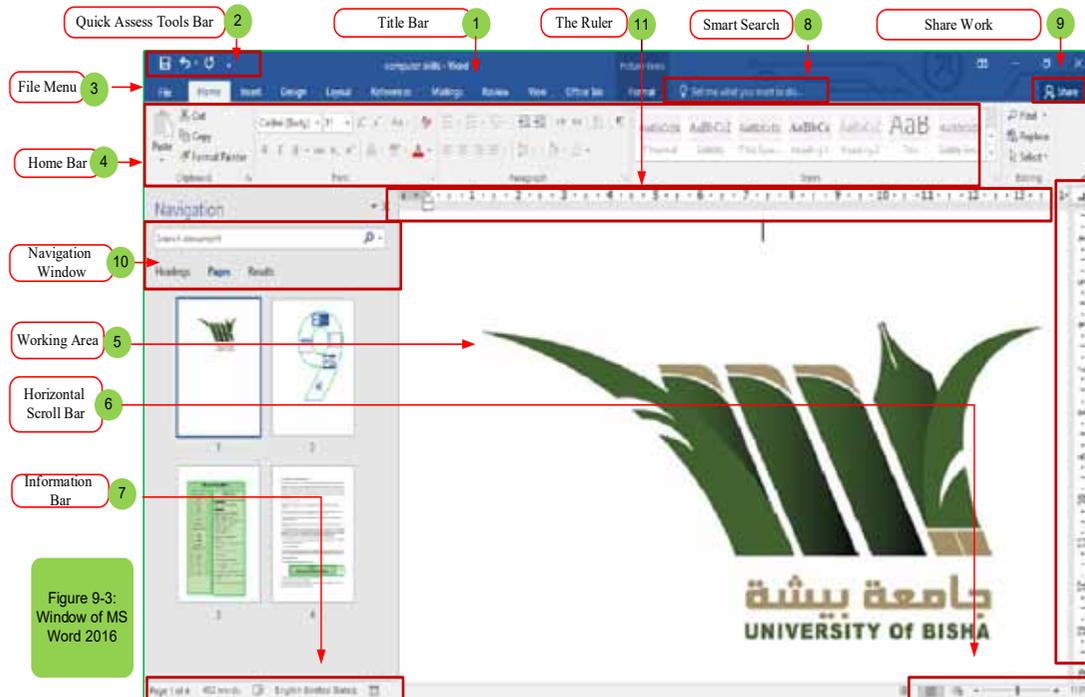


Figure 9-3:  
Window of MS  
Word 2016

1. Title Bar: Displays the file name of the edited document and the name of the program you are using and also includes the usual control buttons (zooming out, restoring, closing)
2. Quick Access Toolbar: Contains commonly used commands such as (save, undo and replay) and at the end of the Quick Access toolbar there is a drop-down menu where you can add other commands that you use or need a lot.
3. File tab: Through which processes are interacted on the document itself and not with its content (new, open, save as, print, close.)
4. Ribbon: A set of toolbars at the top of the program window after the address condition to help the user access commands.
5. Work Area: Displays the contents of the document you edit.
6. Horizontal scroll bar: Allows you to change display options by using a scroll (zoom) to control the size of the document window.
7. Status bar: Displays information about the document you are editing (number of pages words, etc).

8. Intelligent Search: Allows you to search for Word commands, get help and search the web
9. Work sharing: Allows you to share work with others by inviting specific people to view and edit archived documents on the cloud.
10. Navigation window: Allows you to navigate document pages and navigate within the document
11. Rulers: Allows you to adjust the width and length of the page and there are two horizontal and vertical rulers that can be controlled by showing and hiding.

**9 -2 -4 Create Blank Document:**

### Skill 9 - 4

## Create Blank Document



*To create an empty document, follow the following steps:*

1. After opening the program click on the template 'Blank Document' with the left mouse button and a document will be created and opened. If you want to create a new document in another way, click 'File', click 'New' and click on the 'Blank Document' template, see Figure (9 -4)

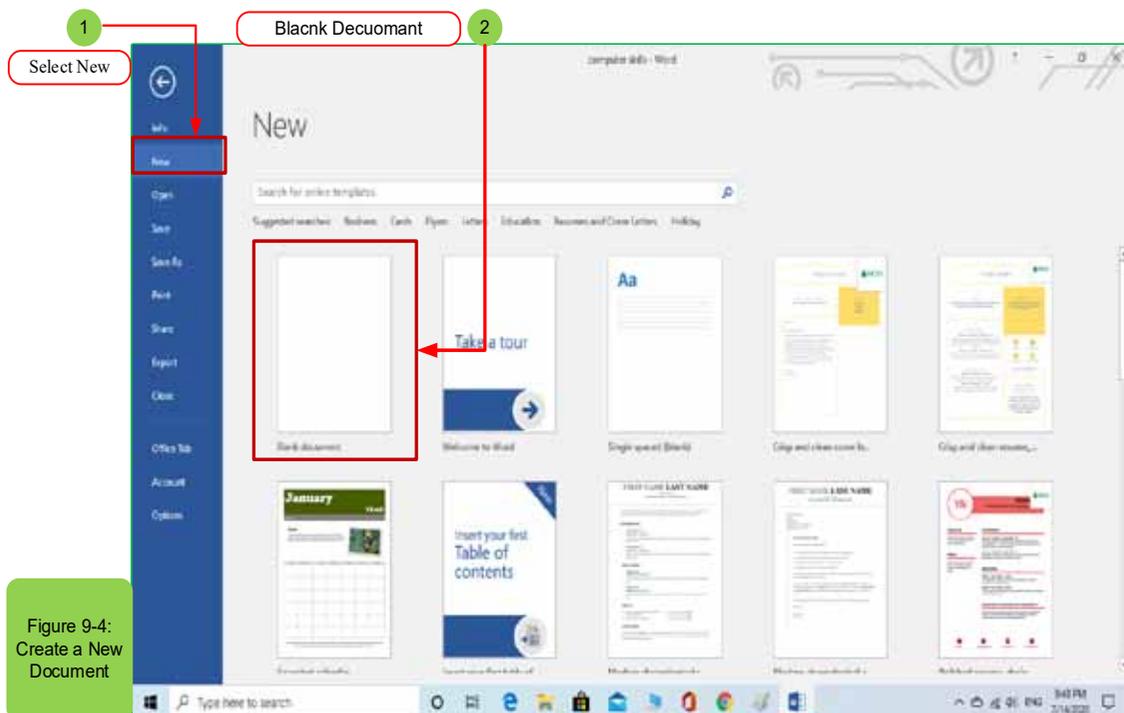


Figure 9-4:  
Create a New Document

**9-2-5 Create Document Using Word 2016 templates:**

**Skill 9 - 5**  
Create Document Using Word 2016 templates



There are two types of templates, namely Word 2016 and online templates, word 2016 templates have been installed and stored on the computer, when installing the word processing software and the program includes a wide range of templates enough to get started.

To create a document using ready-made Word2016 templates, follow the following steps:

1. Click the left mouse button on the <File> tab
2. Click on <New> window will appear with a number of ready-to-use templates
3. Choose the suitable template for you, for example, we want to choose a template to create a resume file that we select and then click on <Create> as the form (9 -5)

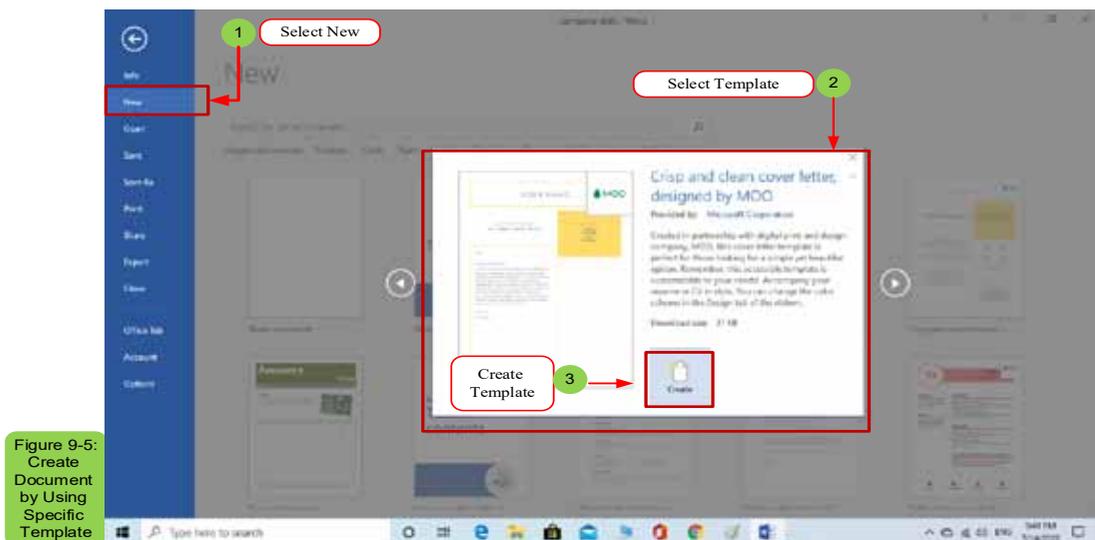


Figure 9-5:  
Create Document  
by Using  
Specific  
Template

**9-2-6 Create Document from Online templates:**

**Skill 9 - 6**  
Create Document from Online Templates



**To create a document from the internet, follow the following steps:**

1. You must have an Internet connection.

2. You must have an Office login account and office.com site will provide to you a many of ready-to-use templates.
3. To search for a template from the Internet choose from the <new> file tab, then type the name of the template in the <Home page> box as in the figure (9 -6), then click on <Search> the search results for the template you selected for example we want a certificate template.
4. You'll also find templates created by Word 2016 word processing users who have uploaded their work to share with others.
5. To create a document of online templates choose the template category online and select the style you want and click on a download.



Figure 9-6:  
Create Document by Using Internet Template

**9 -2- 7 Save Document:**

### Skill 9 - 7

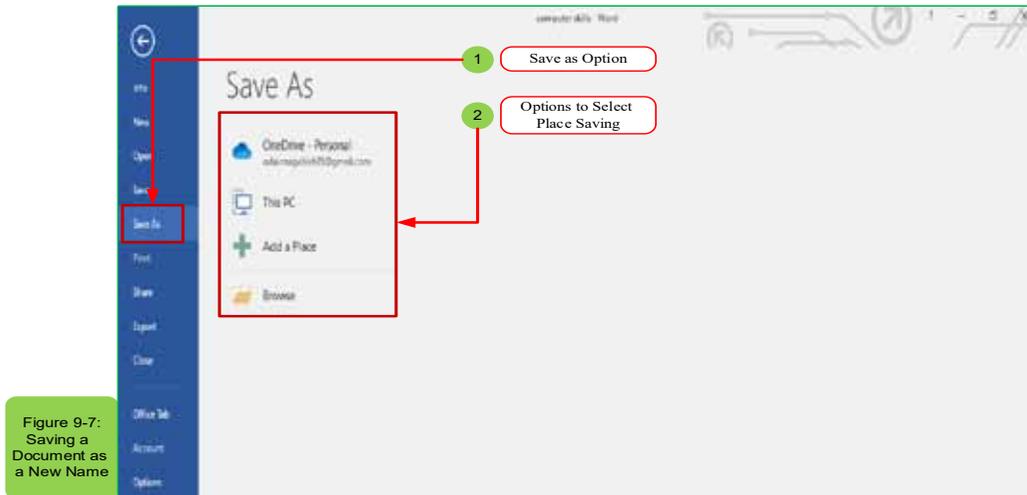
## Save Document



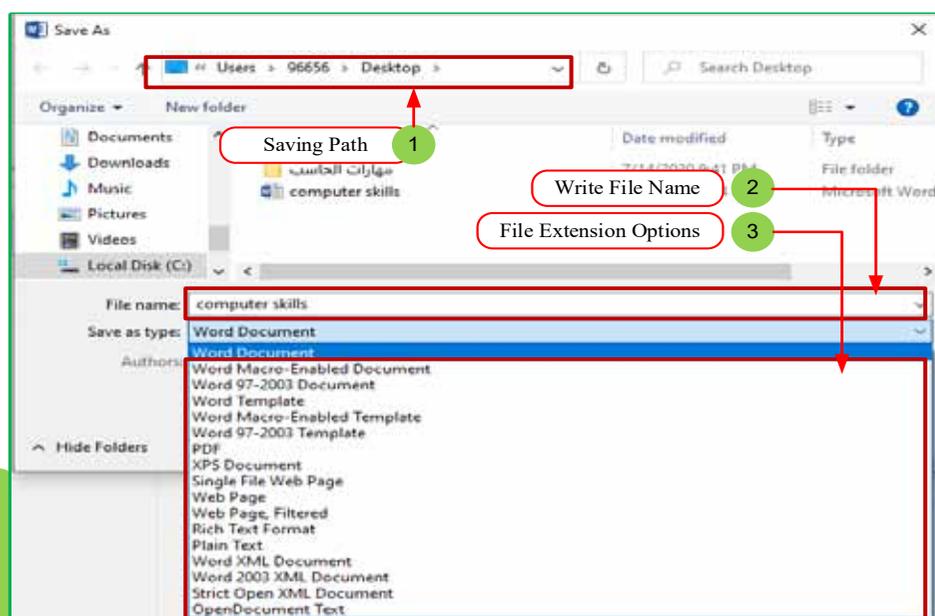
Newly created documents that usually saved in the name of a particular file that is closely related to the content of the document so that you can locate the file as quickly as possible after editing your existing document. You can choose to save that document in the name of a new file or format a different file, when you save a document such as the cloud and 'OneDrive' you can access this document on any computer or tablet and can share it with others.

**To save a document in the name of follows the following steps:**

1. From the 'File' tab click on 'Save as a Name'
2. A saved dialog box with a name with save place options will appear either on your PC or on a different place such as One Drive or adding another place as in figure (9 -7)



3. The file save window will appear, in the file name box write the file name for example computer skills and then choose the type of document (if you press the save button the file will be saved by the type (docx) and in the document folder) by default and then close the document as figure (9 -8)
4. Or you can save from the Quick Access toolbar or quick save by clicking on ctrl+S keys.
5. Click 'OK' to save.



**9 -2- 8 Open Document:**

**Skill 9 - 8**  
**Open Document**



Word 2016 provides the possibility to open the last files as well as the oldest files.

1. From the 'File' tab click on 'Open.'
2. The navigation part will appear as the figure (99-)

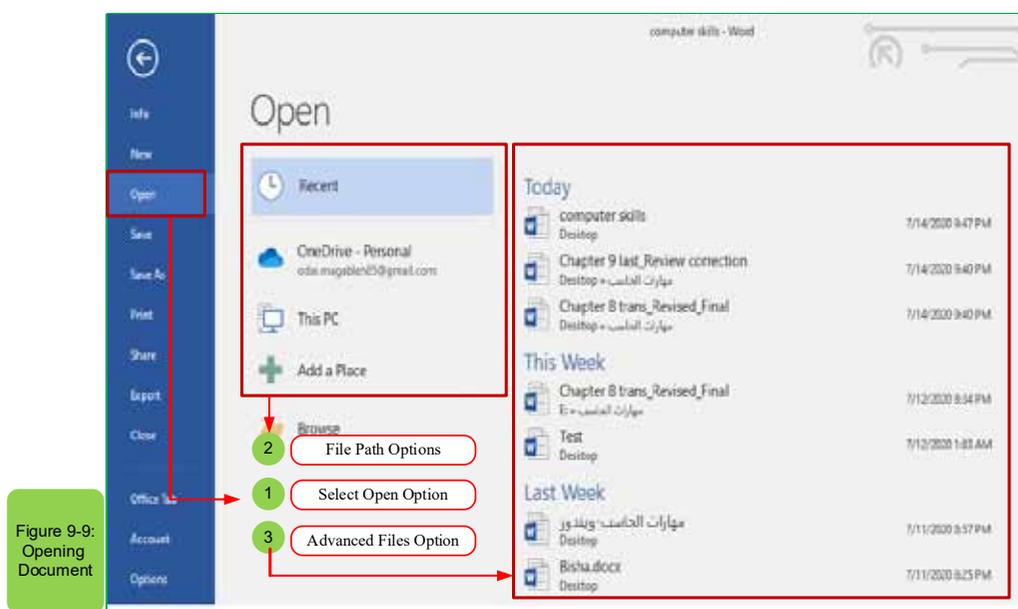


Figure 9-9:  
Opening Document

3. Click on the local disk that contains the work files, then double-click the folder that contains the document, and then double-click to open the document.

**9 -3 Basic Editing Processes:**

**9 -3- 1 Select and Edit Text:**

**Skill 9 - 9**  
**Select Text**



*You must first select and edit the text to do so follow the following steps:*

1. Select text using the keyboard or with the mouse.

2. If you use the mouse to select the text, click with the constant pressure and drag of the mouse.
3. If you use the keyboard to select the text click on the SHIFT key and the appropriate arrow of directions arrows
4. The text will appear shaded (usually in blue) when it is selected as the figure (9 -10)

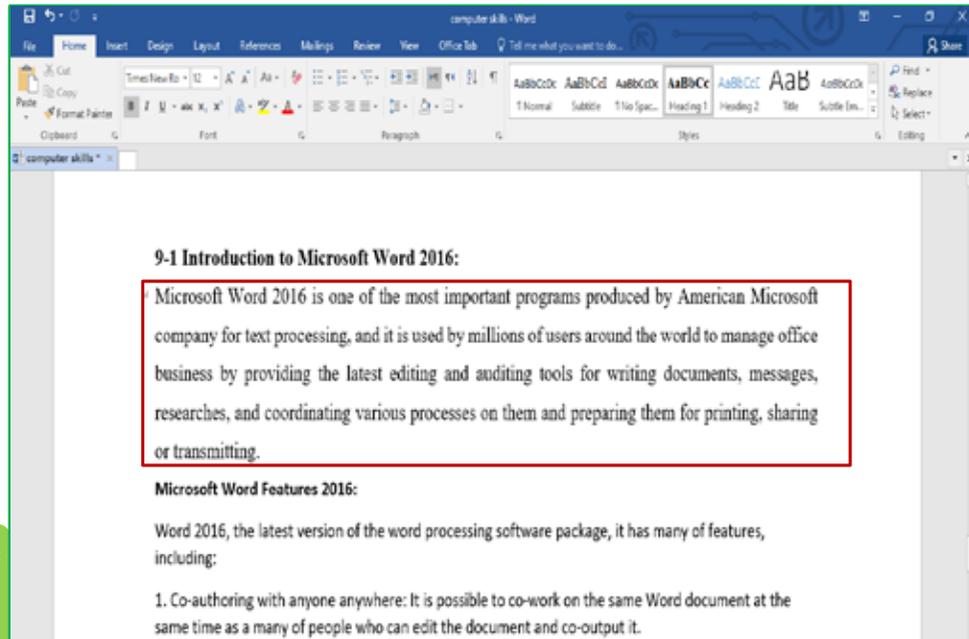


Figure 9-10:  
Selecting  
and Editing  
Text

Deleting Letters and words without being selected using keys:

To delete the letter that precedes the writing indicator	Backspace
To delete the text from the writing indicator to the beginning of the word	Ctrl+Backspace
To delete the letter that follows the indicator	Delete
To delete the text from the writing indicator to the end of the word	Ctrl+Delete

### **9- 3 -2 Navigation, Search and Replacement:**

- Use the navigation tool to find text within the document:

**Navigate within the document can be through using the following means:**

1. The Mouse
2. The Keyboard
3. Scrolling bars
4. Dialogue box Go to

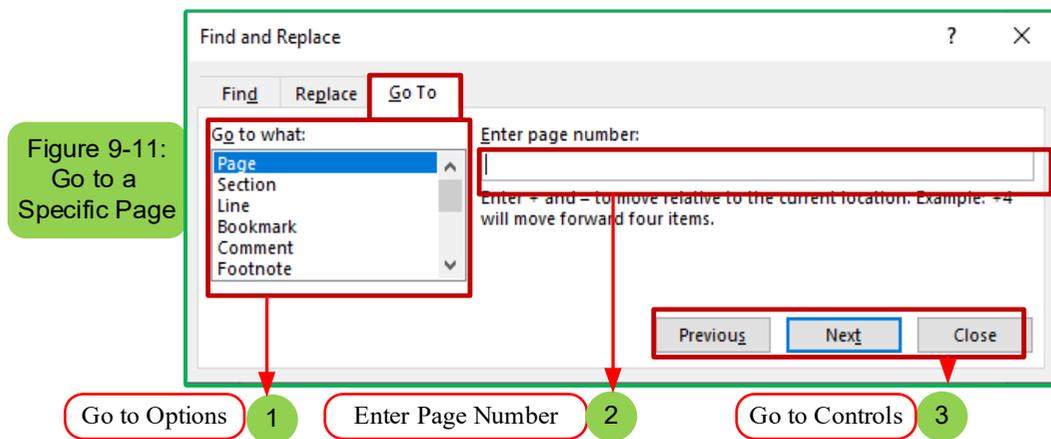
● Using Dialogue Box Go to:

**Skill 9 - 10**  
Move to Inside the File



To use the move to dialog box follow the following steps:

1. From the 'Home Page' tab and from the 'Edit' group click on the icon's arrow 'Search' at the far left of the 'Home Page' tab and click on 'Go to'
2. The 'Search and Replace' window will appear from which the 'Go To' will appear as in figure (9- 11)
3. Write down the page number to which you want to go.



● Search:

**Skill 9 - 11**  
Serach in the Document



With Word2016, you can search for a word or phrase within the document, or search for a specific text and replace it with another text to search for a word within the document follow the following steps:

1. from the 'Home Page' tab and from the 'Edit' group click on 'Search' icon
2. The 'Search and Replace' window will show which choose 'Search'
3. Type the word you would like to look for, for example, the word (insert) as in figure (9- 12 )
4. Click on (Find the Next)

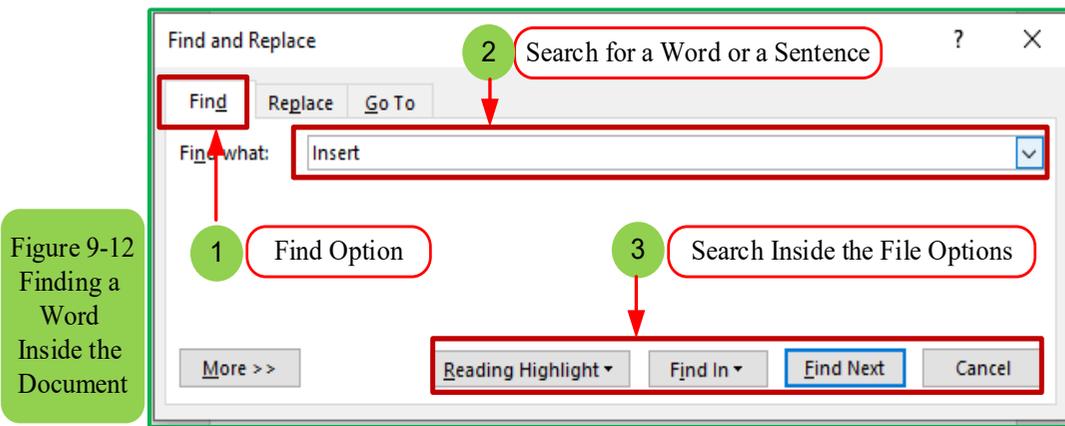


Figure 9-12  
Finding a  
Word  
Inside the  
Document

5. The result of the search inside the document will appear shaded as it appears in figure (9- 15)

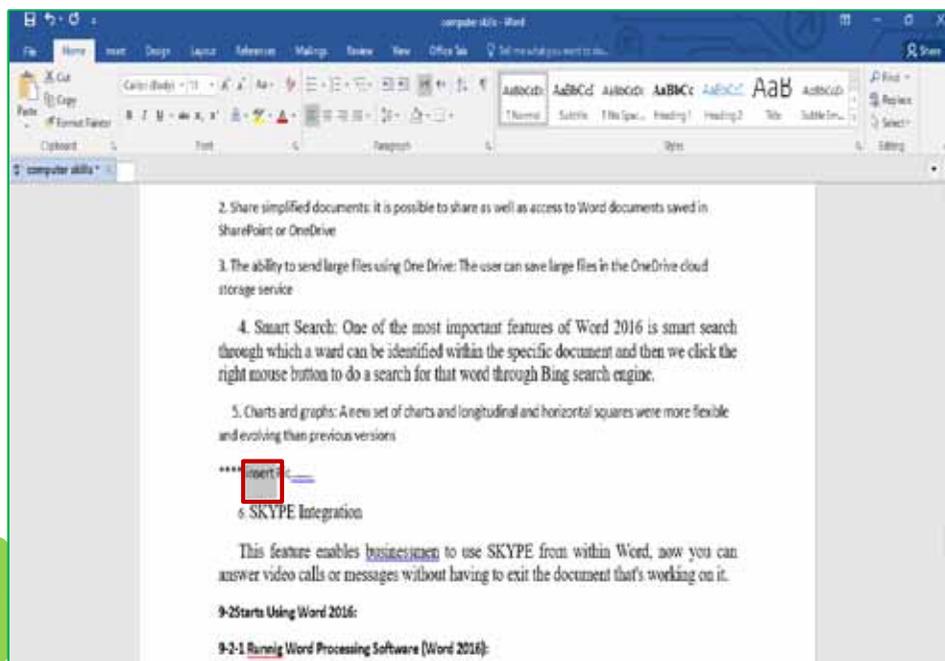


Figure 9-13:  
The Searched  
Word Result

• **Replacement:**

**Skill 9 - 12**  
**Serach and Replace**



Replacement is used to search for a word within the document and replace it with another word, for example, to replace the word 'pattern' instead of 'thesis', we follow the following steps:

1. From the 'Home Page' tab and from the 'Edit' group click on the icon 'Replace'

2. The 'Search and Replace' window will appear from which to choose 'replace.'
3. In the search box write the word you want to replace
4. In the dialog replaces type the word to be placed instead of the replaced word as in figure (916-)
5. Click the 'Search for next' button where the first appearance of a word that matches what was written in the search box is selected.
6. Then click the replacement button to replace the word as the figure (914-)
7. There are options for replacement (replace, replace all, search for the next, cancel the order) you can use as needed for replacement.

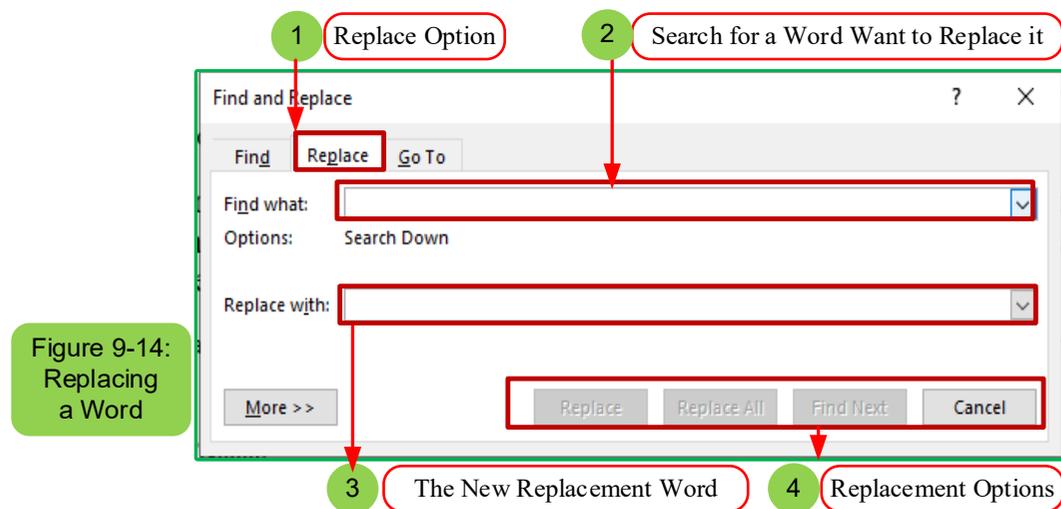


Figure 9-14:  
Replacing  
a Word

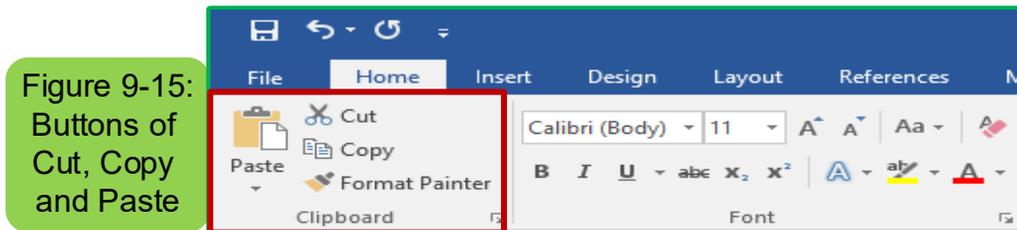
### 9- 3- 3 Cut and Copy and Paste:

**Skill 9 - 13**  
Cut and Copy and Paste

**Cutting, copying and pasting skills are main skills in Word 2016 and to use these skills we follow the following steps:**

1. Select the text you want to copy or cut.
2. Click the cut button or copy from the 'Home Page' as in figure (915-)
3. Or you can right-click on the text and choose 'Cut' or use the Ctrl + X shortcut.
4. Click with the right button in the place you want to put the text and choose 'copy' or use the Ctrl + C shortcut.

5. Click with the right button on the text and then choose «paste» or use the «Ctrl+ V.» Shortcut or from the «Home page» tab and from the «Clipboard» group click the «Paste» button as figure (9- 15)



## 9 -4 FormattingProcesses:

Text format is the processes that are made on the text and include (change the size font and colour, style, and other formats)

### 9.4.1 Copy Format:

The text format can be copied within the same document or between other documents.To copy the text format:

1. Select the text that contains the format you want to copy elsewhere.
2. Click the «Copy format» button in the «Home page» tab as in figure (916-) or you can use the shortcut (Ctrl+Shift+C) from the keyboard to copy the format
3. The cursor will turn into a drawing brush.
4. Choose the new text and it will take the same old text format.

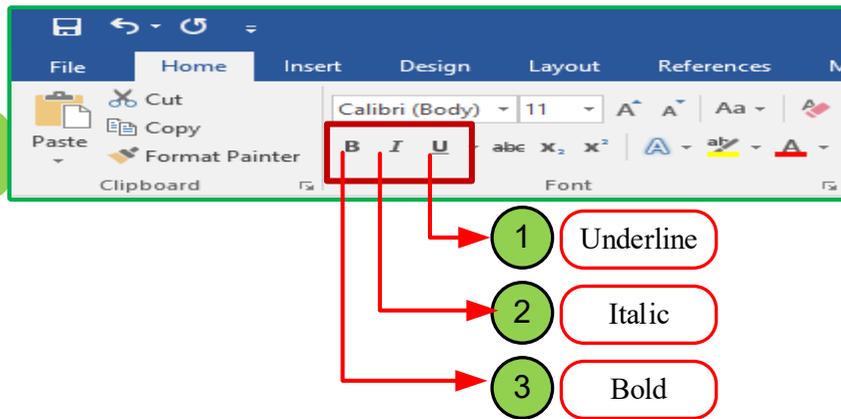
### • 9.4.2 Italic, Bold,Underline:



**To apply a format (Italic, bold, and underline), follow the following steps:**

1. Select the text you want to format.
2. From the 'Home Page' tab and from the group's 'font' click on the format (Italic, bold, and underline) you want as in figure (9- 16)

Figure 9-16:  
Font Format



**9-4-3 changing the Font Size:**

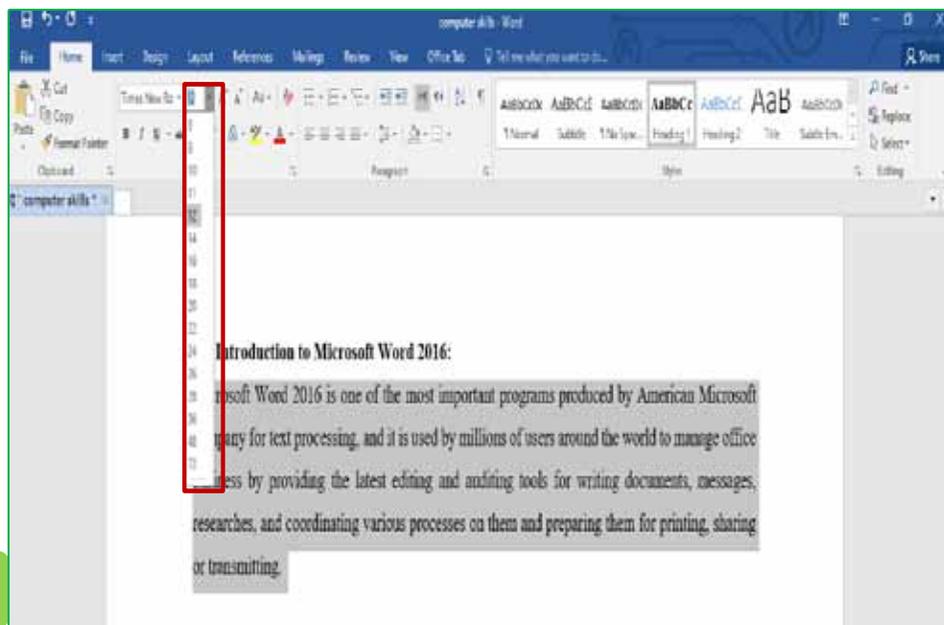
**Skill 9 - 15**

Changing the Font Size

**To change the font size, follow the following steps:**

1. Select the text you want to change the size of its font.
2. From the <Home page> tab and from the group <font> click on the <font size> icon arrow as in figure (9- 17)
3. Choose the appropriate size of the font and save the document.

Figure 9-17:  
Font Size



### 9- 4 -5 Change the FontType:

## Skill 9 - 16 Change the Font Type



**To change the font type, follow the following steps:**

1. Select the text you want to change the type of font.
2. From the <Home page> tab and from the group's <font> click on the icon arrow <Font type> as in figure(918-)
3. Choose the appropriate type of font and then save the document.

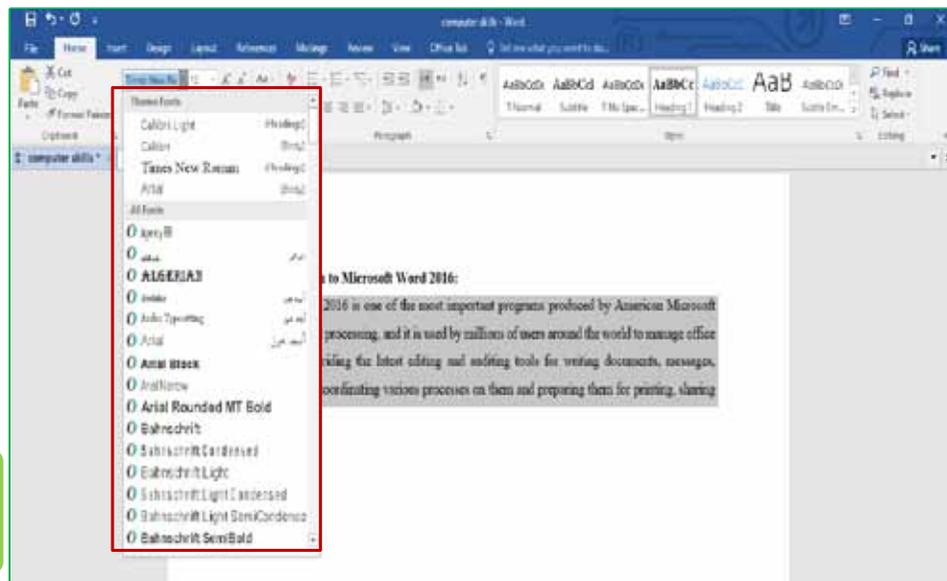


Figure 9-18:  
Font  
Types

### 9 -46- Change the Font Colour:

## Skill 9 - 17 Change the Font Color



**To change the colour of the font, follow the following steps:**

1. Select the text you want to change the colour of its font.
2. From the <Home page> tab and from the group <font> click on the <font Colour > icon arrow as in figure (919-)
3. Choose the suitable colour for the font and then save the document.

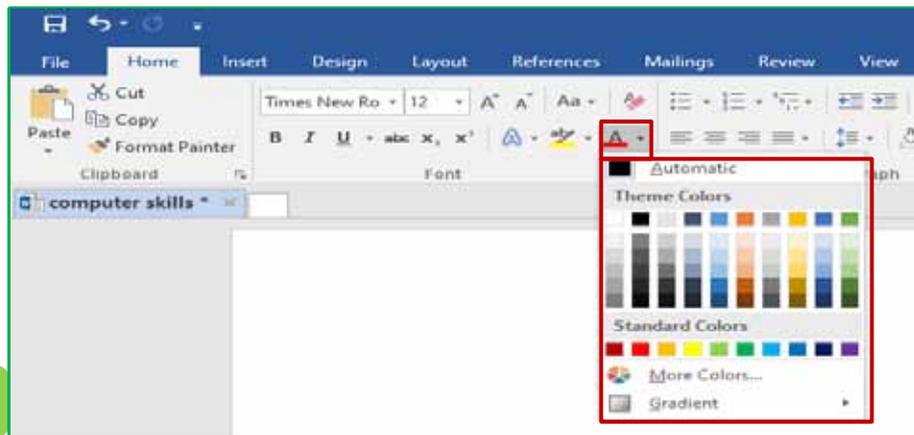


Figure 9-19:  
Font Colors

**9-4- 7 Text Highlight Colour:**

**Skill 9 - 18**  
Text Highlight Color



*In addition to the main font colours, you can also apply the highlight colour to the text. To apply a highlight colour to the text follows the following steps:*

1. Select the text on which you would like to add a colour to distinguish.
2. from the <Home page> tab and from the group's <font> click on the icon arrow <Text Highlight Colour> as the figure (9 -20)
3. Choose the suitable highlight colour for the text and then save the document.

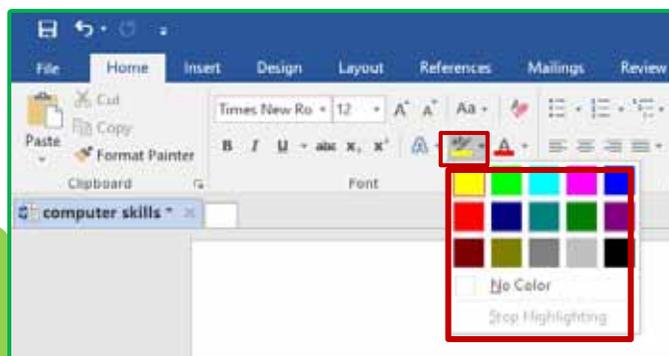


Figure 9-20:  
Text  
Highlight  
Color

**9-4- 8 Remove TextFormatting:**

**Skill 9 - 19**  
Remove text formatting



**To remove the text format, follow the following steps:**

1. Select the text from which you would like to remove the format.
2. from the <Home page> tab and from the <font> group click on the entire <remove Format> icon arrow as the figure (921-)
3. Save the document.

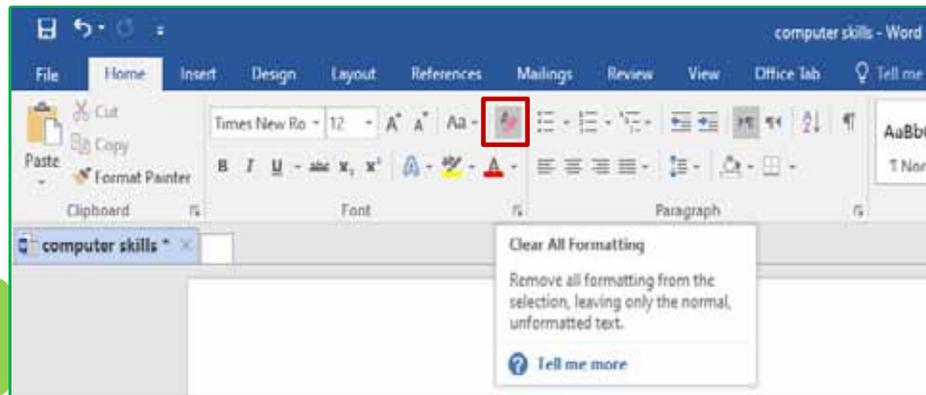


Figure 9-21:  
Clearing All  
Text Format

**9- 5 StyleProcess:**

**Skill 9 - 20**  
Using Ready made Style



The style is a set of formatting properties such as (font type, font size, font colour, line distance, alignment.... etc.) Styles are used to shorten time by applying many formatting properties at once.

**9- 5- 1 Using Existing Heading Style:**

**To apply ready-made letter style to a document follows the following steps:**

1. Open the document and then select the text on which you want to apply the letter style.
2. From the 'Home page' tab and from the group 'Styles', click on share more styles as in form (9- 22)
3. Click on the style you want and then save the document or keep it open.



Figure 9-22:  
Text Style  
Types and  
Options

**9 -5 - 2 Create a New Style:**

### Skill 9 - 21

## Create a New Style

**To create a new style follows the following steps:**

1. Open a document and then write a text in a specific style.
2. We select the text and then go to the 'Home page' tab go for the 'Styles' set click on 'Create a style'
3. A dialog box with options (style name and style preview) will appear as in figure (9- 23)
4. Click on OK to create style

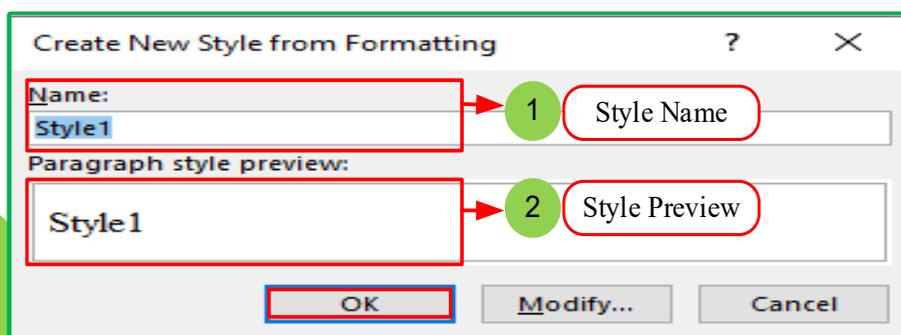


Figure 9-23:  
Creating a  
New Style

9-5-4 Change Styles Properties:

**Skill 9 - 22**  
**Change Styles Properties**



To change the properties of styles, follow the following steps:

1. From the 'Home page' tab and from the 'Styles' group click on the style we want to change its properties with the right button of the mouse and choose 'edit' as the figure (9 -24)

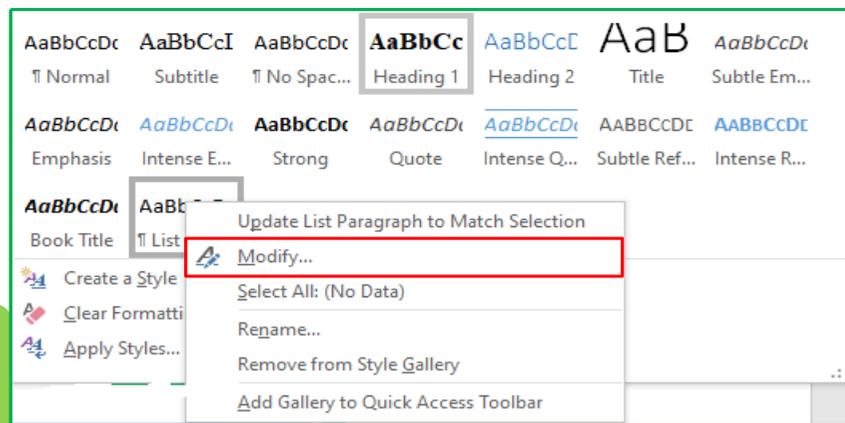


Figure 9-24:  
Modifying Existing Style

2. A dialogue box with a style adjustment will appear and has a range of options. Choose what suits you for adjustment as in figure (9- 25)

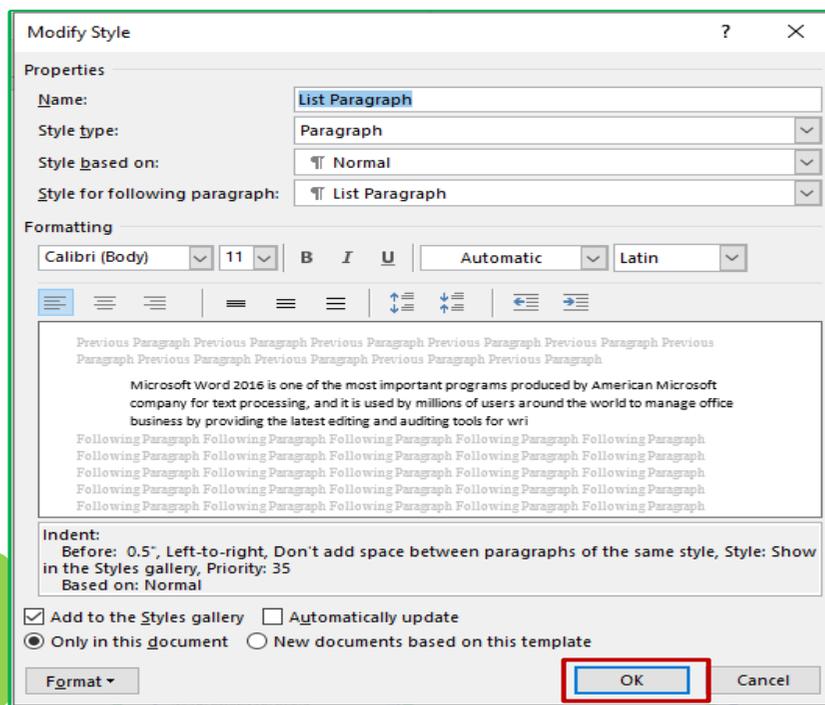


Figure 9-25:  
Modifying a Style Window

3. Click on 'OK' to change the style properties that have been selected

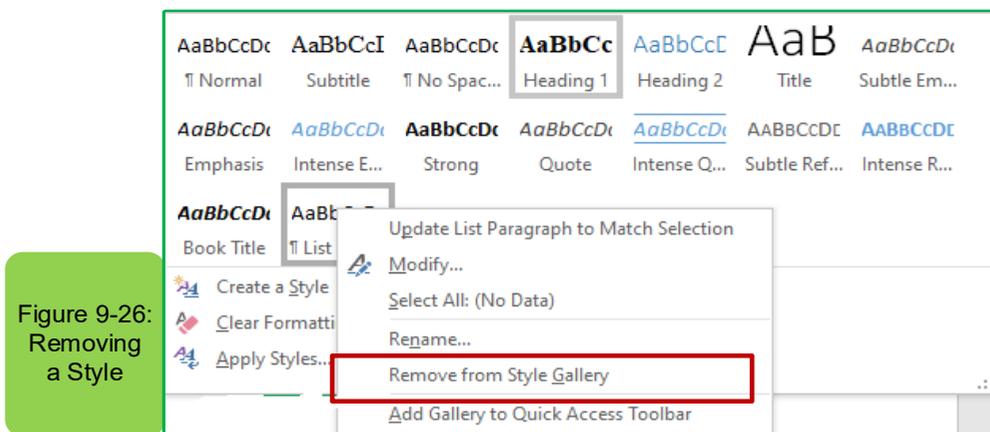
9- 5 -5 Delete a Style:

**Skill 9 - 23**  
Delete a Style



**To delete a style follow the following steps:**

1. Open the document from which you want to delete the style.
2. From the 'Home Page' tab and from the 'Styles' group, click on the style you would like to delete with the mouse right button and choose 'Remove from the style Gallery' as figure (9 -26)



9- 6 Document Management:

Word 2016 has some options that affect when applied to the entire page, including page direction and size, page margins, and other options.

9- 6 -1 Page Setup:

**Skill 9 - 24**  
Page Setup



**To setup the page Follow the following steps:**

1. Open the document you want to set up.
2. From the <Layout> tab and from the <Page Setting> tab click on one of the page setting options (adjust the margins, change direction, choose page size, add and remove columns, insert page breaks, show line numbers, change hyphen) as in figure (9- 27)
3. Click the <Save> button for the document to save the previous settings.

Figure 9-27:  
Page Setup



### 9 -6- 2 Insert Header and Footer:

**Skill 9 - 25**  
**Insert Header and Footer**



The header and footer of the page are the upper and lower parts of the margins of each page in the document where the data you want is written automatically at the top or bottom of the page in all pages of the document.

**To insert the header, footer, and page number follow the following steps:**

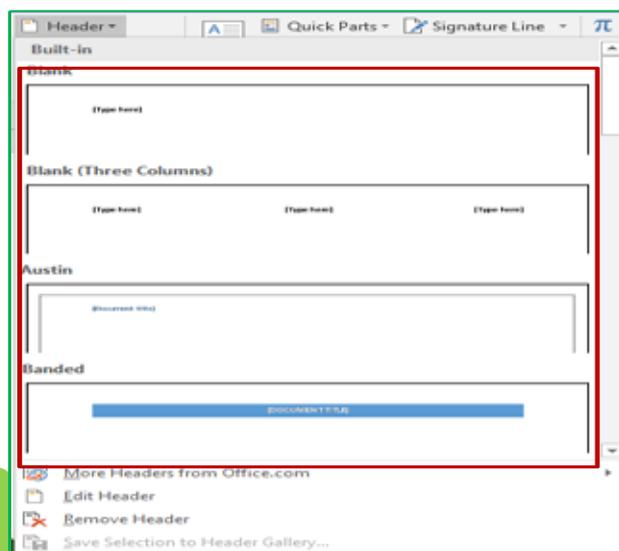
1. Open the document on which you would like to insert a header and footer to the page.
2. From the 'Insert' tab go to 'Header or footer' as form (9- 28)

Figure 9-28:  
Insert Page  
Header and  
Footer



3. Click on the header and the header dialog will appear as in figure (9- 29)

Figure 9-29:  
Insert Page  
Header  
Window



4. Choose from the header dialog box the appropriate type of page header that you want to add.

5. It will be automatically inserted into the document
6. The same steps can be followed to insert the page footer by clicking on the 'footer' option for the document as in figure (9- 30)

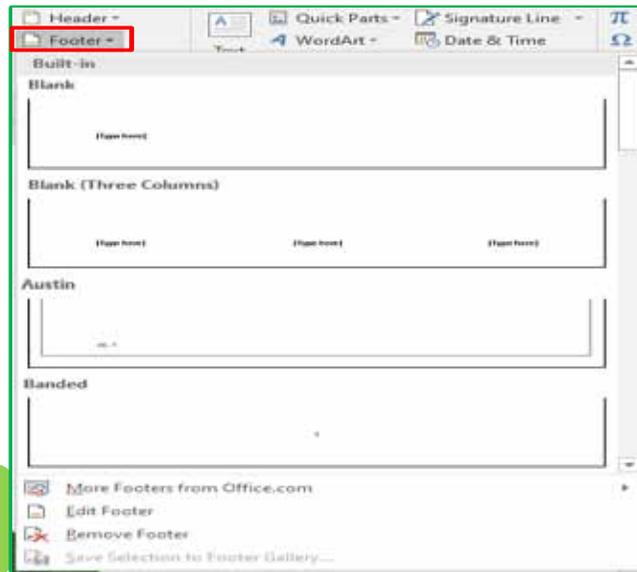


Figure 9-30:  
Insert Page  
Footer  
Window

**9 -6- 3 Edit the Header and Footer:**

**Skill 9 - 26**

Edit the Header and Footer

**To edit the header or footer of the page, follow the following steps:**

1. Double-click inside the <header/footer> area.
2. The <design> will appear from which to go to the <header and footer> set to edit the header and footer, for example if we want to change the date we will click on it and make the necessary adjustments See Figure (9 -31)

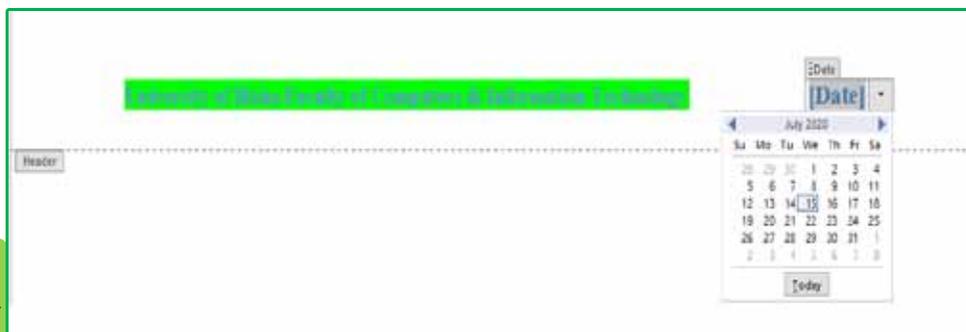


Figure 9-31:  
Editing the  
Page Header

3. Close this tab or double-click anywhere in the main part of the document.
4. Back to the normal editing view.

**9 -6- 4 Inserts Pages Numbers:**

**Skill 9 - 27**  
**Inserts Pages Numbers**



Page numbers are treated as a header and footer to the page because they are at the top of the page or at the bottom. Page numbers are formatted like any other text.

**To insert page numbers follow the following steps:**

1. From the <Insert> tab and from the <header and footer> group click on the add page numbers
2. Options will appear to insert the number at the front of the page or at the bottom of the page as in figure (9 -32)
3. Choose one of the appropriate formats to insert the page numbers of your document
4. Click on the page number command that will cause the numbering to appear on the page

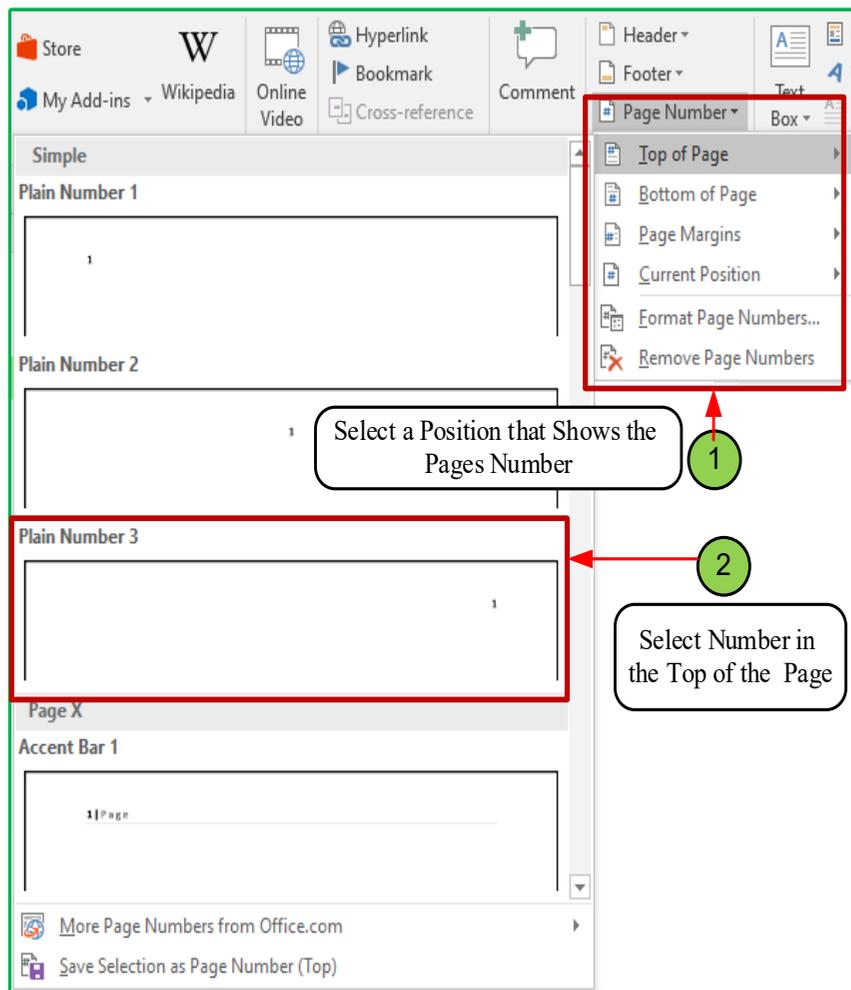


Figure 9-32:  
Insert  
Pages  
Number

**9- 6- 5 Delete Page Number:**

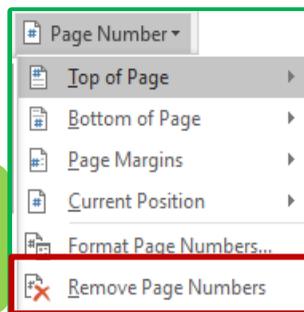
**Skill 9 - 28**  
Delete Page Number



**To delete page numbers, follow the following steps:**

1. From the <Insert> tab and from the <header and footer> group click on the page number arrow
2. Options will appear, Click option on the <Delete Page Numbers> as in figure (9- 33 )

Figure 9-33:  
Removing  
Page Numbers



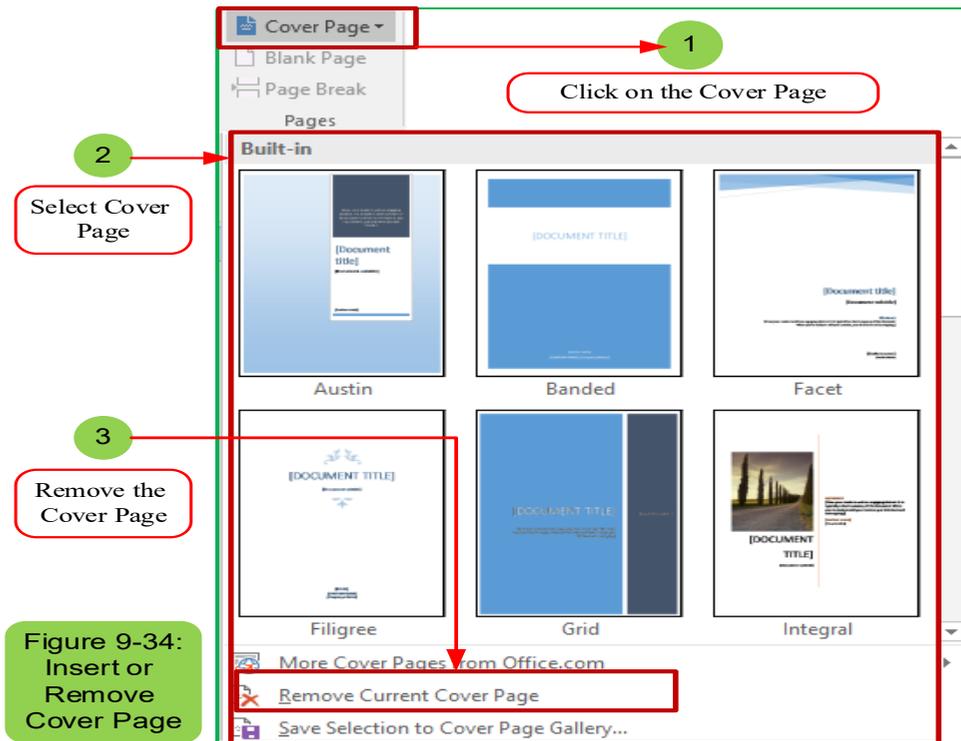
**96-6- Add and Delete a Cover Page:**

**Skill 9 - 29**  
Add and Delete a Cover Page



**To add a cover page, follow the following steps:**

1. From the 'Insert' tab and from the group 'pages, choose 'cover page'
2. Click on the cover page you want and this page will be included and you will be able to edit the typical text in your text.
3. To delete the cover page click 'Delete the cover page' see Figure (9 -34)



## 9 -7 Insert Images, Drawings, Tables, Shapes, Symbols and Equations:

### 9.7.1 Insert and Format Images:

#### •Insert an Image:

### Skill 9 - 30

### Insert an Image

*To insert a picture follow the following steps:*

1. From the 'Insert' tab and from the 'Illustrations' collection click on the 'Photos' icon as in figure (935-)



2. The 'Insert Image' window will appear
3. Select the track of the image on the computer
4. Choose the image you would like to insert by clicking on it with the left mouse button once

- Click on insert or click on the left mouse button double click in a row, the image will be inserted into the document see Figure (9- 36)

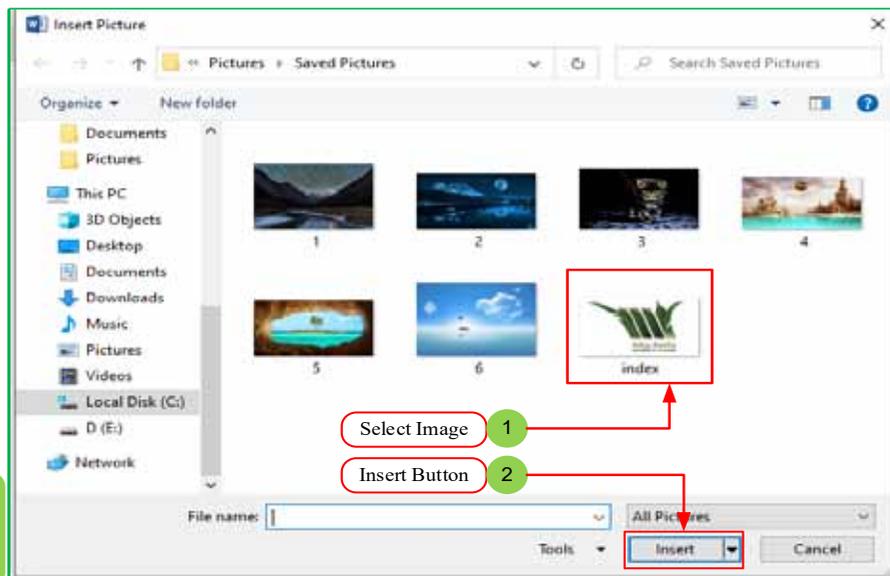


Figure 9-36:  
Insert Image  
Window

● **Image Resize:**

**Skill 9 - 31**  
**Image Resize**



*To resize the image follow the following steps:*

- Select the image to be resized by clicking on it with the left mouse button
- Circles will appear on the borders of the image
- Drag these circles out with the mouse to enlarge or to minimize the size of the image see figure (9- 37)



Figure 9-37:  
Changing  
Image Size

- **Image Format:**

**Skill 9 - 32**  
**Image Format**



**To format the image follow the following steps:**

1. Select the image to change its format by clicking on it with the left mouse button
2. A new tab will appear under the name 'Format'
3. Choose the appropriate tools to format the image see figure (938-)



Figure 9-38:  
Image  
Formatting

**The commands in the format tab allow:**

1. Remove the background: to control the parts of the image
2. Corrections: to improve image brightness and contrast
3. Colour: to change colour
4. Artistic Effects: To add effects on the image
5. Image compression: to reduce image size
6. Changing the image: change to another image
7. Reset image: to ignore all formatting changes

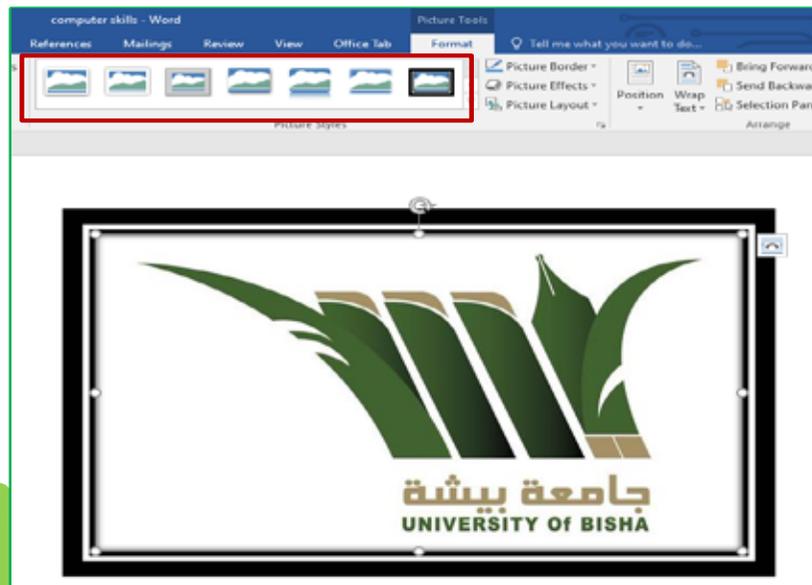


Figure 9-38:  
Image  
Formatting

● **Insert Pictures from the Internet:**

**Skill 9 - 33**  
Insert Pictures from the Internet



**To insert a picture from the Internet follow the following steps:**

1. Place the mouse indicator where you want to insert the image
2. From the 'Insert' tab and from the group 'Illustrations', click the left mouse button on the icon 'Online Photos' as in figure (939-), and an Internet connection must be available.

Figure 9-39:  
Insert  
Pictures from  
the Internet



3. The 'Picture Insert' screen will appear, type the name of the image or clip what you want to search for
4. Search results will appear from them choose the desired image and then click on the 'Insert' button and the image will appear where it was pre-set in step 1

**9-7-2 Insert and Delete Shapes:**

**Skill 9 - 34**  
**Insert Shapes**



**To insert and delete shapes follow the following steps:**

1. From the 'Insert' tab click the left mouse button on 'shapes' as in figure (9- 40)

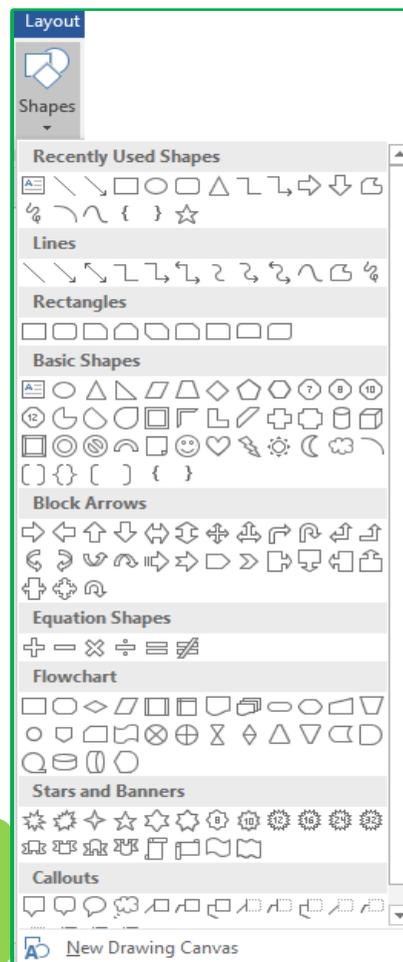


Figure 9-40:  
Insert  
Shapes

2. Select the required shape from the set of shapes by clicking on it with the left mouse button
3. Select what you want to insert the shape and then continuously click the left mouse button to start the insertion process with the indicator pulled in the desired direction as in figure (9- 41)
4. Control the shape resize in the same way you used to change the size of the image above.

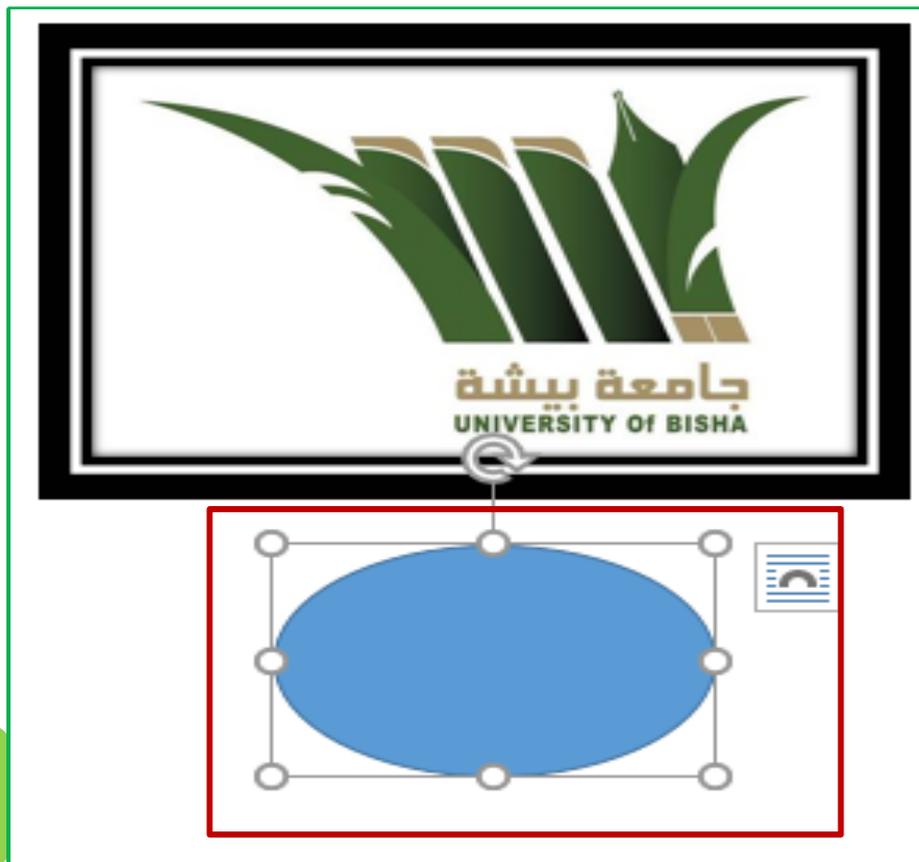


Figure 9-41:  
Changing  
Shape Size

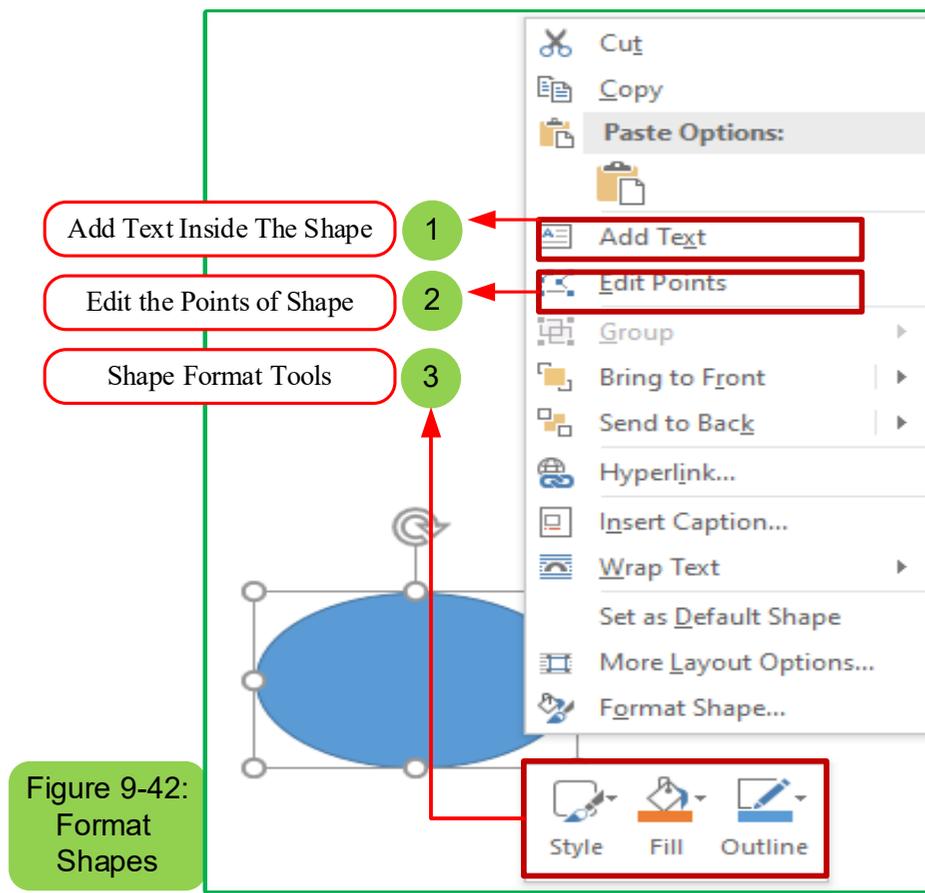
● **Format Shapes:**

**Skill 9 - 35**  
Format Shapes



*To format shapes, follow the following steps:*

1. Select the shape to be formatted by clicking on the left mouse button
2. A new tab will appear as 'Format' click on it and then select the appropriate tools to format the shape such as:
  - Shape style
  - Fill the shape
  - Outline of the shape
  - Effects of shapes
3. To add text inside the shape click the right mouse button on the shape and then click 'Edit the dots' to add text or to edit text points click see Figure (9 -42)



- **Insert Video from Internet:**

**Skill 9 - 36**  
Insert Video from Internet



**To insert a video from the Internet follow the following steps:**

1. Place the mouse indicator where you want to insert the video
2. From the 'Insert' click on the 'Online Video' icon
3. The video insert window will appear, write the name of the video you are looking for and you want to upload it within the document, for example we would like to search for a video in the name of the prophet's biography from YouTube
4. Search results will show the desired video and click on the 'Insert' button see Figure (9 -43)

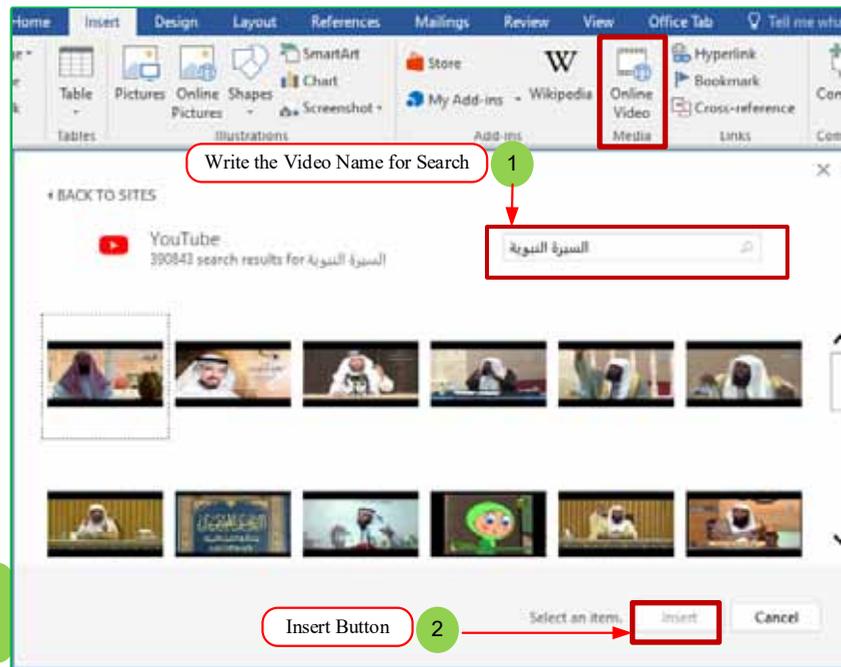


Figure 9-43:  
Insert Video  
Wondow

### 9 -7 -3 Insert and Use Word Art and Smart Art:

- **Insert Word Art:**

## Skill 9 - 37

### Insert Word Art

Uses Word Art to add document-specific text effects

**To insert a Word Art font, follow the following steps:**

1. Place the mouse pointer on the text you want to add the Word Art effect.
2. From the 'Insert' tab click left mouse button on Word Art
3. Word Art options appear as in figure (9- 44)

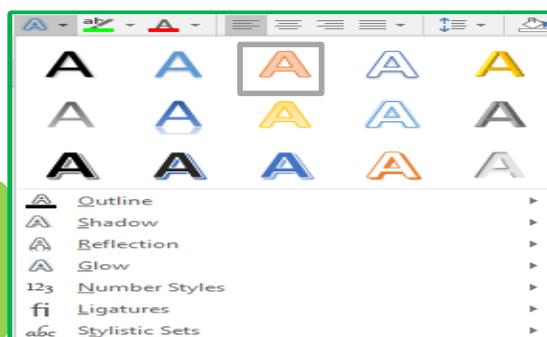


Figure 9-44:  
Inserting a  
Word Art  
Text

4. Choose the effects of Word Art and the effect will appear on the text see Figure (9 -45)

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Figure 9-45:  
Word Art  
Text Effect

5. Word Art style can be chosen first and then we write the text and the Word Art effect will appear on the entered text

- **Insert Smart Art:**

**Skill 9 - 38**  
Insert Smart Art



**To insert the Smart Art chart, follow the following steps:**

1. Place the mouse indicator on the text you want to add the Smart Art effect
2. From the 'Insert' tab, click the left mouse button on 'SmartArt'
3. Smart Art Graphic Options screen will appear
4. Choose the Smart Art drawing that is appropriate for you and then click 'OK' see Figure (946-)

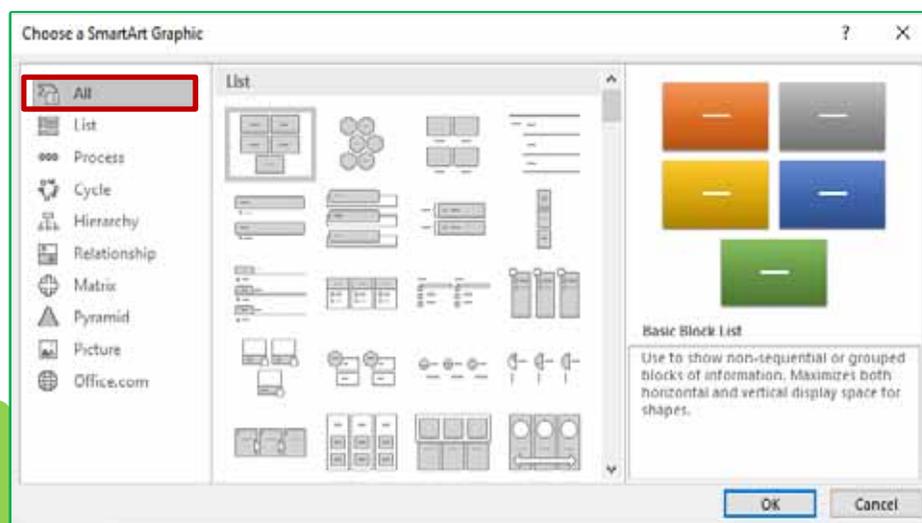


Figure 9-46:  
Insert Smart  
Art Shape  
Options

9- 7 -4 Inserts a Chart:

**Skill 9 - 39**  
Insert a Chart



Word 2016 adopts new types of charts that help display data in ways that the user can understand and compare, the most important of which are (vertical, tape, linear, circular)

**To insert a chart follow the following steps:**

1. Place the mouse indicator in the text that you want to insert a chart on it
2. From the 'Insert' tab and from the 'Illustrations' collection, choose a 'chart' icon
3. The dialogue box will appear (insert 'chart')
4. Click with the left mouse button in the shape of the chart you want to insert and then click on 'OK' see Figure (9- 47)

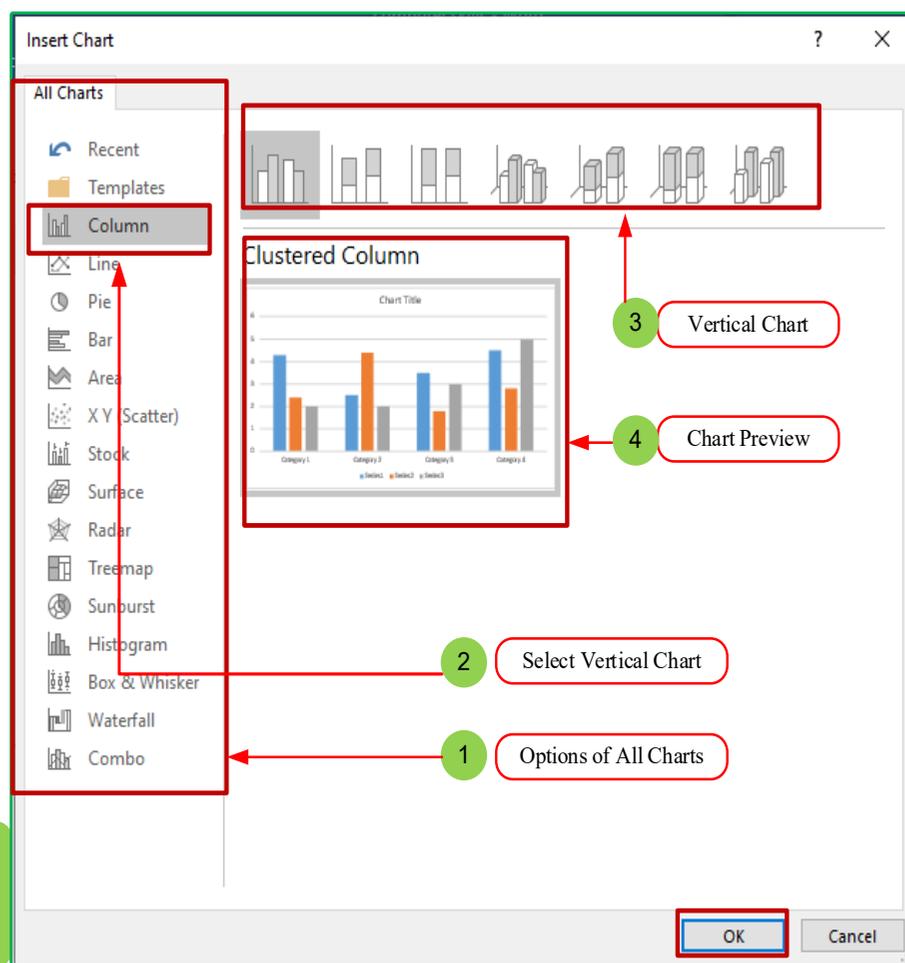


Figure 9-47:  
Inserting  
Chart

**9-7-5 Insert and Format Tables:**  
**9.7.5.1 Table Insertion:**

**Skill 9 - 40**  
**Table Insertion**



Tables are a good way to organize information with documents, and Word2016 allows you to add a table within the document and format it as necessary. To insert a table within the document follow the following steps:

1. Place the mouse indicator where you want to insert a table
2. From the <Insert> tab click the table option, drag the table dimensions on the grid and click the left mouse button see figure (948-)

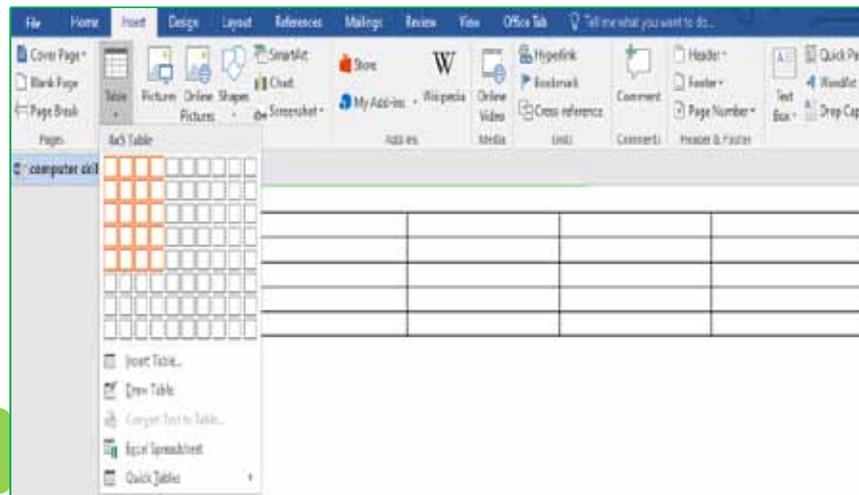
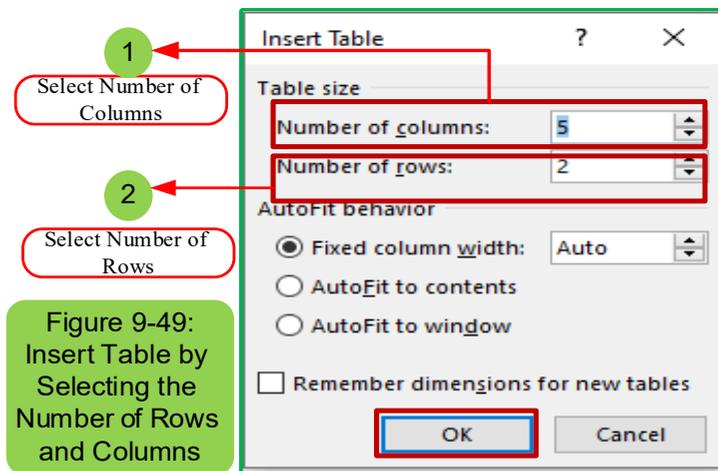


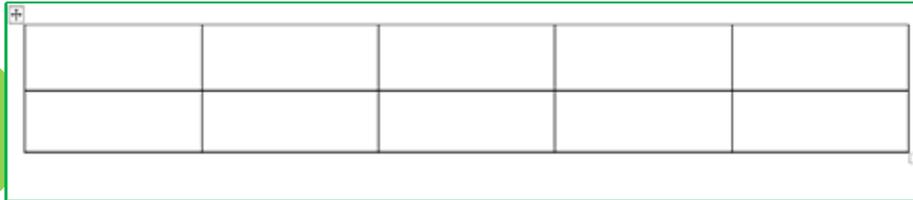
Figure 9-48:  
Insert Table

3. Or a table can be also inserted in a 'table insert' way
4. The 'Insert Table' dialog will appear and select the required columns and rows in the table see Figure 9- 49.



- Click on the 'OK' button, the table will appear in the document as the figure (9- 50)

Figure 9-50:  
Table  
Inserted



● **92-5-7- Table Format:**

**Skill 9 - 41**

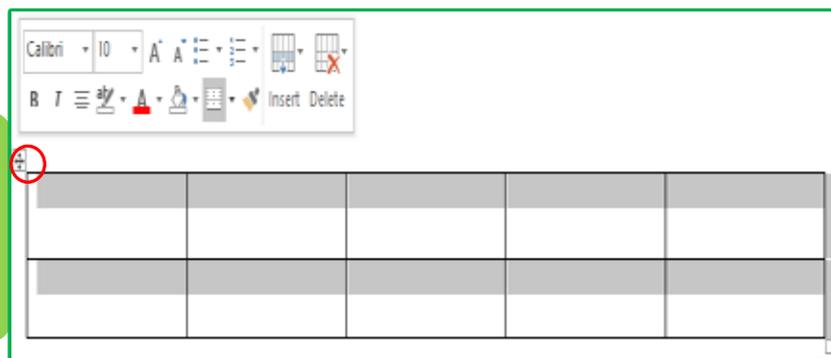
**Table Format**



You must select the cells you want to format, and to select table cells, follow the following steps:

- Place the mouse indicator over any part of the table and click the four-headed arrow icon over the upper corner of the table as in figure (9- 51)

Figure 9-51:  
Table  
Prosperities  
using the  
Headed  
Arrow



- From the 'Home page' tab choose font type, size, colour, cell fill colour, text alignment (right, left, centre)
- Control the height of the rows and the width of the columns by pulling the mouse button.
- The previously selected format will be applied to the schedule.

**93-5-7-Use Automatic Formattingfor the Table:**

**To use the automatic formatting to the table, follow the following steps:**

1. Select the table in the box by clicking on the four-headed arrow icon above the upper corner from the right of the table

2. from the <Design> tab go to the <Normal Table> option and the format window appears as figure (952-) and from which to choose the appropriate format.

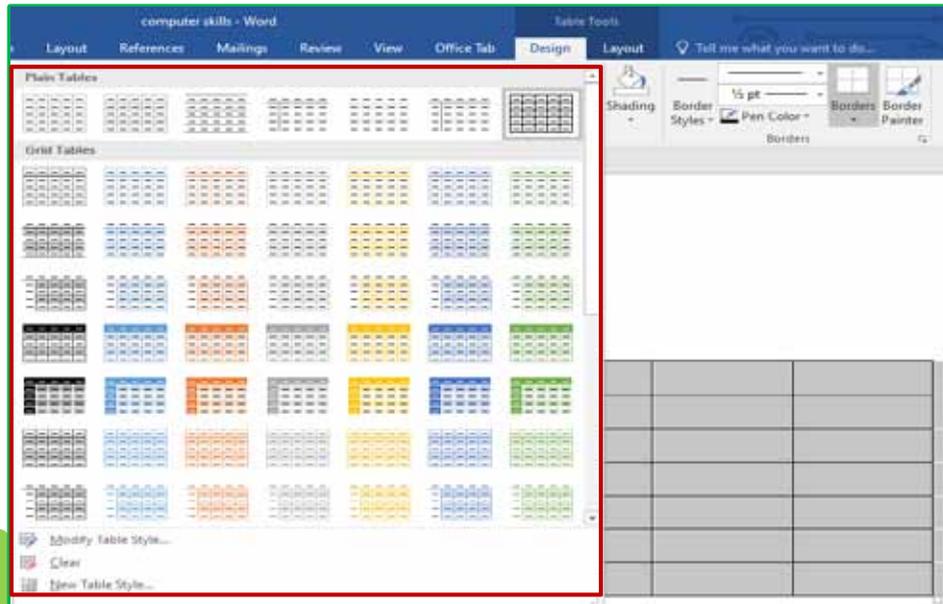


Figure 9-52:  
Table Format

3. Once you have chosen a format you will notice it applied to the table

#### **9-7-5-4 Inserts Rows and Colum in the Table:**

### **Skill 9 - 42** Inserts Rows and Colum in the Table



***To insert rows and Column to the table, follow the following steps:***

1. Select the row you want to insert above, bottom, right, or left of it
2. Place the writing indicator in any cell of the row
3. Go to the 'Layout' tab and from the 'Rows and Columns' group click the icon 'Insert' with insert options (up to the bottom right left) as in figure (9- 53)

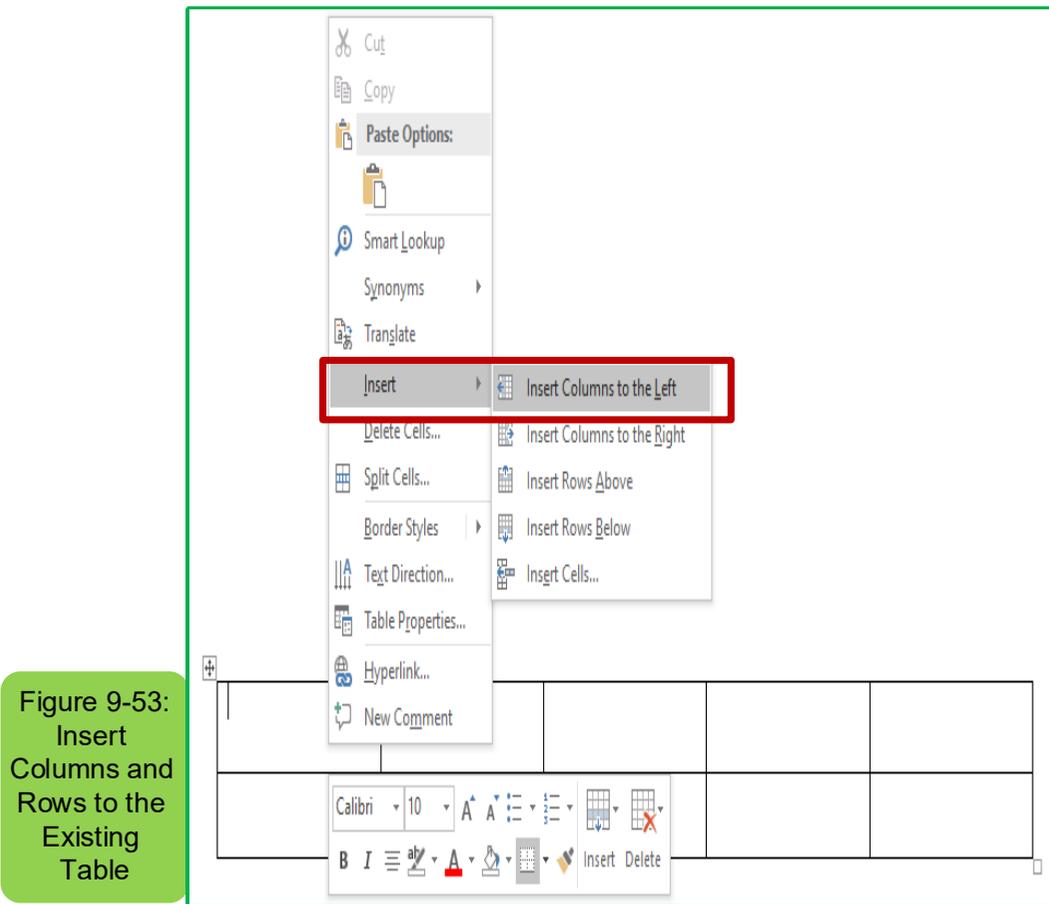


Figure 9-53:  
Insert  
Columns and  
Rows to the  
Existing  
Table

● 9 -7 -5 -5 Add Borders and Shading to the Table:

**Skill 9 - 43**  
Add Borders and Shading to the Table



**To add borders and shading to the table, follow the following steps:**

1. Place the mouse pointer in any of the table cells
2. From ‹Design› select Page borders tab
3. The ‹Borders and Shading› window will show which choose ‹borders›
4. Choose the border shape of border options from the right of the border window and shading (without, surround, all, grid, custom)
5. Choose the style or shape of the border from the centre of the border window and shading
6. Choose the colour of the border from the centre of the border window and shading

- Choose the width of the border from the centre of the border window and shading and you will notice the preview to the left of the border window and shading see figure (9- 54)

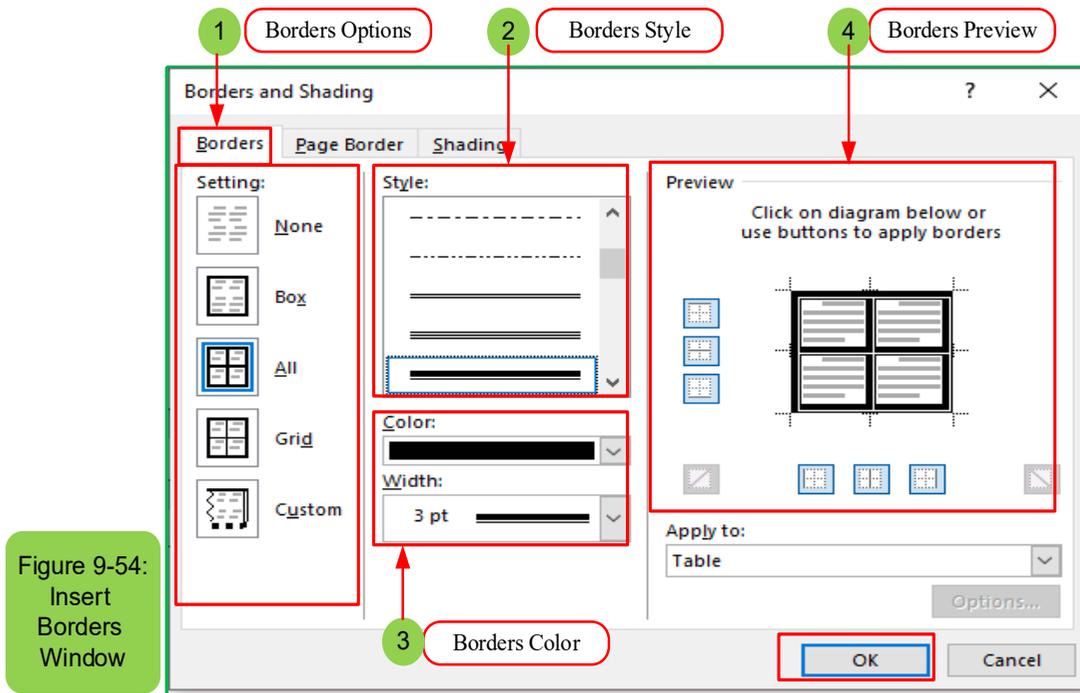


Figure 9-54:  
Insert  
Borders  
Window

- Click 'OK' at the bottom of the border and shading window and the table will appear with the borders and specifications chosen see Figure (9- 55)

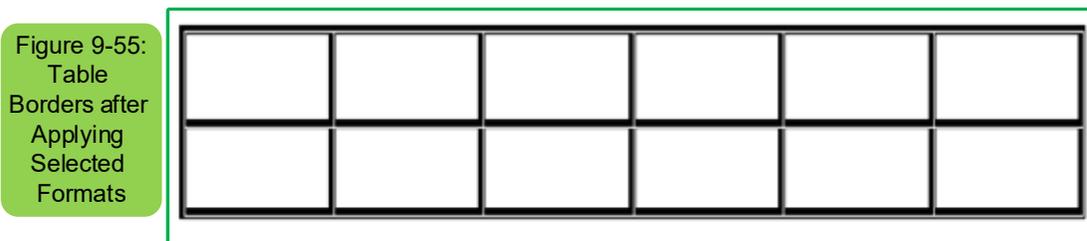


Figure 9-55:  
Table  
Borders after  
Applying  
Selected  
Formats

### 9-7-5-6 Add Shading to the Table:

**To add shading to the table follow the following steps:**

- Click on the <Shading> tab from the border window and shading
- Choose the shade colour you want
- Choose the shade style from the bottom of the border window and shading.
- Click OK at the bottom of the border window and shading see figure (956-)

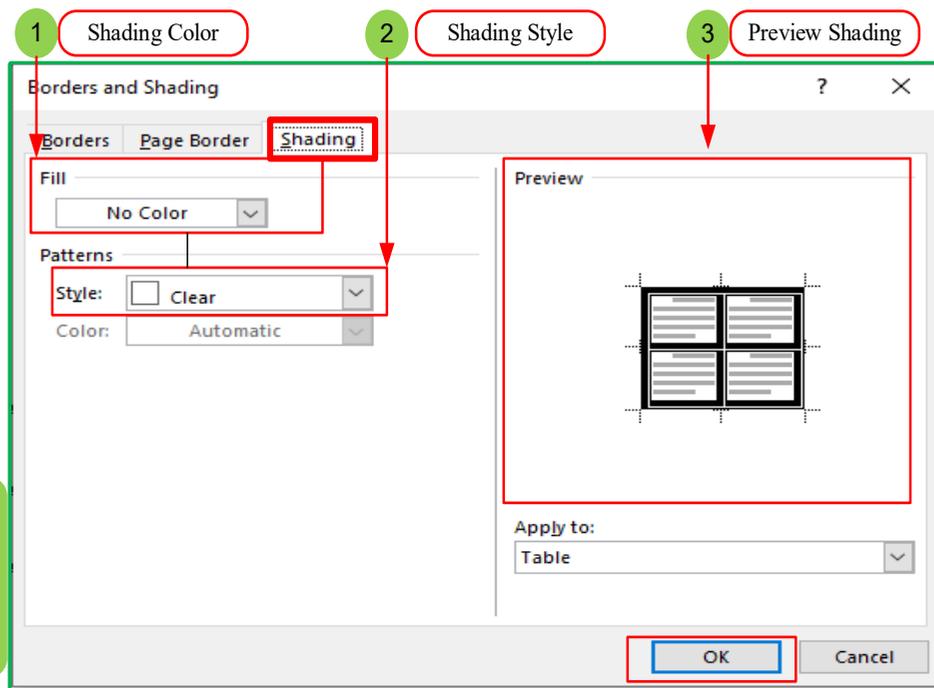


Figure 9-56:  
Insert  
Shading  
Window

5. The table will appear directly in selected formats as in figure (9 -57)

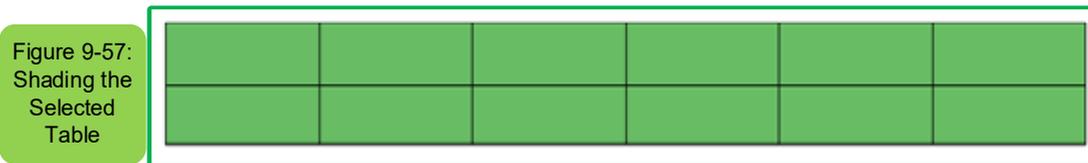


Figure 9-57:  
Shading the  
Selected  
Table

**9 -7- 6 Inserting Symbols and Equations:**

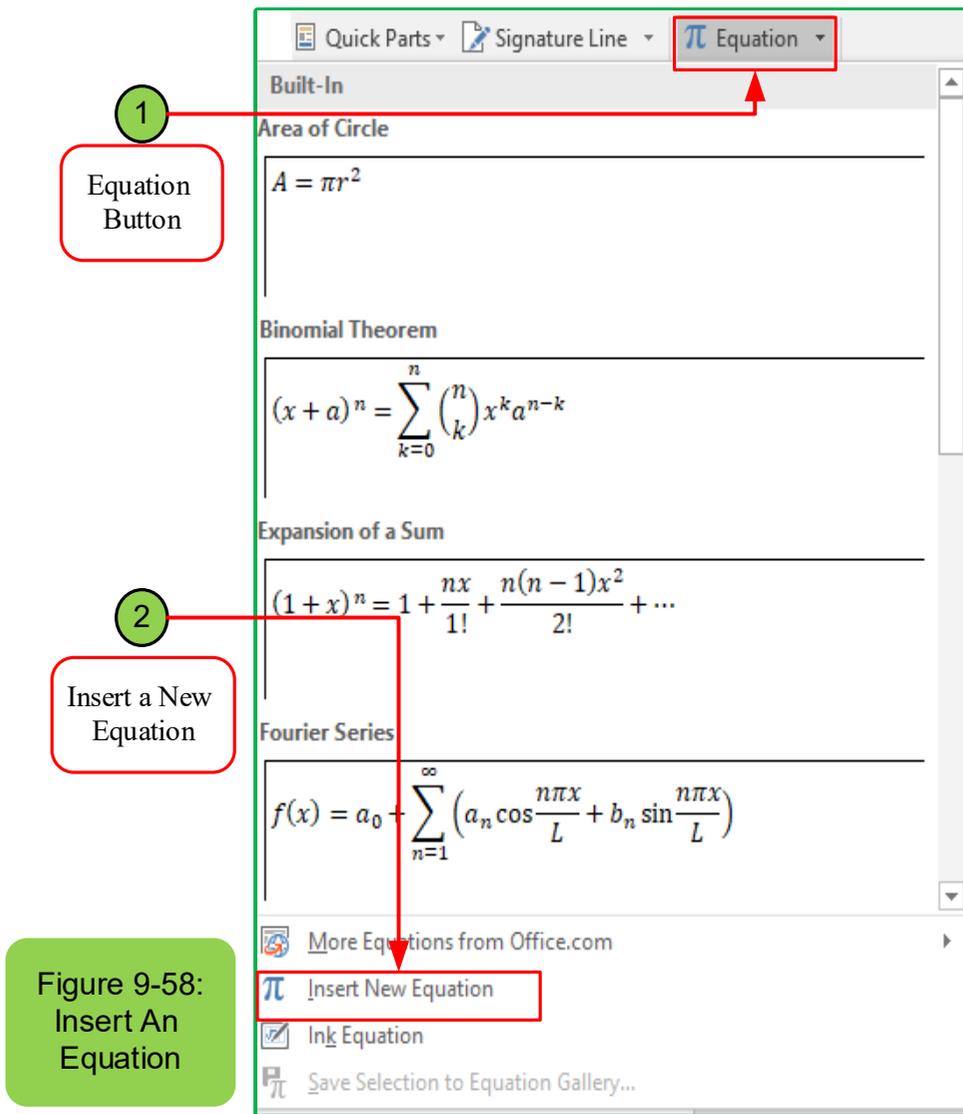
Word 2016 allows you to insert mathematical symbols in the form of equations or texts using equation tools

**9- 7- 9- 1 InsertsEquation:**

**Skill 9 - 44**  
Inserts Equation

**To insert an equation, follow the following steps:**

1. Place the indicator where you want to insert the equation
2. From the Insert tab and from the 'symbols' group click the arrow in the equation,
3. Click 'Insert a new equation' see Figure (958-)



**9-7-6-2 Insert Symbol:**

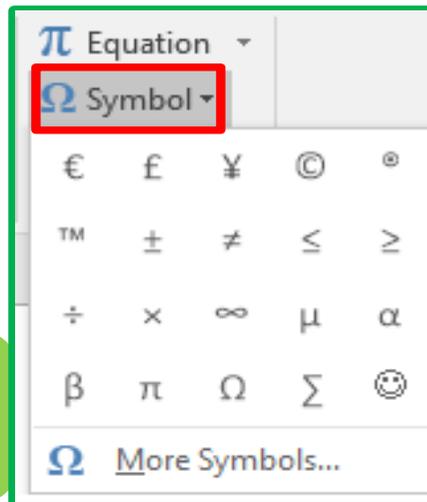
**Skill 9 - 45**  
**Insert Symbol**



**To insert a symbol, follow the following steps:**

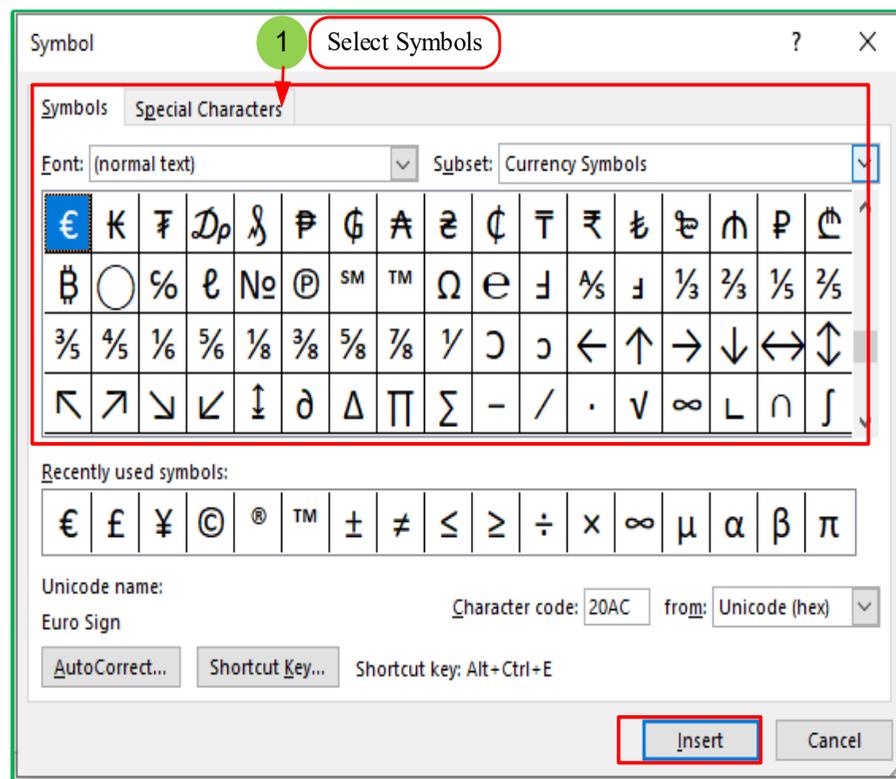
1. Place the cursor where you want to insert the symbol
2. In the 'Insert' tab click on 'symbol' as in figure (959-)

Figure 9-59:  
Inserting  
Symbols



3. Click 'More symbols' to show the rest of the symbols when you find the symbol you want, click on 'Insert' or double-click the left mouse button above it and it will be inserted directly into the document See Figure (9- 60)

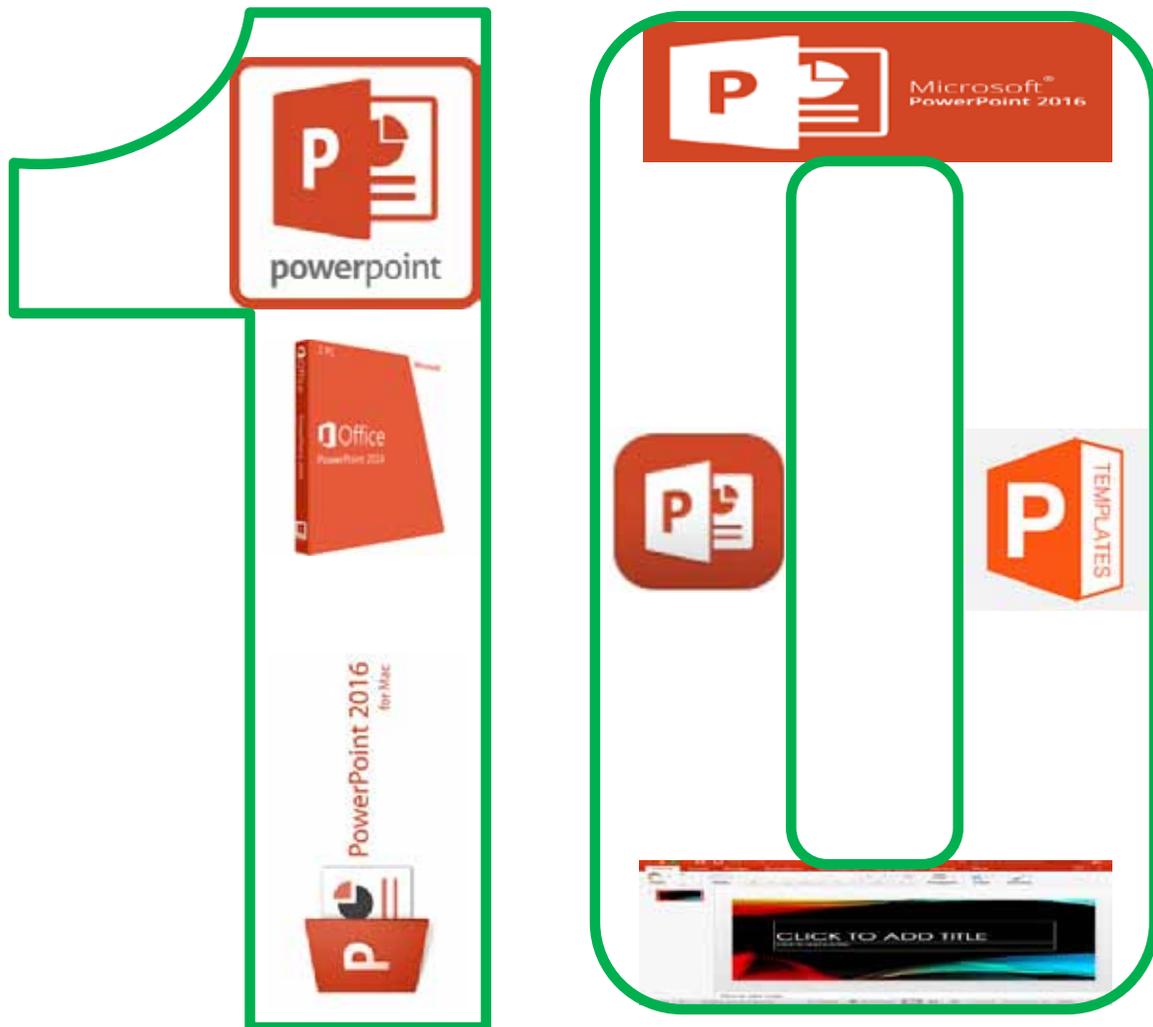
Figure 9-60:  
Additional  
Symbols  
Window





# Chapter 10

## Microsoft PowerPoint







## Microsoft PowerPoint

### Objectives

#### ➔ Main objectives:

1. The ability to create and edit slides.
2. The ability to insert and modify simple and large graphics.
3. Add sounds and animations to the slides.

#### ➔ Secondary objectives

After studying this chapter, the student is expected to master the following knowledge and skills:

1. Master the running and closing of PowerPoint program.
2. Learn how to open and close a presentation
3. Adds and deletes a slide.
4. Learn about changing slides within presentations.
5. Learn to add objects on a slide.
6. Learn to add and edit slides wallpapers.
7. Arrange and edit slides.
8. Learn to draw and insert shapes and graphs on slides.
9. Learn to add photos, sounds, and video to the slide.



## 10 -1 Introduction

In this chapter, we will review number of skills that student can be able to learn by using Microsoft PowerPoint 2016 or what is known as the PowerPoint Program. All these skills are only related to Microsoft PowerPoint 2016 so that we avoid repetition:

- What is Microsoft PowerPoint?
- New features in the PowerPoint program.
- The ability to deal with the interface of the power point program through which you can create, open, or close the program.
- Dealing with the power point program using slides or layout.
- How to create a presentation and the ability to add, edit or delete slides.
- Use parts that enable us to insert content into slides.
- Changing slides of the presentation.
- Choose and reset the layout of the slide.
- The ability to open, close and save files.
- The ability to obtain commands in the program of presentations through the command and instructions screen.

## 10- 2 Features included in the new version of Office 2016

- The new version provides us with the ability to share in writing and edit the file at the same time, which is one of the advantages of working on the same file at the same time with colleagues, so colleagues can edit the same file if it is saved in SharePoint at the same time, which is advantage enables group writing and the ability to participate in document output.
- The ability to send files of large sizes using cloud storage (OneDrive), which is an important feature that enables the user to save huge files in the cloud storage service by sending Url of the file using (Outlook) as well as modifying the files inside the storage location.
- Recovering files that were indeliberately deleted, and this file is saved in SharePoint or OneDrive Here deleted files can be recovered by going back to previous versions of Office.
- The smart search and replace feature, which is one of the most wonderful features of Office 2016. Through this feature, a specific word can be located inside the document by right-click to search for the word through the Bing search engine. This feature is useful in facilitating the editing and addition process as it also helps to replace written words with another.

- We find that there is the Groups feature in Outlook and it is a new feature that was added in the new version of Office. Now it is possible to create new lists include friends and colleagues with customizing for each group an incoming and sent email as well as calendar and OneNote.
- A new set of graphs, longitudinal and horizontal squares has been added in the new version, which is more flexible and sophisticated than previous versions that were difficult to use.
- The possibility of predicting the probable results and this feature is called a predictive text, which is a possibility was included in the charts in Excel, characterized by the speed of predicting the results and extracting the predictions by just pressing the mouse button, and it was designed specifically for employers to give reliable calculated results.
- Using Skype, which is an important feature for businessmen, as it enables them to use Skype within Word or Excel, now, video calls or messages can be answered without leaving the document that is being worked on.
- Finally, Office 2016 is interconnected with all systems. It is compatible with the Windows and Mac operating systems as well as with Android and OS.

### 10- 3 PowerPoint Program

The powerpoint Program or what is known as the Microsoft Power Point is considered one of the programs available at Microsoft Office and Power Point is specialized in creating presentations, as it provides many features that make the process of creating and presenting presentations easy. Microsoft PowerPoint 2016 is the version number fifteen for Microsoft. It is considered one of the effective programs in presentations (interactive presentations), whereby it is possible to create slides that appear sequentially, automatically, or interactively, with the addition of animations and sound effects accompanying the animation. The power point program enables its user to:

- Share files with others.
- Store file with PowerPoint format that is modifiable, or an automatic presentation that can be played without a PowerPoint program on the computer or in form of video.
- easy handling of charts and faster.

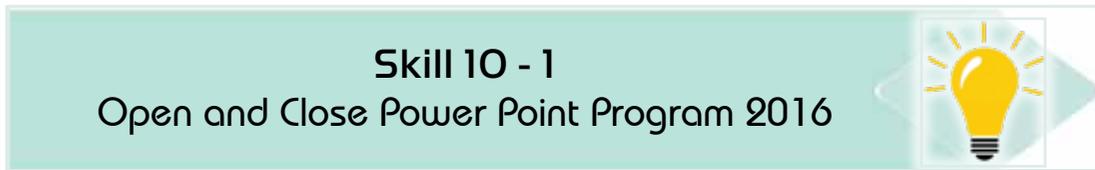
#### 10 -3- 1 Fundamentals of design using PowerPoint

*PowerPoint depends in its use on the fundamentals of which you must:*

- The user should focus on coordination with the required form.

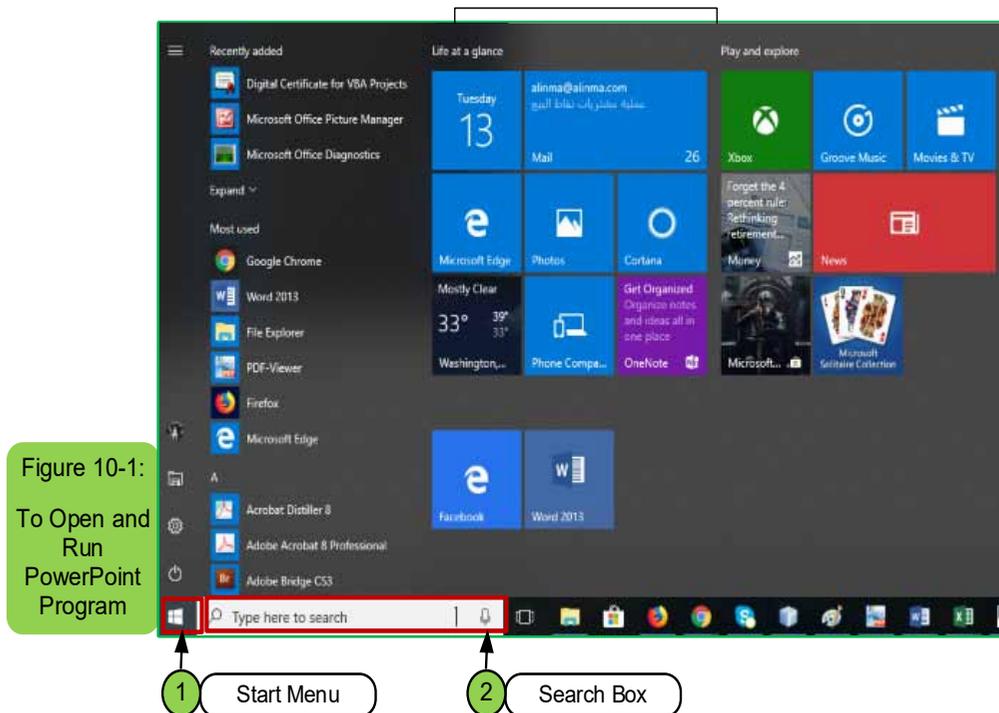
- The user should focus on using small sentences.
- The subtitles are distinguished by different colors and fonts, focusing on not using multiple fonts in one display, and focusing on using colors according to the degree of event and excitement.

### 10 -3- 2 Open and Close Power Point Program 2016



*To open and operate the PowerPoint program, there are several methods that can be used, such as:*

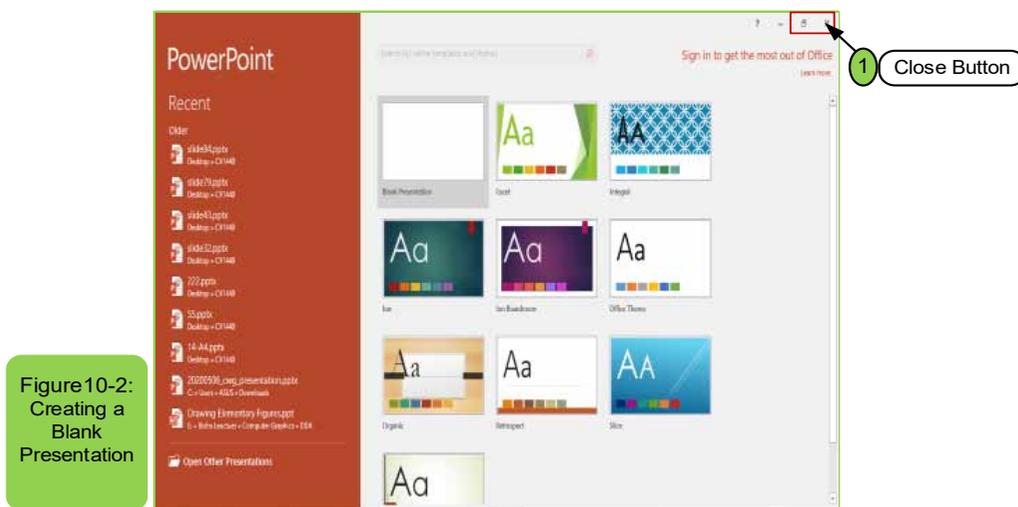
1. From the Start menu in Windows 10, click the left mouse button on the Windows icon, as shown in Figure 10 -1.
  - Then move to all programs.
  - Then enter the application programs and search for the PowerPoint 2016 program
2. Or directly, type in the search box as in Figure 101- Microsoft PowerPoint and then click the mouse button to open the PowerPoint program.



- Or from the desktop, by pressing the right mouse button on a place free of the desktop, then selecting New, then Microsoft PowerPoint presentation.

After entering Microsoft PowerPoint, the main options window will appear, as in Figure 10 -2, where we can:

- Create a blank presentation.
- Or use an existing presentation.
- Or use a ready-made presentation as a template.



- To close the PowerPoint program, click the left mouse button on the "X" icon located at the top left of the open window, which closes the file or by using the close button in keyboard (Alt + f4).

#### 10- 4 Interacting with PowerPoint using templates

**Skill 10 - 2**  
Creat New Template or Using Existing Template

We mean with templates in the powerpoint program, files that have already been prepared, and on using this template the program will make a copy. In case of the need to save this template, it will request a new name for the file to save it with this name without causing a change in the main name. There are many templates in the PowerPoint program, and some templates can be downloaded from the Internet. You can also create new templates of your own and with all the formats you want to use it later without having to do formatting again. To be able to create a new template or an existing template, you must use an existing template or file by following these steps:

- From the main options screen of the PowerPoint program, we choose one of the existing templates, or we write the name of the template in a search box about the related templates and themes at the top of the screen, according to the arrow indicated as in Figure 10 -3.

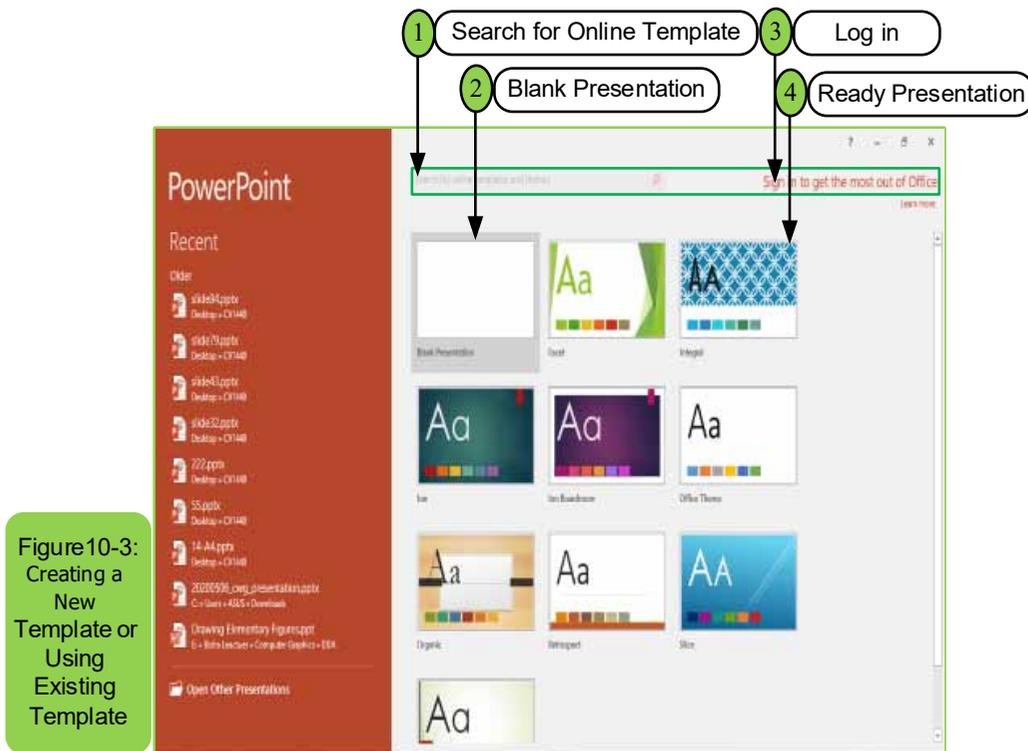
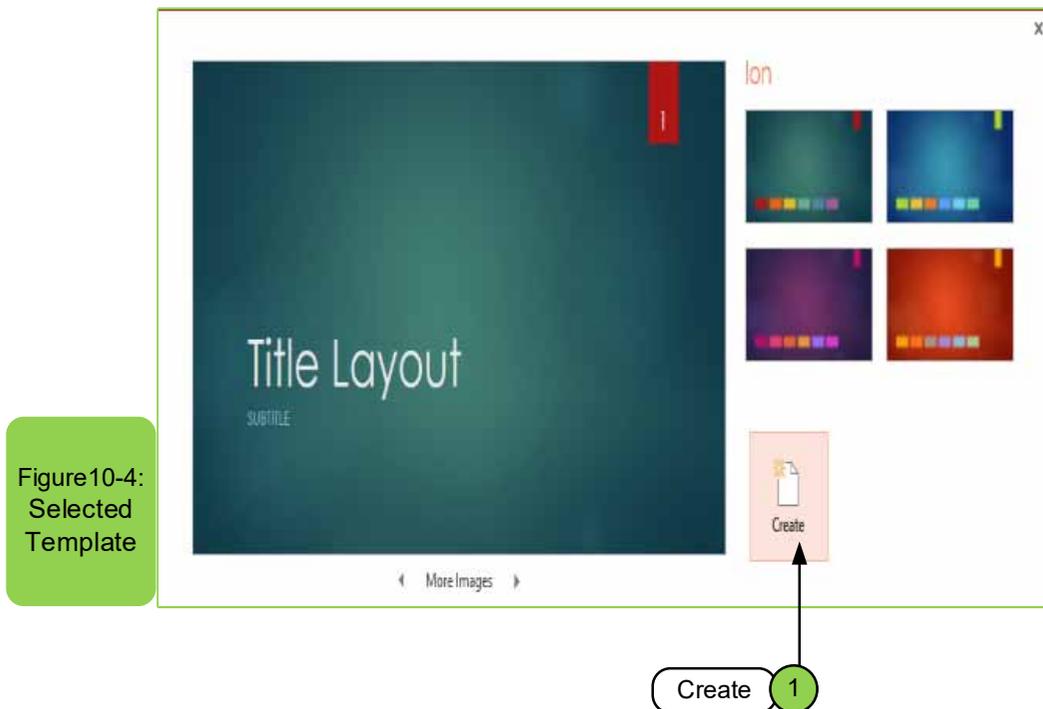


Figure 10-3:  
Creating a  
New  
Template or  
Using  
Existing  
Template

1. **Search box of Templates:** Helps in searching for existing ready-made templates. Or if you know the name of the template and it does not appear in the available templates on the screen, you can type the name and then press the enter key.
  2. **Blank presentation:** This means that it will open a blank slide without formats and the user can perform the format that he wants to add.
  3. **Ready Presentation:** It allows to use one of the ready presentations available within the PowerPoint program.
  4. **Log in:** if you have a Microsoft account to see what is new.
- Once you click on any of the mentioned templates, a set of pre-prepared templates will be shown, and you can choose any of them as needed.

Selecting the template is done by clicking on it with the left mouse button once. A window will appear containing information about the selected template. We can also move from one template to another through the templates in front of you. Once you choose one of the templates, you will see several options for the template itself and we choose what we want by clicking Create as in Figure 10 -4.



Option (1) allows us to create a template from pre-existing templates by clicking on the “Create” option. By clicking on it, the main window of the program will appear to us.

### **How to save the presentation**

*To save a PowerPoint file, there are several ways in which the file can be saved and they are:*

A- Go to:

- File menu in the main window
- Choosing the "Save" or "Save As" command, sometimes we find a difference between the two options. The "Save" option is used when saving a new file for the first time or an updated file. Either the "Save as" option is used in the case of saving the file for the first time, or in the case of a file that has a previous name and we want to keep another copy with a different name.

B- You can press Ctrl + S on the keyboard at the same time.

C- The power point program also allows us to save to old versions, or directly as a PDF file.

## 10-5 The main Interface (Window) of the User

**Skill 10 - 3**  
**Dealing with The Main Window (Interface) of the Microsoft PowerPoint Program**



When you choose the option “blank presentation” in Microsoft PowerPoint 2016, the main user interface for this program appears, as shown in Figure 10 -5, which contains several tabs.

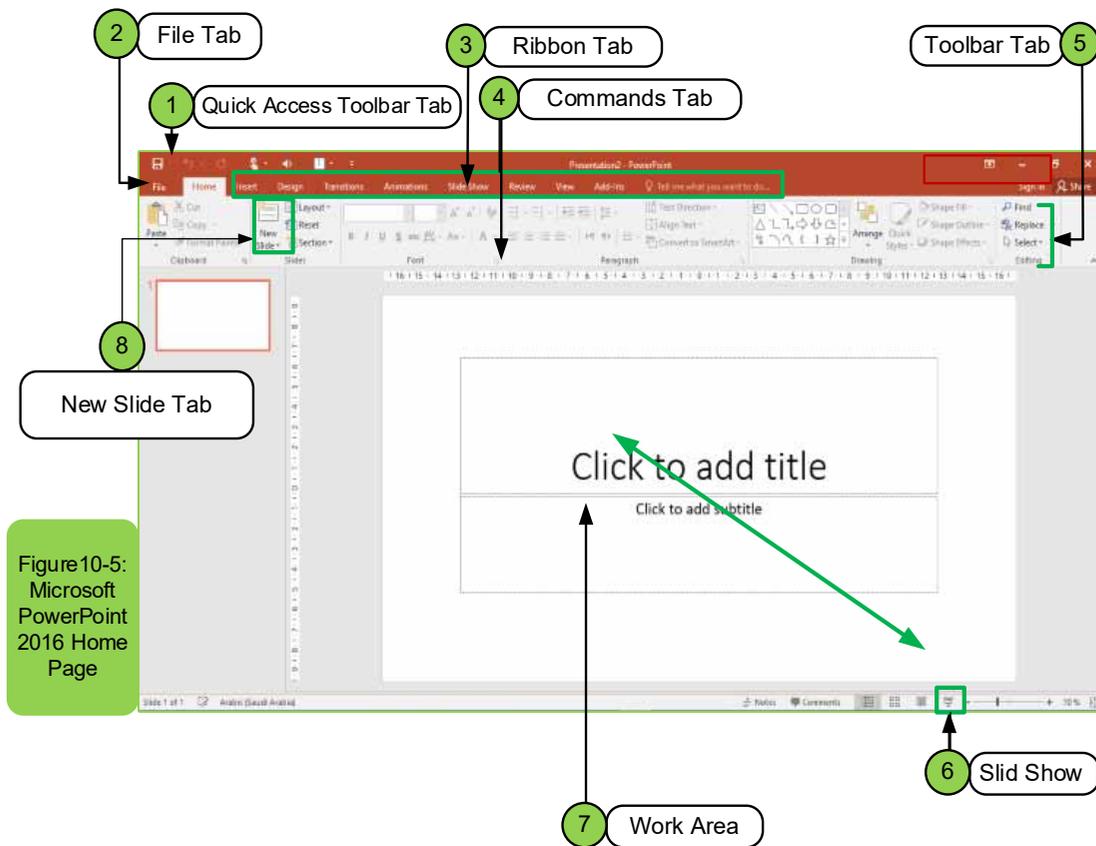


Figure 10-5:  
Microsoft  
PowerPoint  
2016 Home  
Page

- 1. Quick Access Toolbar tab:** The quick access toolbar can appear above or below the Ribbon. To change its location, click the drop-down arrow to the right of the toolbar and click Show below the Ribbon. Through the quick access tools, the user can open a new document, save, or print a file, and there are also other options inside it.
- 2. File tab:** enables the user to open a new page, print, save a file, or open an existing file inside the computer or one of the storage media.
- 3. Ribbon Tabs:** By default, in Microsoft Office PowerPoint 2016 there are more than ten tabs (except for the File menu). Sometimes you will see

coordination tabs that show if you are working with a special type of object. For example, if you are working on a photo.

4. **CommandsTab:** Each tab consists of groups of commands. For example, the Home Tab has clipboard commands, slides, font, paragraph, drawing, and editing.
5. **Toolbar Tab:** Contains numbers of options that enable you to search or replace, select, edit, and more.
6. **Slid ShowTab:** It is the button through which the user can start the show once it is finished or by using the option (F5).
7. **Work area:** The area through which the user can write or edit any text, photos, or table according to what he needs.
8. **New Slide Tab:** allows us to add any number of slides under the master slide.

### 10- 6 Home page Tab in Microsoft PowerPoint 2016

#### Skill 10 - 4 Working with the Home Page Tab



*The home page consists of several groups, as in Figure106-, and they are:*

1. Clipboard group.
2. Slides group.
3. Font group.
4. Paragraph group.
5. Drawing group
6. Finally, editing group

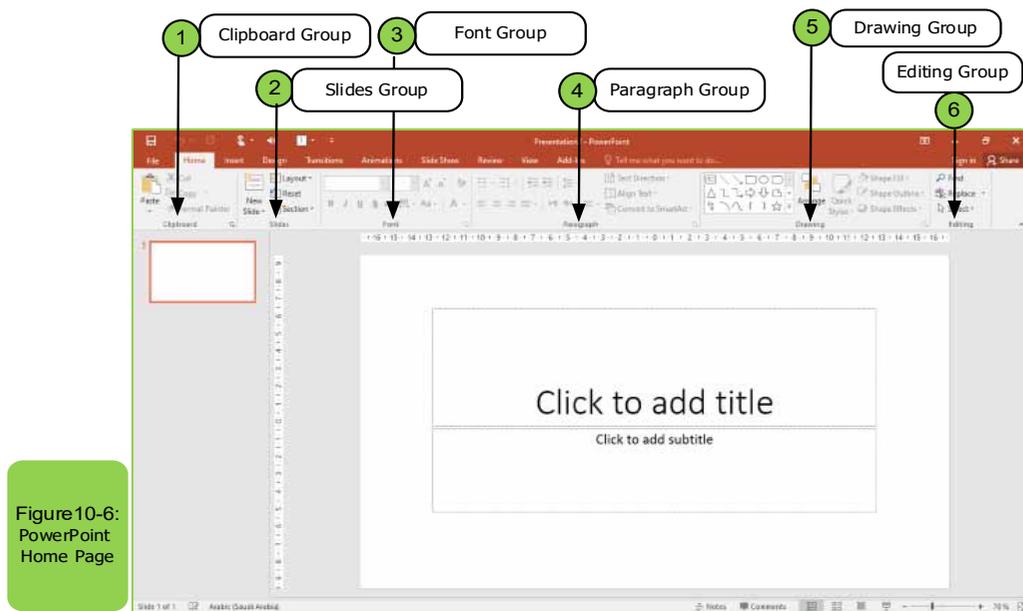


Figure 10-6:  
PowerPoint  
Home Page

**1. Clipboard group:** This group contains several options that can be used continuously within the PowerPoint program, such as an option:

- Paste (  ).
- Cut text (  ).
- Copy text (  ).
- Use the format painter (  ) to copy the formats of selected text to apply it to the rest of the text.

You can also click on the small arrow below the group to add other options (  ). To implement any of the options, we follow the following steps:

- Select the text or shape you want to copy or cut.
- Then we press the Cut option (to cut the original shape or text) or the Copy option (to make a copy with the original copy).
- Then we press Paste (to place it where we want to place it)

Table 10 -1 shows the option type, icon, and abbreviation for easier handling.

Table 10 -1: Shows icons with their abbreviation in the clipboard group

Option Name	Icon	Abbreviation
Paste		Ctrl + V
Cut		Ctrl + X
Copy		Ctrl + C
Format Painter		Ctrl +Shift+ C
Other		-

2. **Slids Group:** This group contains several things that are of great importance for the PowerPoint program, including:

- Add a new slide ().
- It can also show more slide themes ().
- You can make a slide layout or choose another type of slide layout ().
- Reset all slide elements to their original position ().
- Add a section to the slide ().

Table 102- shows the option type and icons for easier handling.

Table 10 -2: Shows the icons in the slide group

Option Name	Icon	Abbreviation
New Slide		Ctrl + N
Slide Theme		-
Slide Layout		-
Rest the slide to its original form		
Slide Section		-

**3. Font group:** This group is considered one of the groups used by which many formats can be made to the text such as changing the type of font (  Calibri Light (C) ) or font size (  ). Also, the font for the text can be made bold (  ), italic (  ), or the text contains a line below it (  ). It is also possible to make a shadow for the text (  ). Also, in the case of using the English language, the letters can be changed from small to capital or vice versa by option (  Aa ) and in many cases we need to change the color of the text (  A ) and you can also enlarge and reduce the font size by option (  A A ) and many other options. To apply any of the options, we follow the following steps:

**A- First method:**

- Select the text to which the option is to be applied.
- Directly choose the format to be applied from the font family within the home page tab.

**B- The second Method,** which is by clicking on the right mouse button after selecting the text and choosing the Font option that shows the interface in which the option can be applied.

Table 10 -3 shows the type of option and the icons for easier handling.

**Table 103-: Shows the icons in the font family**

Option Name	Icon	Abbreviation
Changing the type of font		-
Font size		-
Bold font		Ctrl + B
Italic font		Ctrl + I
Underline the text		Ctrl + U
Shading the text		-
Changing the letters from small to capital		-
Changing text color		-
Increasing or decreasing font size		-

**4. Paragraph group:** It is considered one of the most used groups in all Microsoft Office programs. For example, it is possible to center the text (  ) or

make it to the right (  ) or left (  ) or adjust the text (  ). Also, it is possible to make a bulleted list (  ) or numbered list (  ). We also find there are many other options that can be used by paragraph group. To apply any of the options, we follow the following steps:

**A- First method:**

- Select the text to which the option is to be applied.
- choose the option to apply to the selected text.

**B- Or, by clicking on the right mouse button**, a tab appears, from which we choose the “Paragraph” option, which shows a window through which the option we want can be applied.

The following Table 10 -4 shows the option type, icons, and abbreviation for easier handling.

Table 10- 4: Shows icons in a paragraph group

Option Name	Icon	Abbreviation
Centering the text		Ctrl + E
Align the text to the right		Ctrl + R
Align the text to the left		Ctrl + L
Adjust the text		-
Making bulleted list		-
Making numbered list		-

**5. Drawing group:** This group allows us to add shapes and drawings within the PowerPoint slide, for example, we can add and choose any shape that we want to use by clicking on the Shapes (  ) option that shows you many shapes, one of which can be chosen. To add any shape, we use the following steps:

- From the "Home Page" tab, we select "Shapes" that are located within the drawing group, and a menu appears as in Figure10 -7.
- We choose the shape that we want to insert by clicking on it with the left mouse button.
- Go to the place we want to place the shape in and press the left mouse button to apply.

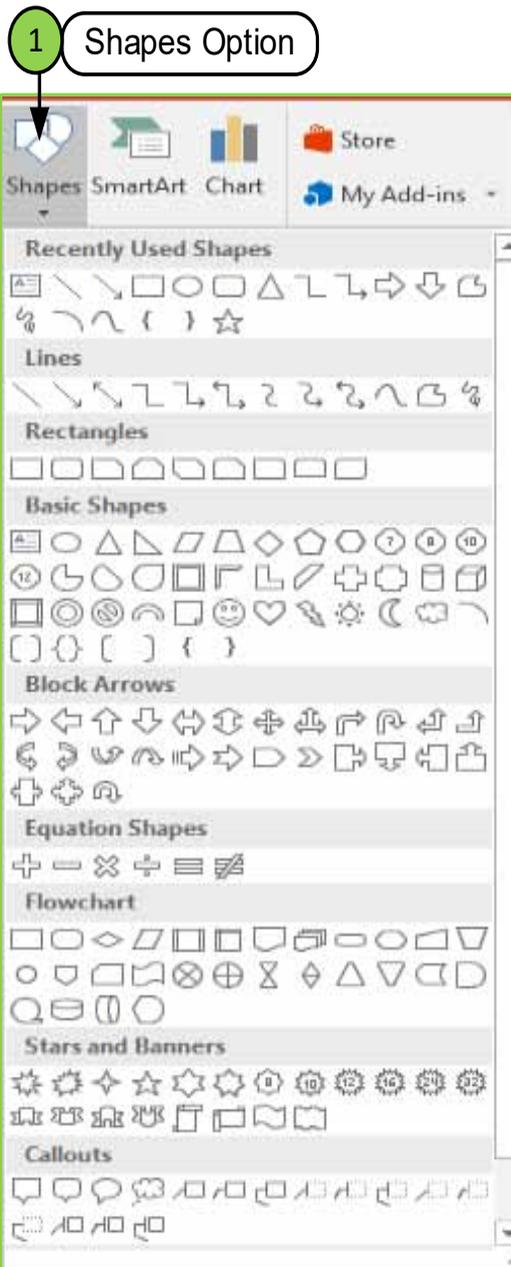


Figure10-7:  
Insert  
Shape

The objects on the slide can be changed and arranged through the option (  ). To change the order of a specific object inside the slide, we use the following steps:

- From the "Home Page" tab, we choose "Arrange" which is located within the drawing group, so a menu appears as in Figure10- 8.
- We choose the option that we want to apply to a specific object in the slide by clicking on it with the left mouse button.

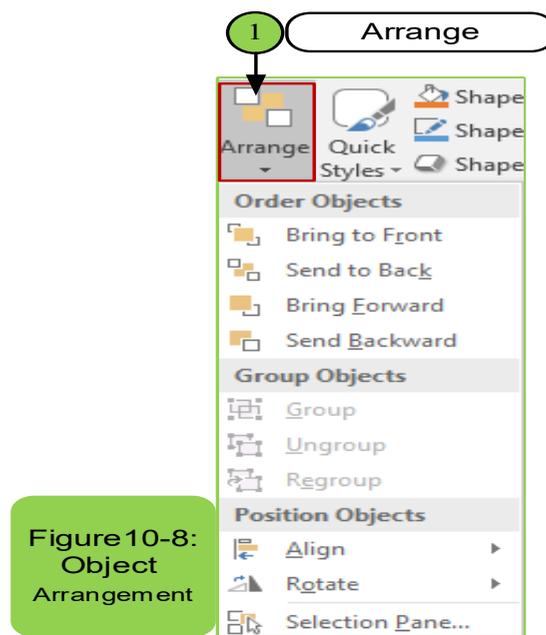


Figure 10-8: Object Arrangement

We can add different styles to the shape as desired by pressing option (  ). Various effects can be added to the shapes by clicking on the option (  ) in addition to coloring or filling the shape through the option (  ). The drawing group contains other options that can be obtained by clicking on the arrow (  ) at the end of the group as in the previous and subsequent groups. For example, to fill a specific shape inside a slide, we use the following steps:

- From the "Home Page" tab, we choose "Shape Fill" that is located within the drawing group, and a menu will appear to us, as in Figure10- 9.
- We choose the option that we want to apply to a specific shape in the slide by clicking on it with the left mouse button.

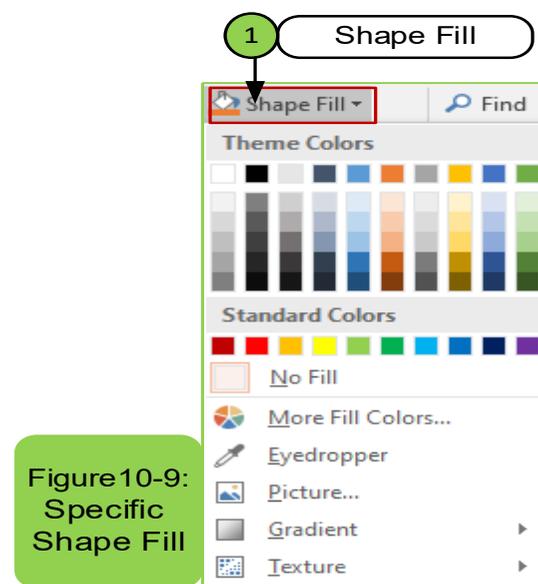
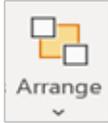


Figure 10-9: Specific Shape Fill

Table 5 -10 shows the type of option and icons to facilitate their handling.

**Table 5 -10: Shows the icons in the drawing group**

Option Name	Icon
Shape option	
Arrange Objects in the slide	
Add Shape styles	
Add Shape effects	
Add Color and fill	
other	

6. **Editing group:** This group enables us to have several options, for example:

- If we are searching for a word inside the PowerPoint presentation, we can use the option ( Find) or by pressing (Ctrl + F).
- Through this group we can replace a word inside text by option ( Replace ▾) or by pressing (Ctrl + H).
- It is also possible through this group to select a specific text or all the text inside the PowerPoint slide through the option ( Select ▾) or press (Ctrl + A).
- We find the explanation above shows all the options within the home tab we hope we have covered within this course. For example, to search or replace a word within a slide we use the following steps:
- From the "Home" tab, select "Replace", which is located within the "Editing" group, and a menu appears for us, as shown in Figure10- 10.
- We choose the "Replace" option by clicking on it with the left mouse button. A window appears to enter the word you wish to replace and the replaced word.

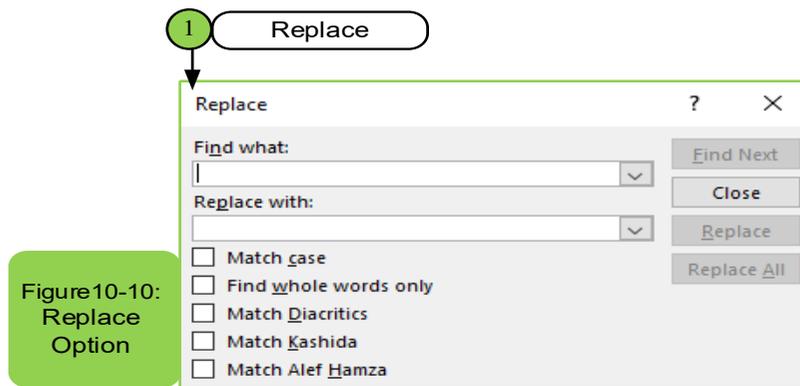


Figure10-10:  
Replace  
Option

Table 10 -6 shows the option type and icons for easier handling.

Table 10- 6: Shows icons in an editing group

Option Name	Icon	Abbreviation
Search for a word	 Find	Ctrl + F
Replace a word	 Replace ▾	Ctrl + H
Selecting specific text or all the text	 Select ▾	Ctrl + A

### 10 -7 Insert Tab

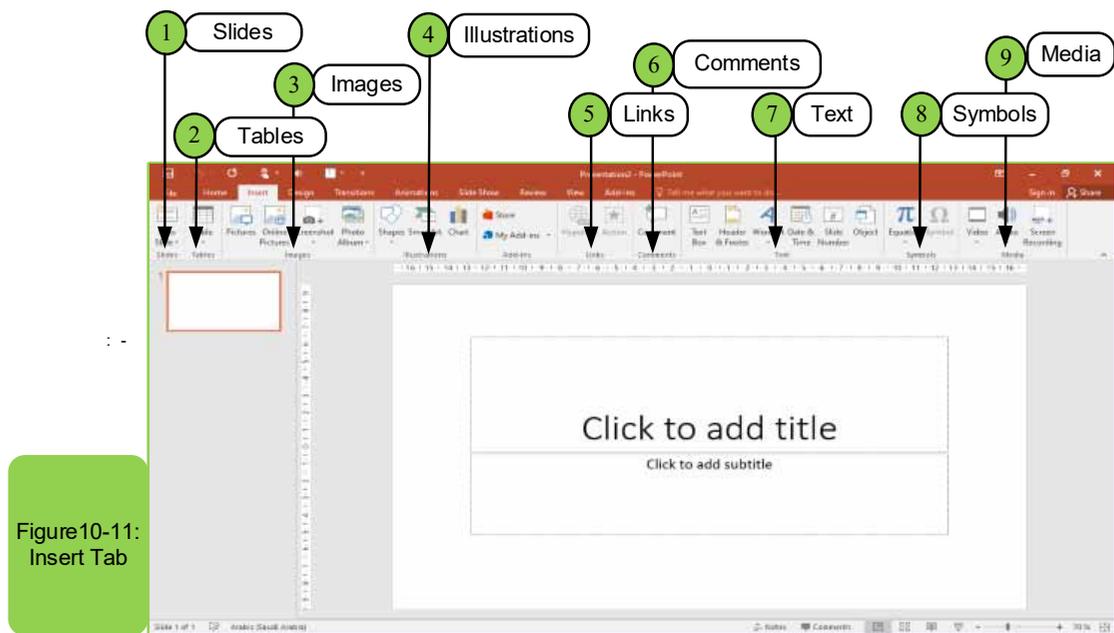
**Skill 10 - 5**

Using the Groups included in The Insert Tab



The Insert tab consists of several groups (or orders) as in Figure10- 11 which are:

- Slides.
- Tables.
- Images.
- Illustrations
- links.
- Comments.
- In addition to two sets of text and media.



Also, some groups will have a small button in their lower left corner, clicking on this button will open a list with more features associated with that group.

**1. Slides Group:** This group contains several options such as:

- Insert a new slide by pressing (  ).
- Choose a slide theme from the existing themes by clicking on the small arrow in the right of the shape (  ) that gives you several options such as title slide or title and content ... etc.
- It contains several other options that user can use, such as choosing the appropriate layout that you want to use to create the slide by clicking with the mouse on the layout that you want to use.
- Another way to choose a specific layout is:
  - Clicking the right mouse button in the existing slide will show you several options, including the layout
  - Click on the Layout option. Layout options appear as in Figure (10- 12).

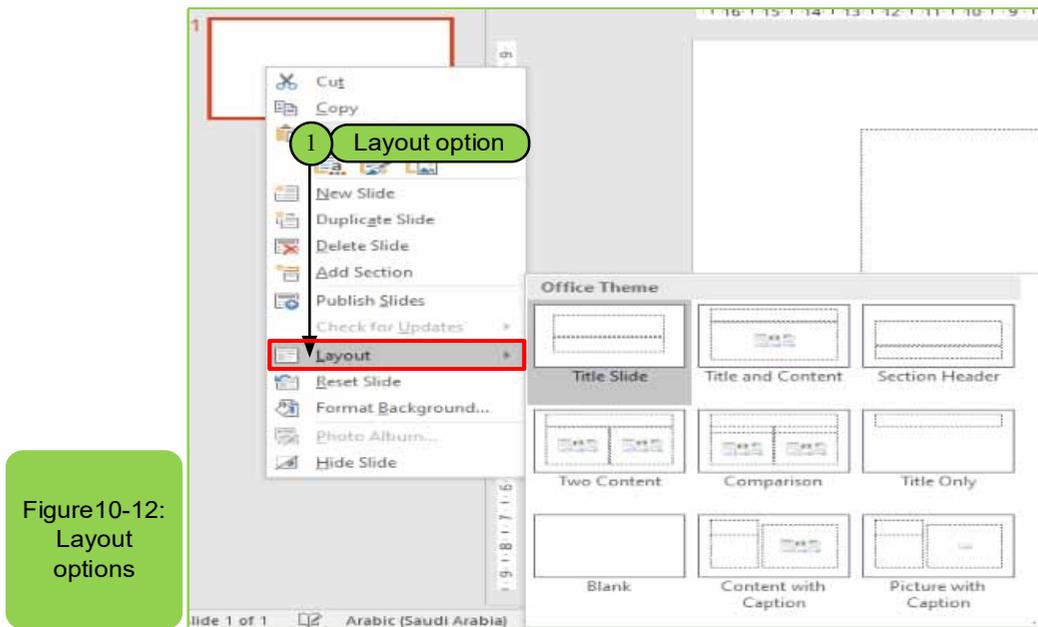


Figure10-12:  
Layout  
options

**2- Table Group:** This group considers its commands are important commands that we use within the power point program and it has several methods:

- **First method:** Insert a table (  ) with a certain number of rows and columns by dragging on the slide to create a table with a specific size, which is as follows.
  1. Place the mouse pointer where you want to insert a table.
  2. On the “Insert” tab, click Table option, then drag the table dimensions onto the grid, then click the left mouse button, see Figure 10 -13.

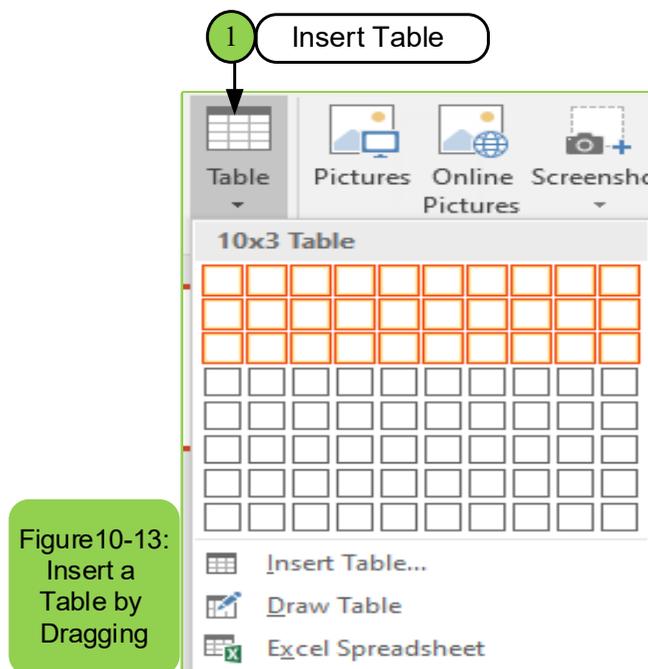
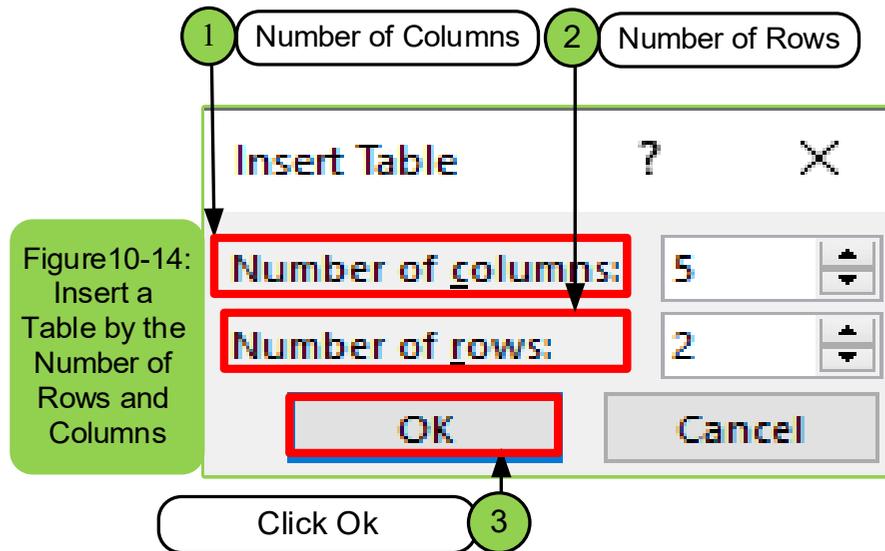


Figure10-13:  
Insert a  
Table by  
Dragging

- **The second method:** Use the “Insert Table” command located within the “Table Tab”, then specify the number of rows and columns and click “OK” as in Figure 10- 14.



**3. Images Group:** This group is used to add pictures through several options:

- Add photos from the internet directly by clicking on the option (  ).
- Add photos through an open window on the screen (  ).
- Insert an image on the computer by pressing option (  ).
- Insert an image from an existing or created photo album (  ).

And in each option, by simply clicking on it or the arrows next to it, you will see several options that help you to accomplish the work and to insert an image exists inside the computer, we follow the following steps:

- Determine where to insert the image by left-click.
- From the “Insert” tab, choose “Image” that is located within the “Images” group as shown in Figure 10 -15.
- The Image window appears for us and we select the image we want to insert and click on it with the left mouse button.
- Click on the “Insert” option to execute.

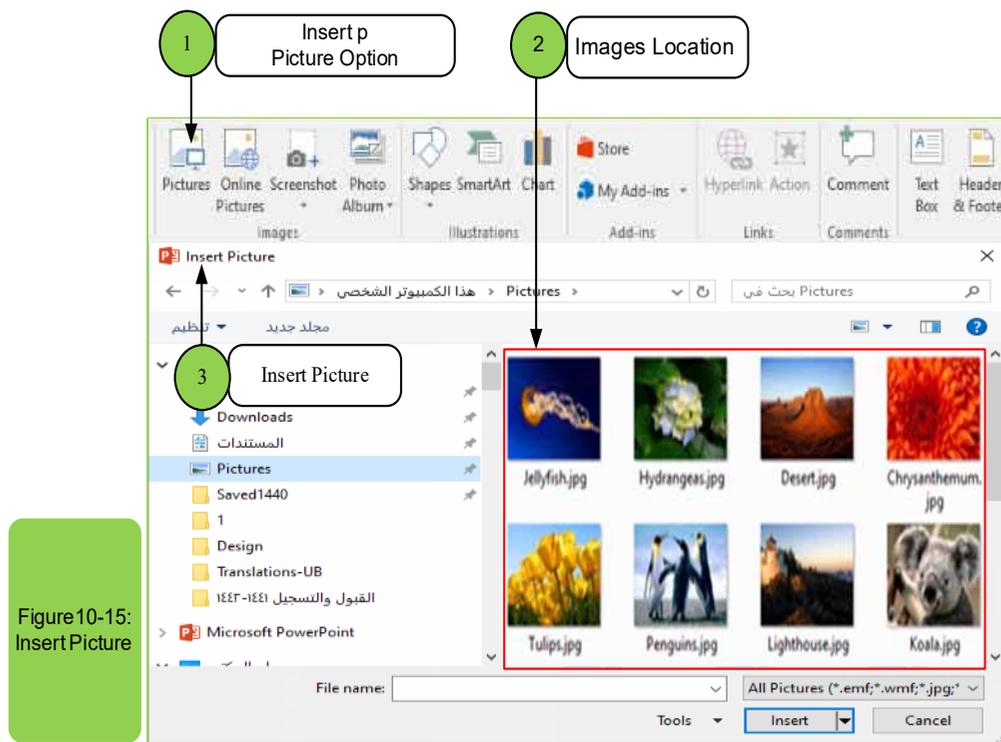


Figure 10-15:  
Insert Picture

**4. Illustrations group:** We find in the Power Point presentation program we can include automatic shapes such as:

- Circle and rectangular shapes or arrows.
- Add flowcharts.

**To add shapes inside the Slide of powerpoint program, go to:**

- Insert tab.
- Choose the Shapes (  ) option within the group for illustrations.
- It displays several shapes.
- Through which the shape to be applied is chosen as in Figure 10-16.

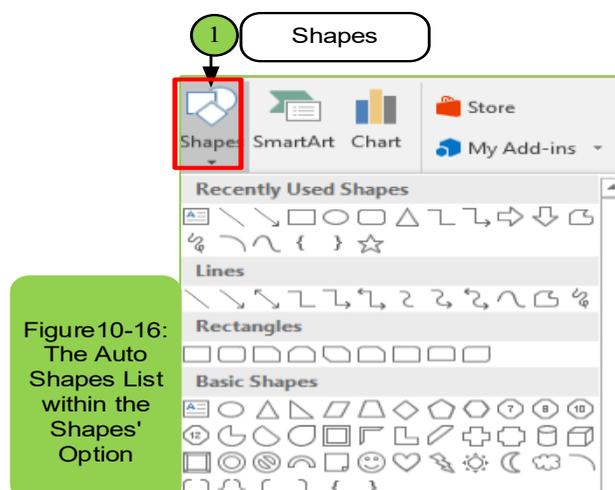


Figure 10-16:  
The Auto  
Shapes List  
within the  
Shapes'  
Option

*If you need to add SmartArt, we follow these steps:*

- From the "Insert" tab, choose "SmartArt", which is located within illustrations group, click on it with the left mouse button, and a list will appear, as shown in Figure 10 -17.
- We go to drawing options to choose the desired drawing shape
- Then we choose the desired shape
- We click on the "OK" button to apply the required shape

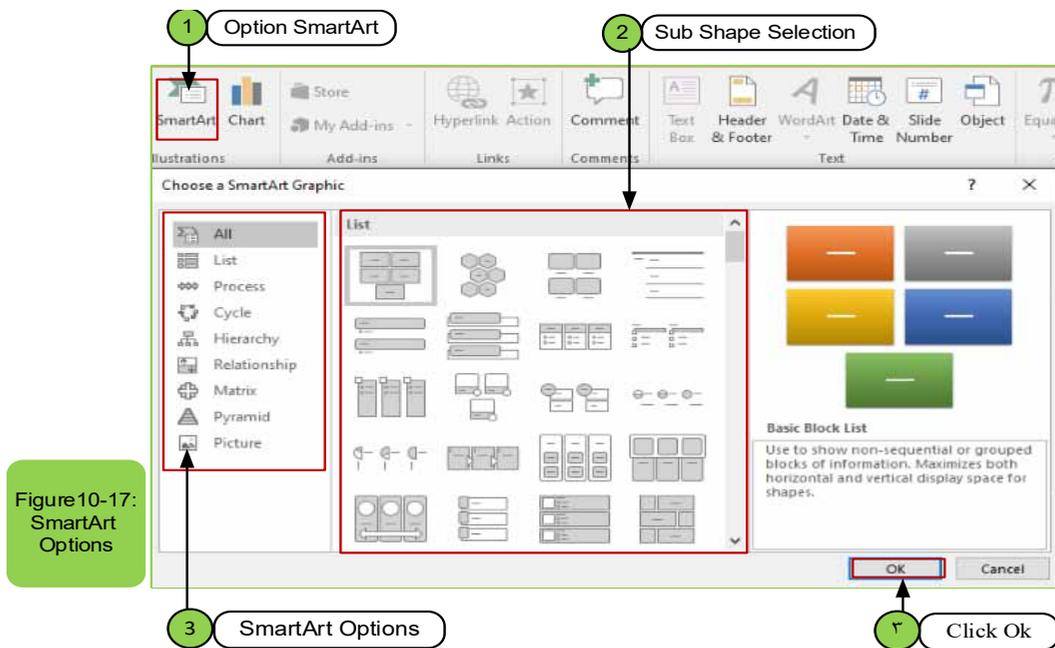


Figure10-17:  
SmartArt  
Options

The illustrations group also contains the chart option (  ), through which you can show many shapes that can be inserted, which often help us to represent the data and also can be used within the powerpoint program. When you click on the chart option, the following screen appears for you as in the figure10 -18.



Figure10-18:  
Charts list

**5. Links group:** This group is considered one of the commands through which it is possible to:

- Connect the slide to internet.
- Or link it with another slide.

The option hyperlink (  ) links (text, images or anything) either to a web page or an email or to other slides and when you click on it the screen will appear as in Figure 10- 19.

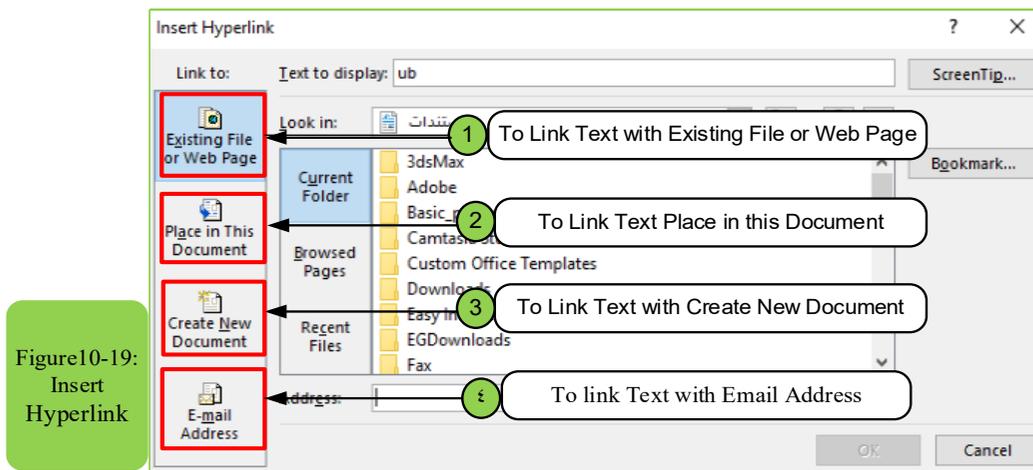


Figure10-19:  
Insert  
Hyperlink

There is also another option is the option action (  ), through which a feature can be added. When clicking on any object or moving with the mouse over it, you will either be taken directly to the slide that you have selected to perform the action or open a program. When you click on it with the mouse, the figure 1020- appears to us.

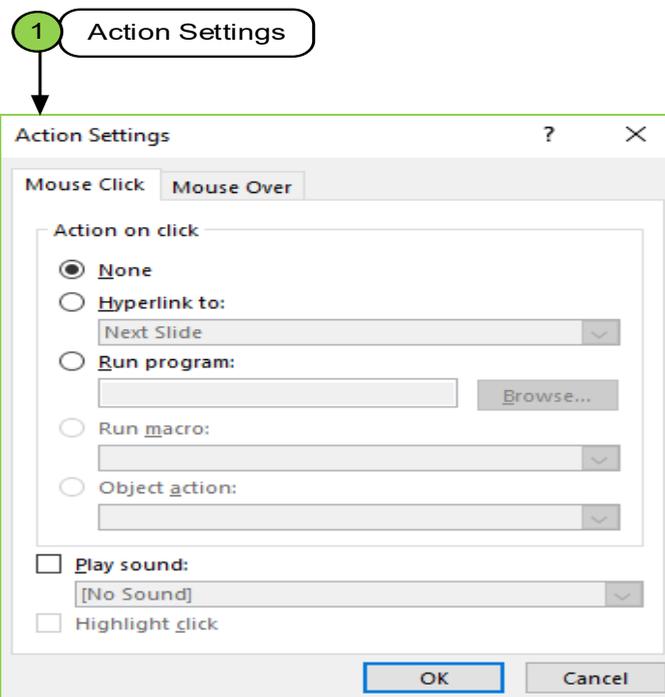
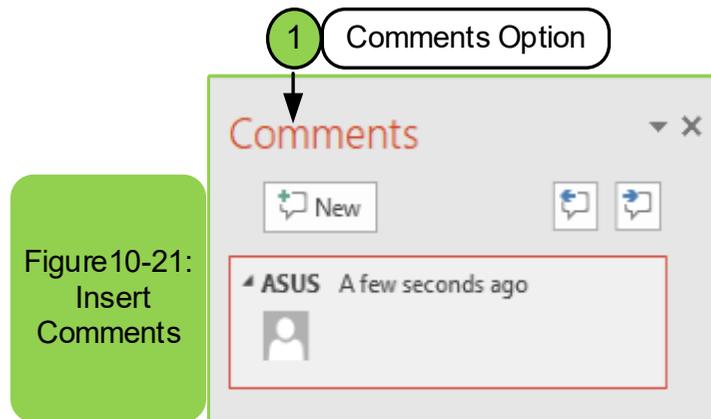
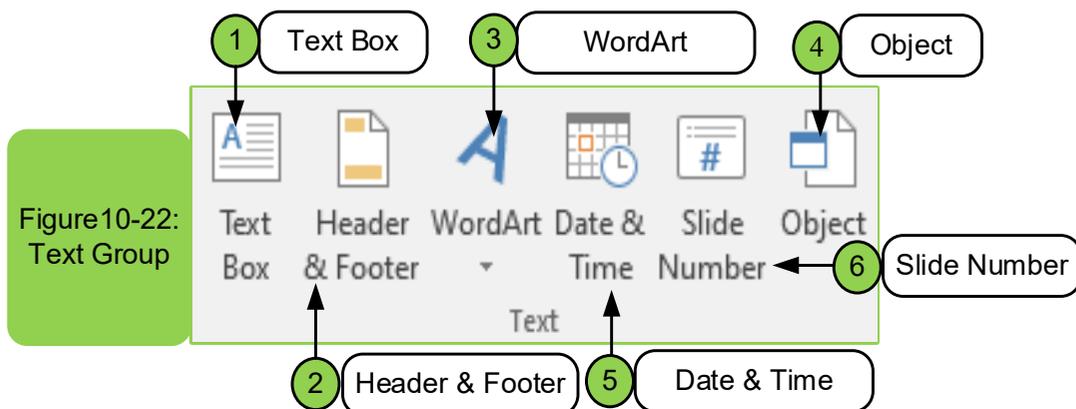


Figure10-20:  
How to Use  
Action  
Setting

There is also the option Comments in which you can insert a comment by clicking on the option (  ), and when you click on it the screen appears as in Figure10- 21.



**4. Text group:** This group is considered one of the most important groups that are used continuously within any slide and through which many edits can be made to the text or slide and the most important commands of this group appear in Figure 10- 22. We will explain the contents of this group.



From Figure 10- 22 we can make several commands such as adding a text box through the option (  ) and this is done by clicking on it and then we write the required text inside the box that appeared to us. Also, we can add a header and footer for the page through the option (  ) which by clicking on it and choosing it, the screen appears as in Figure 10- 23. The options inside the header and footer allow us to add a time and date to the slide. It also enables us numbering the slide according to the available numbering, also we can add footer and an option that contains do not show on title slide.

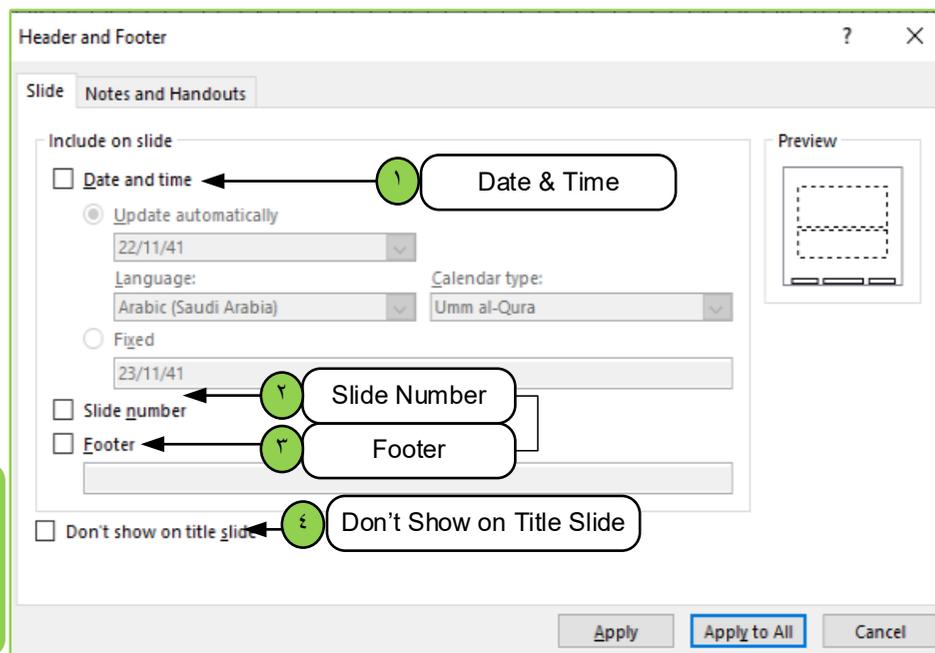


Figure 10-23:  
Insert  
Header &  
Footer

Also, from Figure 10- 22 we can write words in artistic ways by clicking on the option (  ) that shows several styles and we can choose the style that we want to apply as in Figure 10 -24. When choosing the style, we want to use, we add the text that we want to write inside the style.

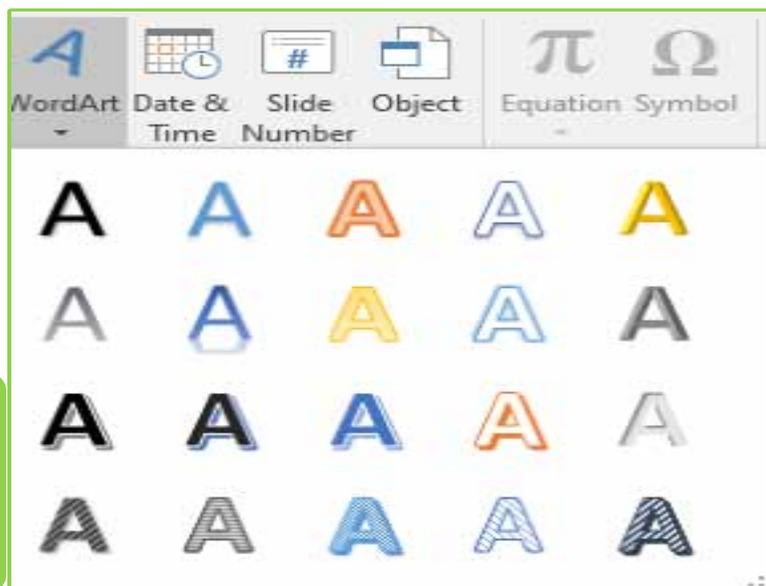


Figure 10-24:  
WordArt  
Styles

**Through this group, you can add:**

- Date and time by clicking on the option (  ), and when clicking on it, the same screen appears in Figure 10 -23.
- We can insert the slide numbers through option (  ), which by choosing it also shows as in Figure 10 -23.

- Also we find inside the text group there is another option which is the ability to add an object by clicking on the option (  ) and when pressed it the screen appears as in Figure10 -25.

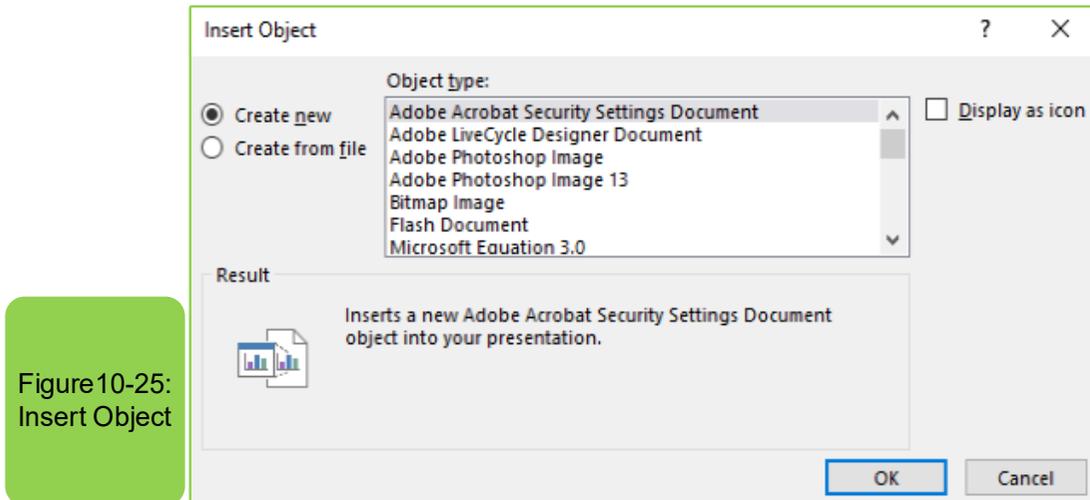


Figure 10-25:  
Insert Object

We find that the option insert an object enables us to insert equations through which we can write an equation or files (pdf) and save it with a PowerPoint document, and through it we can choose the document that we want to insert as there are many other options that can be inserted through the object option. Table 7 -10 shows all options and clarifies their required icons.

Table 710-: Shows the icons in an insert group

Option Name	Icons
Insert new slide	
Insert new slide theme	
Insert table	
Insert photo from internet	
Insert photo from screenshot	

Option Name	Icons
Insert picture from the computer	
Insert image from photo album	
Shaps	
Chart	
Insert SmartArt	
Hyperlink	
Action	
Comments	
Insert text box	
Header and footer	
Insert word art	
Insert time and date	
Insert Slide number	
Insert an object	

**7. Symbols group:** This group is considered one of the groups through which we can insert any symbol inside the slide, especially mathematical symbols that are not present on the keyboard. An symbol option (  ) can be used to insert a symbol that is not present on the keyboard and when it pressed:

- Identify where we want to add the symbol.
- Go to "Insert tab" and choose symbol option (  ).
- Many symbols appear to us as shown in Figure 10 -26
- Then we choose the symbol we want.
- Then press the "Insert" button to apply the option.

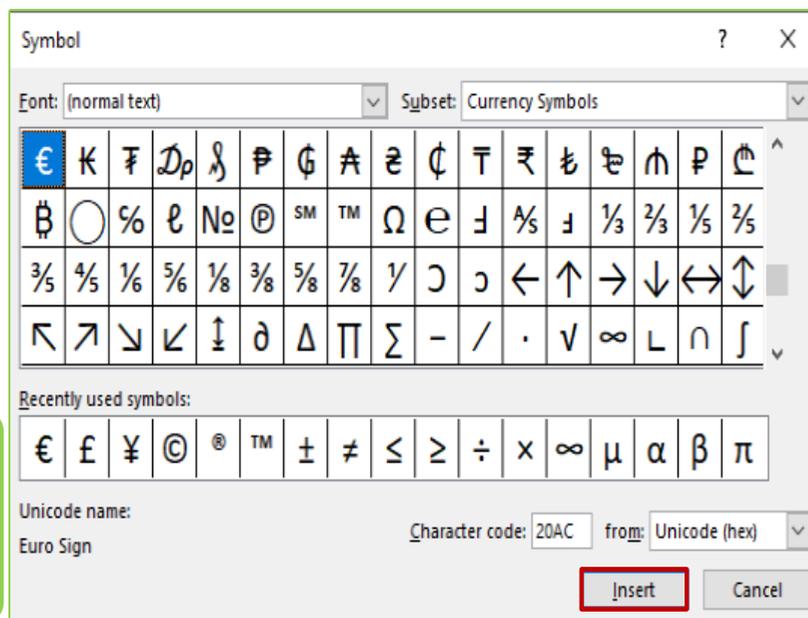


Figure 10-26:  
Insert a  
Symbol

Also in the case of the need to add a mathematical equation or any mathematical symbol, we can do that through the option equation (  ) and when you pressed it allows the possibility of inserting or writing any equation as in Figure 10 -27 that enables us to use an existing equation or create a new equation. Table 10- 8 shows the icons in a symbol group.

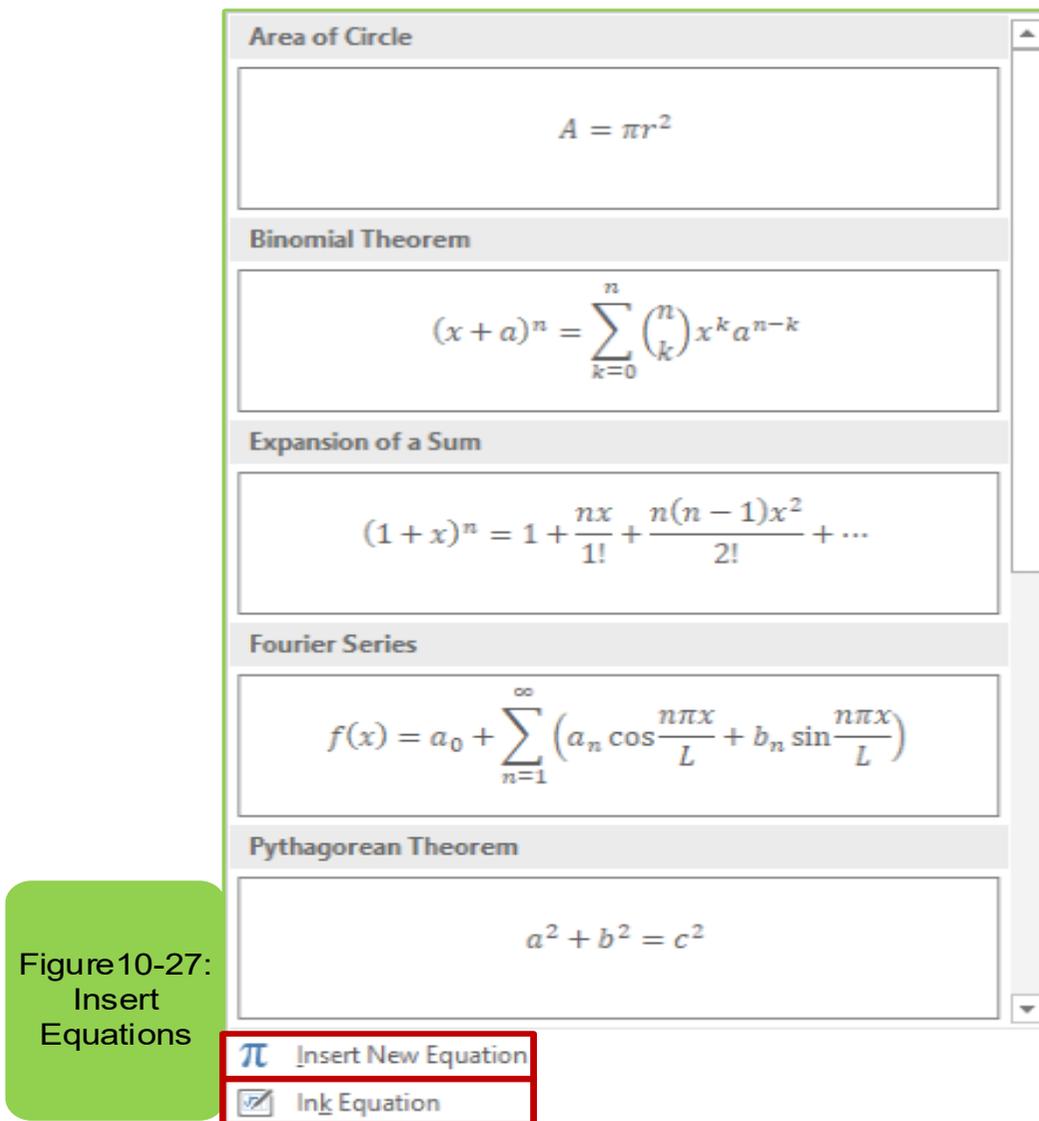


Figure 10-27:  
Insert  
Equations

Table 10 -8: Shows the icons in a symbol group

Option Name	Icon
Insert equation	
Insert Symbol	

**8. Media group:** This group is the last group within the insert tab and through it a video can be inserted by pressing the command (  ) or sound (  ) and it is also possible to record and add sound to the slide (  ). When adding a video, clicking on the video option, and when clicking on it, the screen will appear as in Figure (228-), which allows us to add video via the internet and in this case you must be connected to internet or the option video on my PC and then you choose the video you want to insert. Also, in the case of the need to record a sound, two

options appear to us, one of which is choosing the voice from the computer or recording the sound. As in case of using the other option to record and add sound to the slide, the options in Figure 10- 28 show to us.

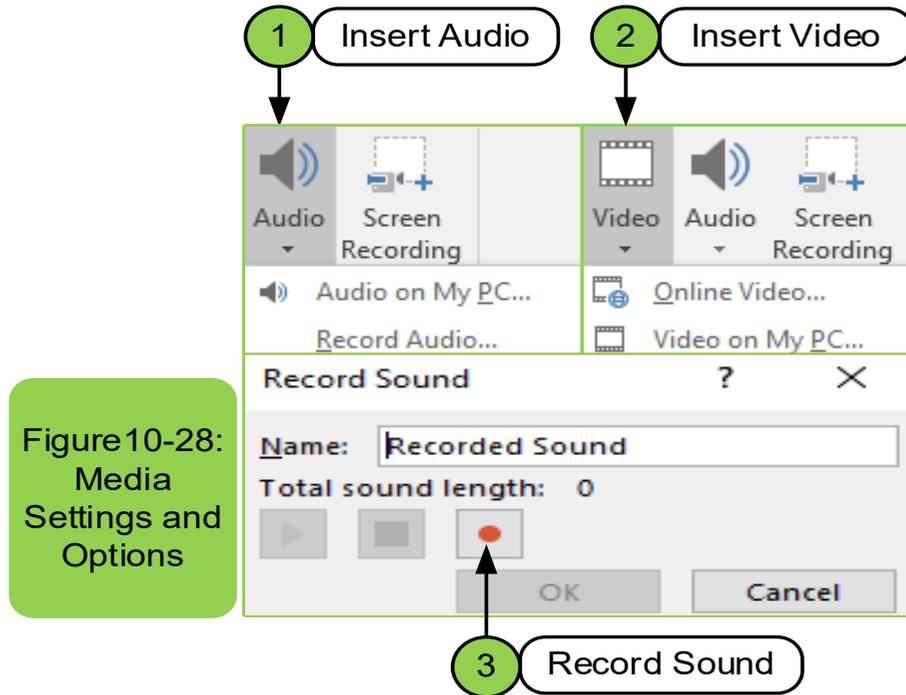


Figure 10-28: Media Settings and Options

Table 10 -9 shows options within the media group with their icons.

Table 10 -10: Shows icons in the media group

Option Name	Icons
Insert video	
sound	
Screen recording	

10- 8 Design Tab

**Skill 10 - 6**  
Working with Design Tab



The Design tab consists of several groups (or commands) such as a themes Group, variants group, and customize Group, as in Figure10 -29. Also, some groups will have a small button in their lower right corner. Clicking this button will open lists with more features associated with that group.

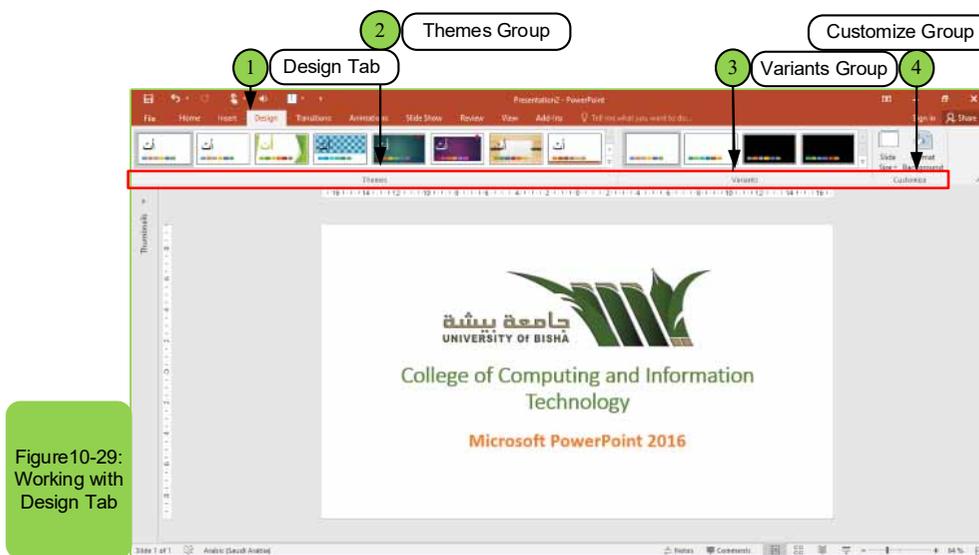


Figure10-29:  
Working with  
Design Tab

**1. Themes group:** It is the group through which one of the themes is chosen to apply to the slides as in Figure10 -30. Once you have selected a specific theme you must choose a design from set of different designs in order to apply the theme to it.

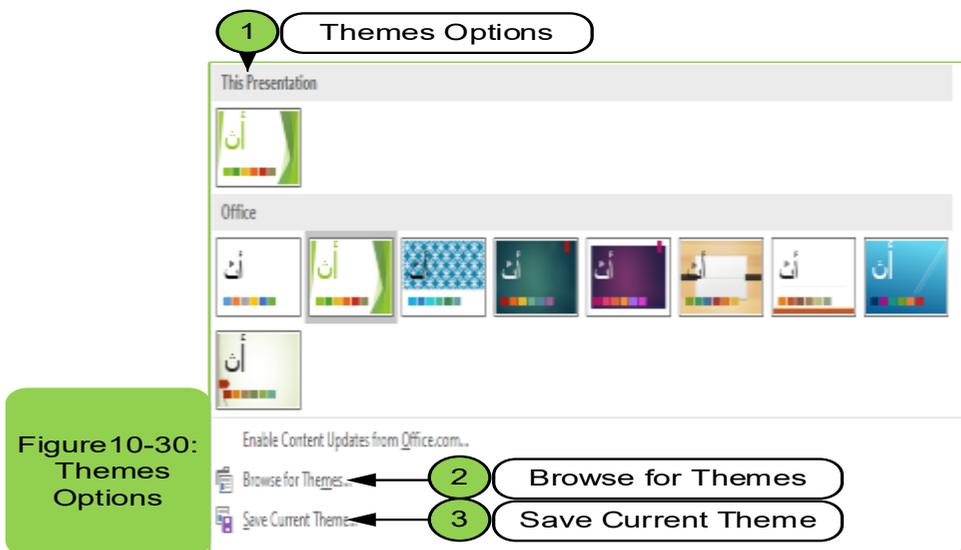
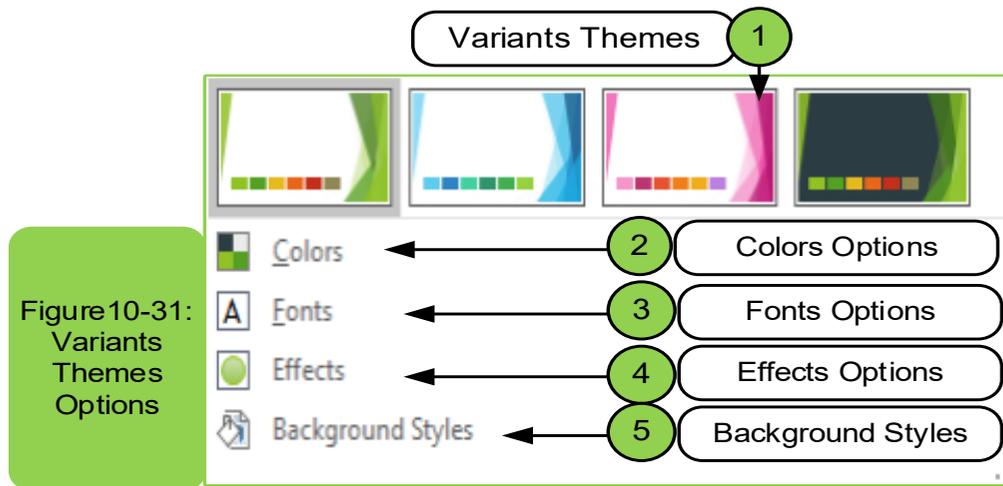
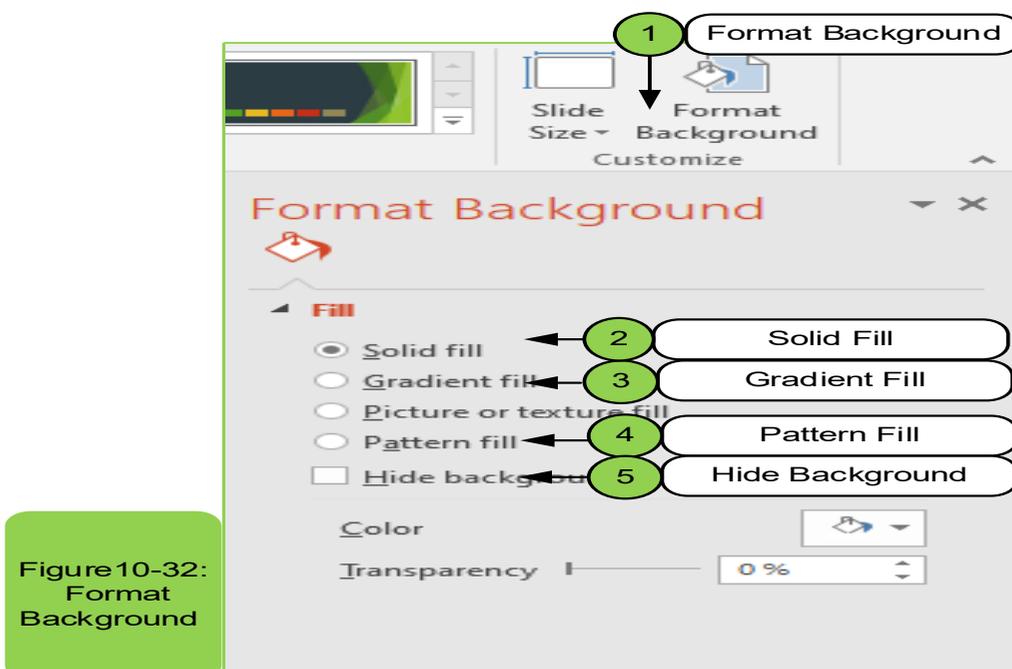


Figure 10-30:  
Themes  
Options

2. **Variants group:** In this group we choose the theme that we want to apply to the slide as in Figure1031-, which gives us many options through which it can be added to the slide such as color options, font options, effects, and in addition to the styles that we want to apply which gives strength to the presentation.



3. **Customize group:** This group enables us to choose the slide size by pressing the slide size option (  ) or formatting the slide background by pressing the background format option (  ). And when choosing the slide size option, it allows us to choose the available size that we want to apply to the presentations. In the case of the need to change the format of the background, we can through the option format the background that provides us with several options, as in Figure10 -32 through which you can arrange or hide design elements by the current design.



10- 9 Transitions Tab

**Skill 10 - 7**  
Using Groups included in Transitions Tab



The Transitions tab consists of several groups (or commands) as in Figure 10- 33, such as:

- Preview group.
- Transition to this slide.
- Timing group.

Also, some groups will have a small button in their lower right corner, clicking on this button will open a list with more features related to that group and it is related to the slide as a whole in case of needing to add a transition method.

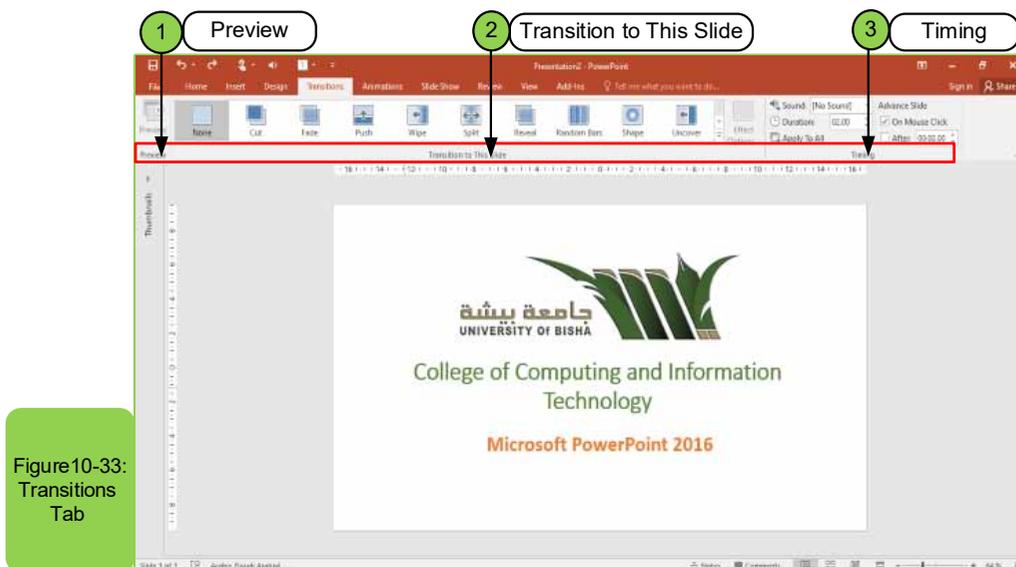


Figure 10-33:  
Transitions  
Tab

1. **Preview group:** It is the group through which a preview for the selected transition to this slide is applied as in Figure 10- 34. Once you have chosen the transition, it will be immediately performed, and the shape of the preview command will turn into a preview with a star during the execution.

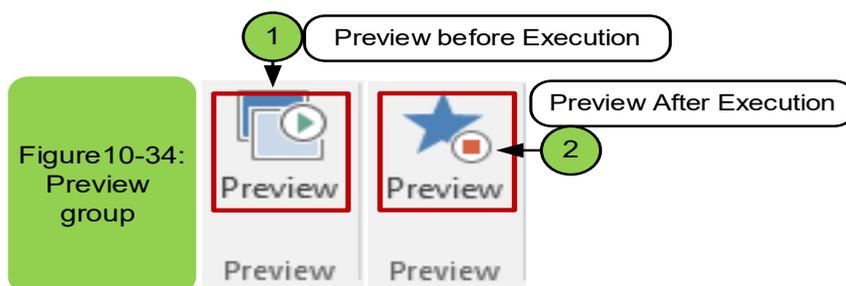


Figure 10-34:  
Preview  
group

To apply the commands in Figure 1034-, first you must determine the transition from the second group, after which the command can be executed or paused.

**2. Transitions group:** It is the group through which a transition (animation) is chosen to be applied on the chosen slide and we find that there are many options for animations that can be applied to the slide as in Figure 10- 35. Once you have chosen the transition it will be done directly, and the shape of the preview turns into a preview with a star during execution. Also, through the effect options, several effects can be added to the transitions such as the effect being vertical or horizontal.

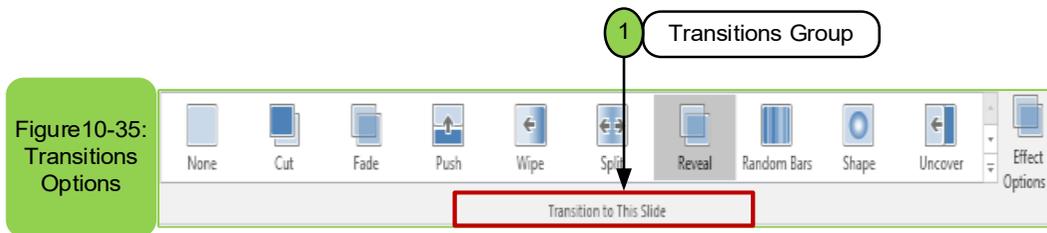


Figure 10-35:  
Transitions  
Options

**3. Timing group:** It is the group through which the way to add sounds to the slide during the transition is chosen, and through it the timing of the transition between slides can be determined as in Figure 10 -36.

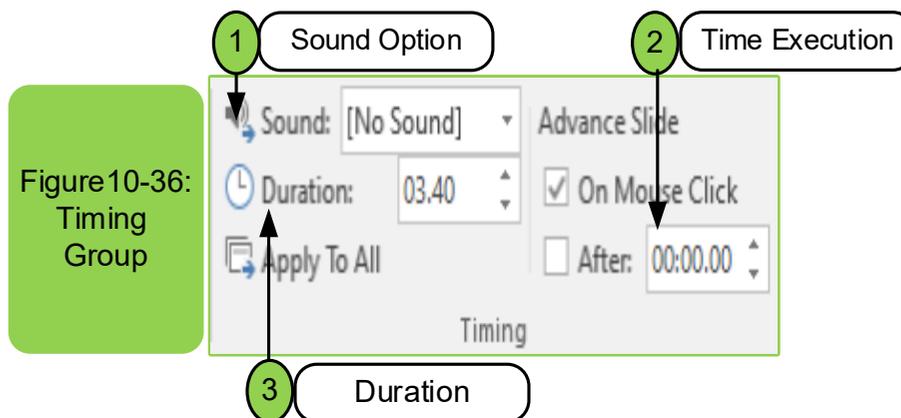


Figure 10-36:  
Timing  
Group

We find on using sound options, they help us to choose the appropriate sound among the existing sounds that we want to show during the transition between slides while we find the (duration), it helps us in determining the duration of the transition to the next slide while the option of (after) means the duration of the slide and then the transition to next slide. Finally, after choosing the animation you want to apply and you want to apply it to all slides, just click (apply to all).

10- 10 Animations Tab

**Skill 10 - 8**  
Using the Group included in Animations Tab



The animations tab consists of several groups (or commands) such as preview group, animation group, advanced animation group, and timing group, as in Figure10- 37. Also, some groups will have a small button in their lower right corner, clicking on this button will open a list with more features associated with that group and animations tab to make the animation for part of the text or the entire text in the slide.

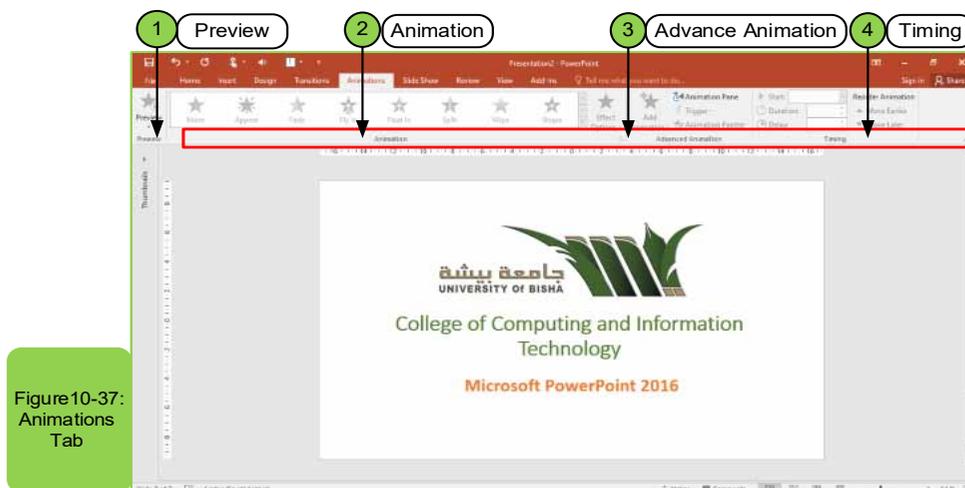


Figure10-37:  
Animations  
Tab

**1. Preview group:** It is the group through which a preview of the selected animation from the options of animations or advanced animation is applied. Once you choose the animation it will be performed directly, and the shape of preview will turn into a preview with a star during the execution and the animation is performed on a specific text, picture, or anything inside the slide.

**2. Animation group:** This group contains number of animations that can be applied on the selected text in the slide as in Figure10- 38. First, you must select the text and then choose the animation that you want to perform. Also, the effect of the selected animation can be changed by choosing the effect options (  ) Also, there is the ability to add effects to the entrance and exit of the animation according to the type of effect.

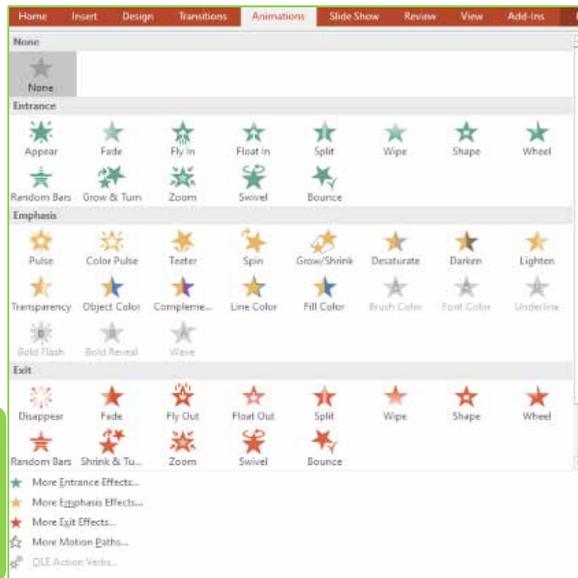


Figure 10-38:  
Animations  
Options

**3. Advanced Animations:** This group contains number of animations that enable us to add animation to the selected objects and then it will be considered as a new animation that can be added after adding the original animation from a group of animations and in the case of execution of another new animation it allows us to do so. Figure 10-39 shows all the options in this group.

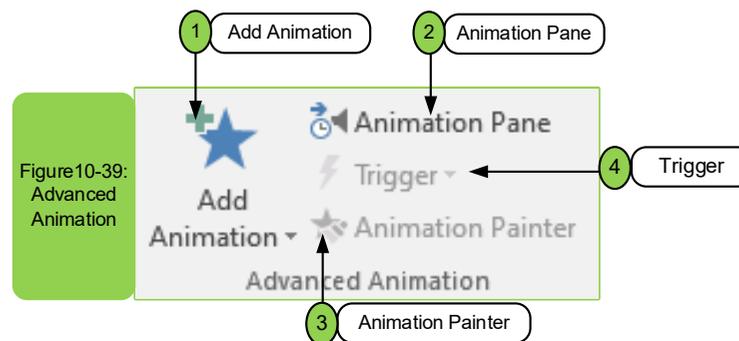


Figure 10-39:  
Advanced  
Animation

We find that after adding the animation we want from option (1), other options will be automatically activated and can be applied, such as option (2), which allows you to preview and edit the timing of the animation. We also find option (3) enables us to copy the animation to apply it to several objects through double-click on the Animation Painter and we can apply it using the shortcut (Alt + Shift + C). Finally, we find the fourth option that tells us how to apply the animation, when you click the mouse or on bookmark.

10 -11 Slide Show Tab

**Skill 10 - 9**  
How to Use the Groups included in Slide Show Tab



The Slideshow tab consists of several groups (or commands) such as Start Slide Show Group, the Setup Group, and the Monitors Group as shown in Figure10 -40. Also, some groups will have a small button in its lower right corner.

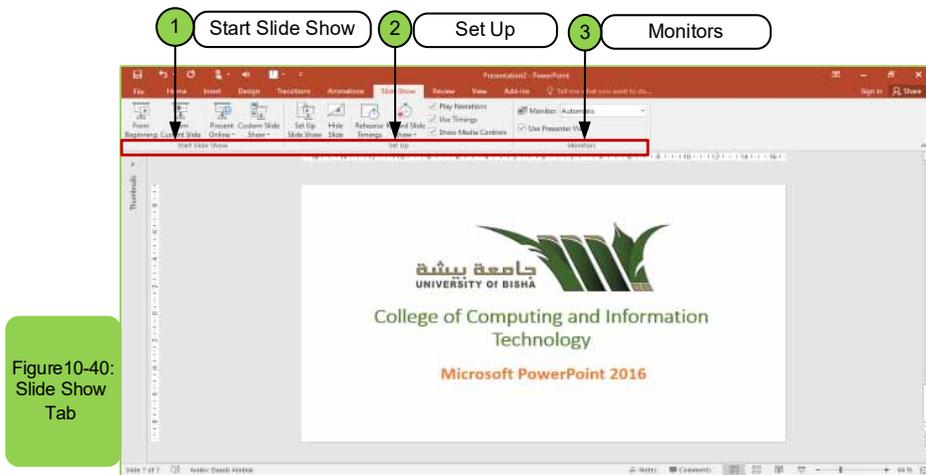


Figure10-40:  
Slide Show  
Tab

**1. Start Slide Show group:** It is the group through which several options can be performed on the slide as shown in Figure10 -41. Option (1) allows us to start the slide show from the first slide of the presentation, as we can also press the key (F5) on the keyboard or click on the figure (🖥️). In case of the need to start from the current slide that appears on the screen, we can choose option (2). As for option (3), we can perform the presentation via the Internet. To do so, you must have an account of Microsoft Office that allows others to see the slides in a web browser. As for the last option, if we need to show custom (selected) slides, we can choose option (4).

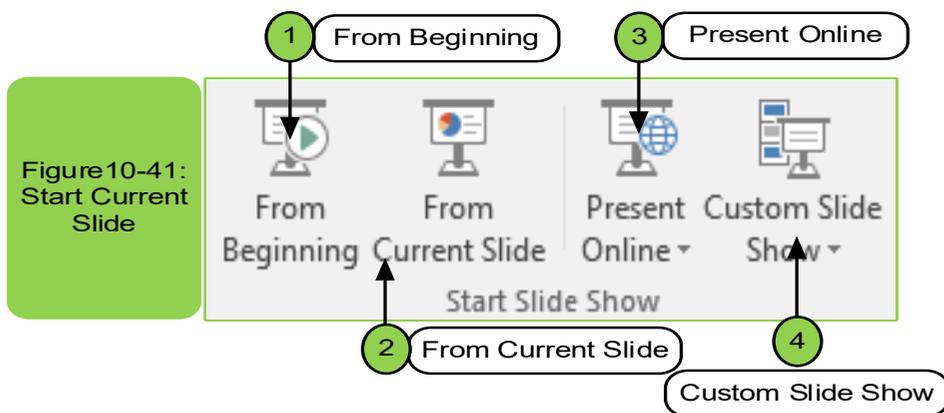


Figure10-41:  
Start Current  
Slide

**2. Set Up group:** It is the group through which several settings are applied on the slide as shown in Figure10 -42. We find that option (1) allows us to adjust setup for slides from advanced options that appear in slides.

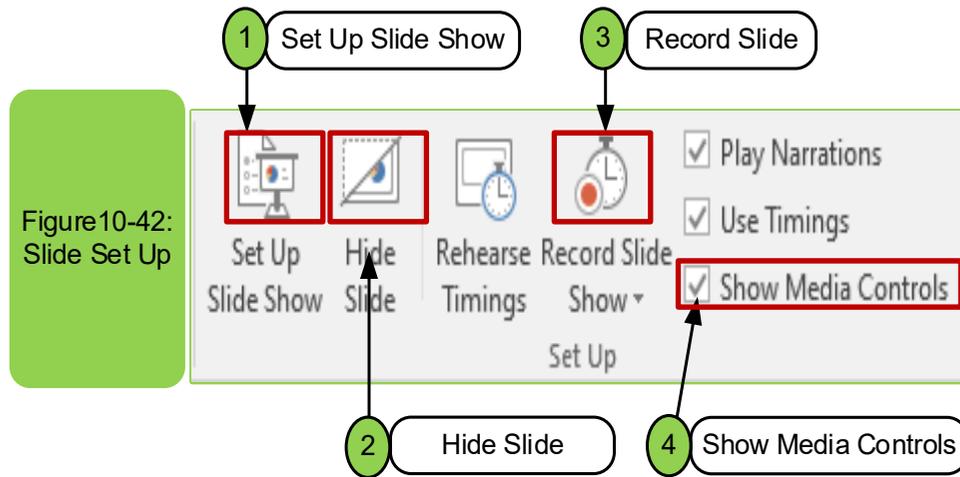


Figure10-42:  
Slide Set Up

When we press option (1) the screen appears to us as in Figure10- 43, which gives us several options for the show and upon completion of all the settings mentioned in the screen we can click OK to apply.

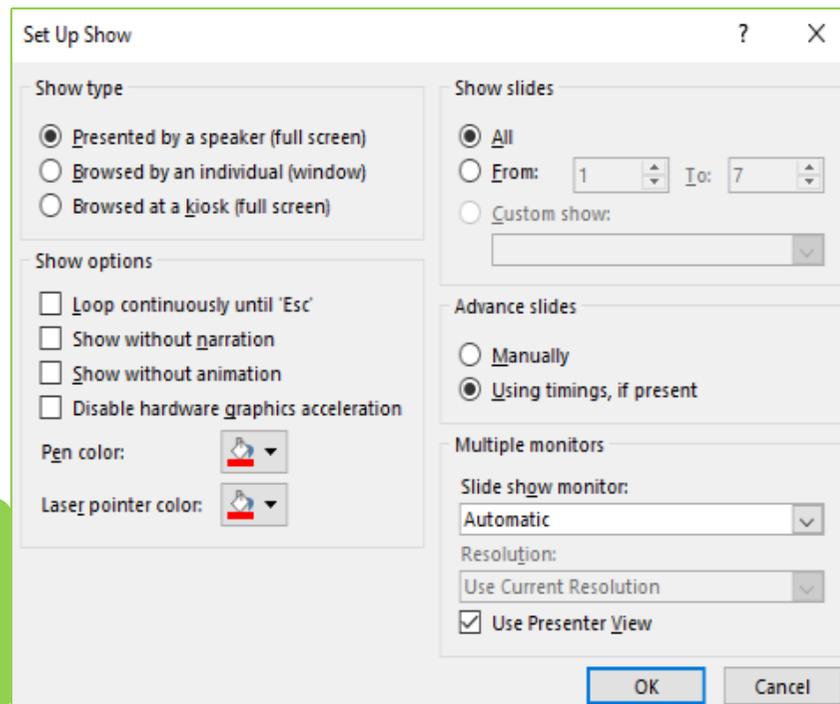
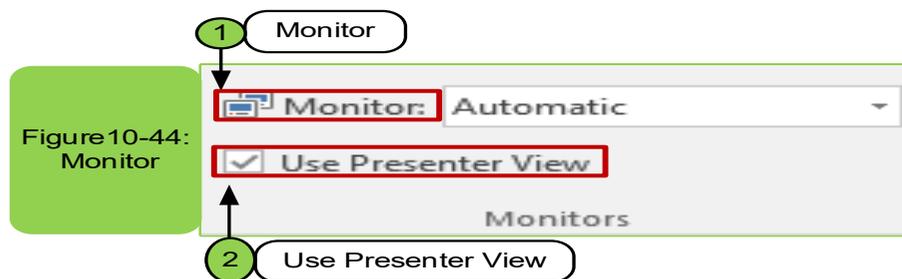


Figure10-43:  
Set Up  
Show

As for option (2) in Figure (10 -42), it enables us to hide specific slides from the presentation, and these slides we want to keep in the presentation and do not delete them. This is done only by selecting the slide and pressing the command Hide slide. Also, you can use this option during exercising the timing of the slide

show by recording the show time. As for option (3), it helps and allows us to record and show slides with audio narration and laser pointer, and it also allows us to start recording from the beginning or from a specific slide. As for option (4), it works to show the controls of the audio and video clip while moving over it during the show, we can also use playback show to run the audio narration and determine the play time for the animations and timings during the show.

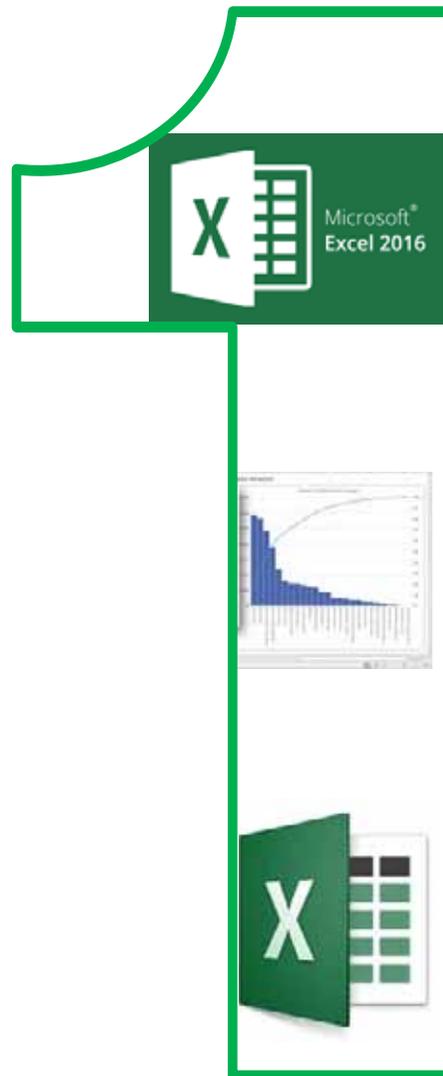
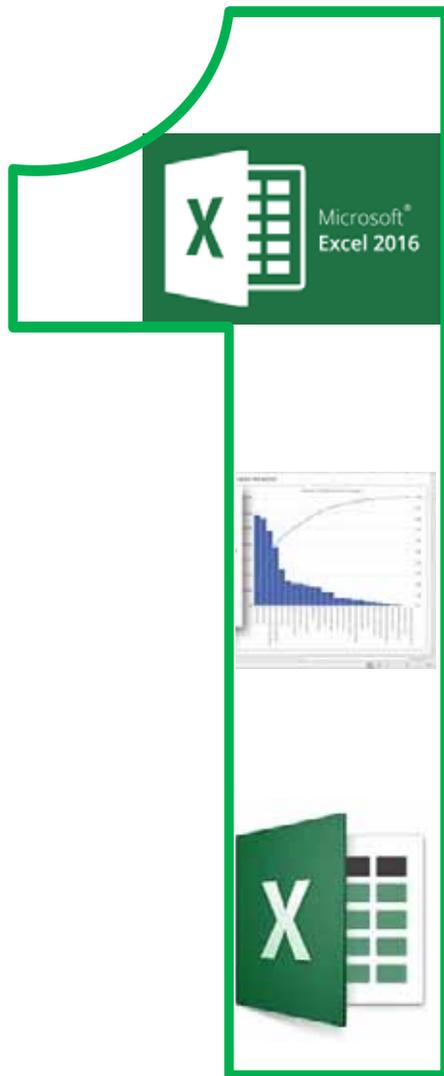
**3. The Monitors group:** This group has two options to be applied on the slide, as in Figure10 -44. In Option (1), the monitor allows us to automatically selection of the monitor or selection of a specific monitor. As for option (2), use presenter view, it allows us to show the slides in the full screen mode or the normal mode, or use the option (Alt + F5).





# Chapter 11

## Microsoft Excel







## Microsoft Excel

### Objectives

#### ➔ Main objectives:

1. Using the Excel worksheet program with high skill.

#### ➔ Secondary objectives

After studying this chapter, the student is expected to master the following knowledge and skills:

2. Learn how to insert data into cells.
3. Learn about keyboard utilizes on a sheet.
4. How to edit cell content.
5. How to find, replace and go to a specific location on the sheet.
6. Recognize ways to copy, move and delete cell contents
7. Learn how to sort cells in ascending or descending order
8. How to Freeze Panes.
9. How to use mathematical formulas and functions.
10. How to use arithmetic operations.
11. How to write formulas of arithmetic operations.
12. How to use the mathematical Functions Application.
13. Learn about ways to insert an image.
14. Learn to insert text.
15. Learn to insert automatic shapes.
16. Learn to insert chart.



### 11- 1 Introduction

In this chapter we will review number of skills that a student can learn to be able to use Microsoft Excel 2016 or what is known as the excel worksheet program, and all of these skills are only related to Microsoft Excel 2016. One of the most important things that the student must learn in this chapter is to know the new features of Microsoft Excel 2016, how to work with its interface, use and edit worksheets, and work with the document as a whole. It is also necessary to master dealing with various mathematical data and formulas, as well as dealing with objects, diagrams, and charts.

### 11 -2 Microsoft Excel

The Excel worksheet program (Microsoft Excel) is considered one of the Microsoft office programs, and it is specialized in creating Excel worksheets, as it provides a set of many features that makes the process of creating and editing excel worksheets and their display method is unique so that any user can apply it. Microsoft Excel 2016 is the 15th edition. It is also considered one of the effective programs in the electronic table, whereby it is possible to create, delete and edit cells so that they appear sequentially, automatically or interactively, with the addition of animations and sound effects accompanying the animation. Also, the Excel program used enables the user to share files with others. Also, it is possible to save editable file with Excel format, or an automatic display to run it without an Excel program on the computer. It also allows easy handling of graphs and faster.

### 11 -3 Design Features Using Excel

Many of us are looking to learn programs that help them organize mathematical data, and some even buy programs at expensive prices and sometimes, they discover that the program they bought does not fulfill the purpose. So, we find that sometimes Microsoft Office Excel package programs make you do not need to other computations programs.

#### *The most important features of Microsoft Office Excel 2016 are:*

- It is possible to calculate the income and expenses of a specific company efficiently.
- Analyze data and display the data to the user in the desired form.
- Create calculations that clarify the status of the institution or company.
- We do not need to go back to calculations once graphs have been created and data can be saved, arranged and restored at any time.

- The program works to reduce the time in calculations. Once a single cell is calculated, you can apply the first calculations to the rest of the cells by dragging the left mouse button and from the box in the rightmost corner, which gives speed in the calculations.
- The use of the program enables you to insert data that may take time to write down.
- The program manages the tables and we can copy and paste the cells efficiently.

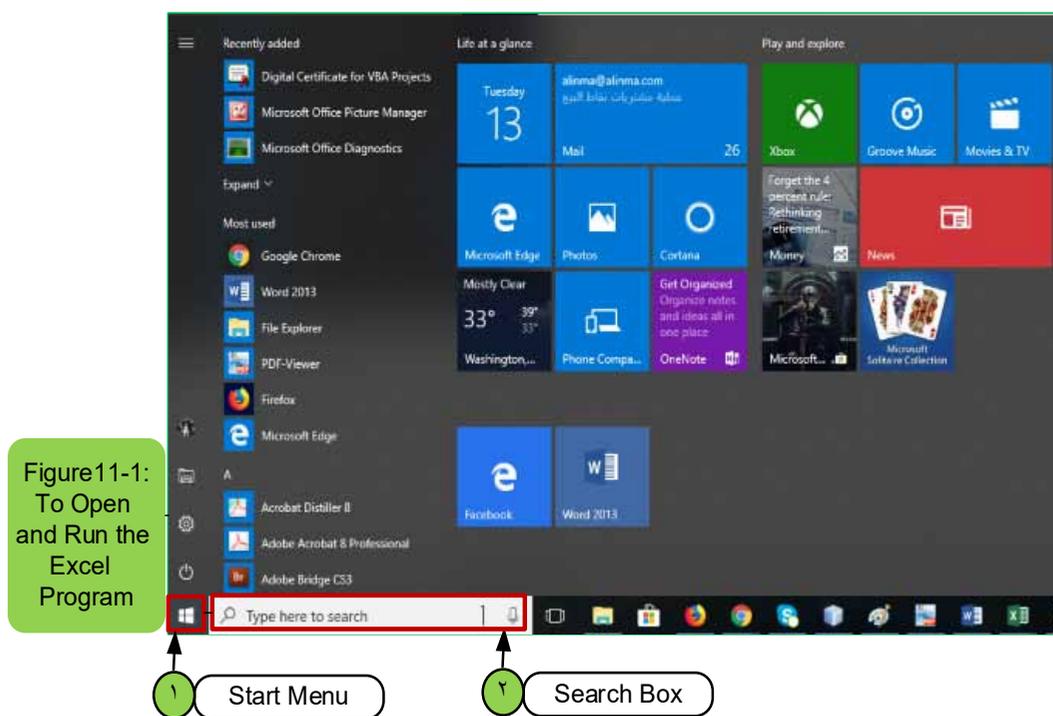
**Skill 11 - 1**  
Learn How to Create, Open and Close Excel worksheet Program



### 11 -4 Create, Open, and Close Excel Worksheet Program

*To open and run the Excel Worksheet program, follow these steps:*

- From the Windows 10 Start menu: Click the left mouse button on the Windows icon, as shown in Figure 11 -1.
  - Click on All Programs as in Figure 11- 1
  - Then enter the application software and search for Excel 2016
- By typing directly into the Excel 2016 search box and then pressing the left mouse button for Excel to open.



- Or from the desktop by pressing the right mouse button on a free space of the desktop and then choosing New then the Microsoft Excel Worksheet program or Excel.

After opening the Microsoft Excel program, the main program dialog box will appear as in Figure 11 -2, where it can create a new workbook file, use an existing Excel file, or use a ready workbook.

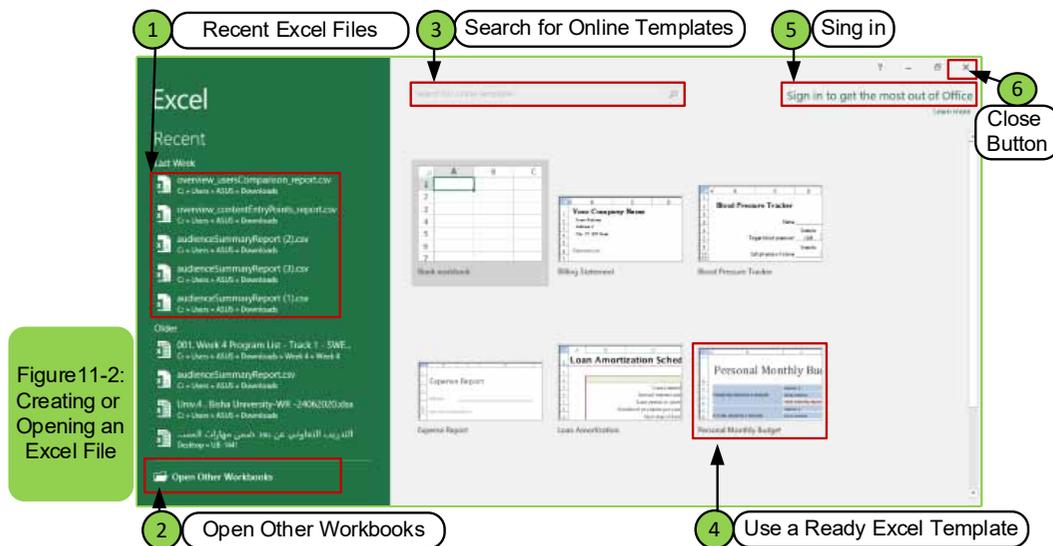


Figure 11-2:  
Creating or  
Opening an  
Excel File

## Skill 11 - 2

### Learning How to use the Main Interface of Microsoft Excel 2016



### *The main user interface for Microsoft Excel 2016*

Before you start working with Microsoft Excel 2016 program, you must have the ability to know the main user interface for this program, and we find that once you open the Excel worksheet program (Excel) and choose the workbook, the figure 113- will appear. Also, the main user interface contains several tabs and inside each tab there are number of groups and inside each group there are number of options and the most used tabs in the Microsoft Excel 2016 program are:

- File tab
- Home tab
- Insert tab
- Page Layout tab
- Formulas tab
- Data tab
- Review tab
- View tab

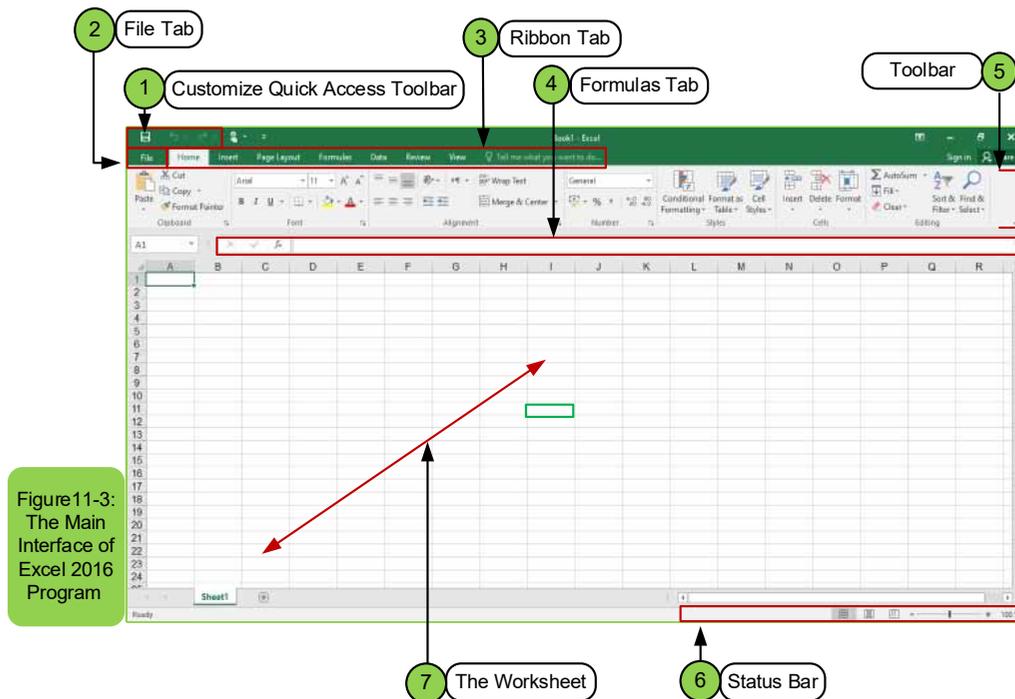


Figure 11-3:  
The Main  
Interface of  
Excel 2016  
Program

The main workbook of Excel worksheet after opening it contains several components as in Figure 11 -3, and we can mention:

1. **Customize Quick Access Toolbar:** The Quick Access Toolbar can appear above or below the bar. In order to change its location, click on the drop-down arrow to the right of the toolbar and click on (Show Below the Ribbon). Also, through this toolbar the user can open a new document or save or print a file and there are also other options inside it.
2. **File Tab:** it enables the user to open a new workbook, print, save a file, or open an existing file inside the computer or in one of the storage media.
3. **Ribbon Tab:** By default, in Microsoft Office Excel 2016 there are more than ten tabs (except for the File menu). Sometimes you will see editing tabs that appear when working on a special type of object.
4. **FormulasTab:** It is a bar next to the name box, in which the user can write the appropriate mathematical formula that he/she wishes to perform, and it also shows the content of the active cell.
5. **Toolbar:**It contains number of options that enables searching, replacing, selecting, editing, and others.
6. **Status Bar:** It is the bar through which the workbook screen is enlarged and minimized. Another option is to go to the view tab and choose the option zoom in or out according to what you need.

**7. The worksheet:** It is the region that consists of several rows and columns and their intersection with each other is called a “cell”, and the cell is activated by clicking on it as in the above figure and the active cell is surrounded by a green frame so we find from the figure above the H5 cell surrounded by the green frame and now we find the name H5 is obtained from that the letter H represents the column and the number 5 represents the row.

- The main user interface in the Excel program after opening allows us to create another new workbook by going to the "File" menu and clicking the left mouse button on the "New" option and then we choose "Blank workbook" or we can directly press the keys (Ctrl + N).
- To open an existing Excel file, we click on the “File” menu and click on the “Open” option. The options in Figure 114- appear to us, or we can press the keys (Ctrl + O).

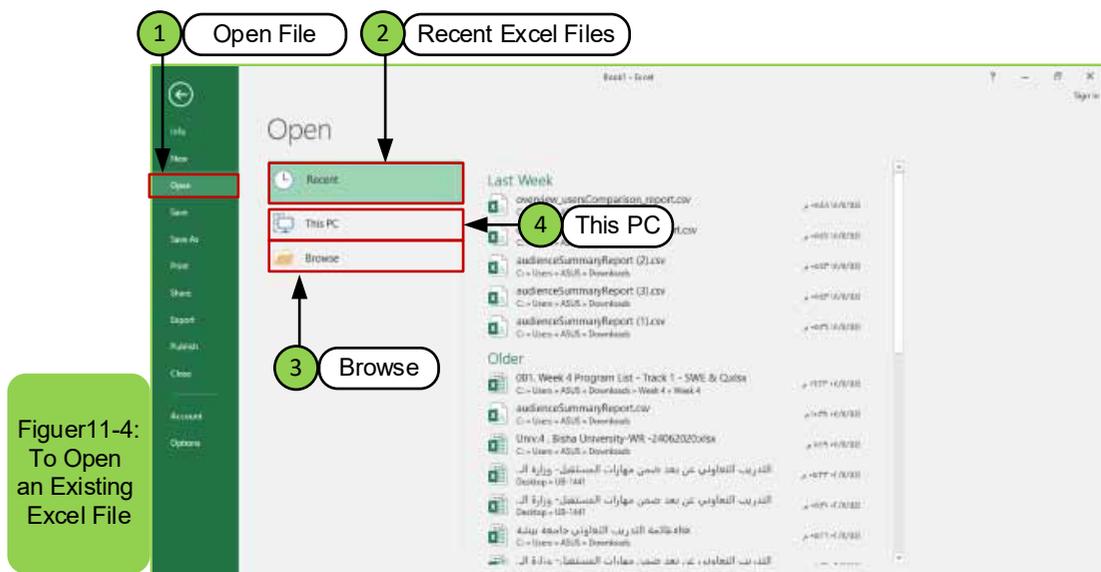
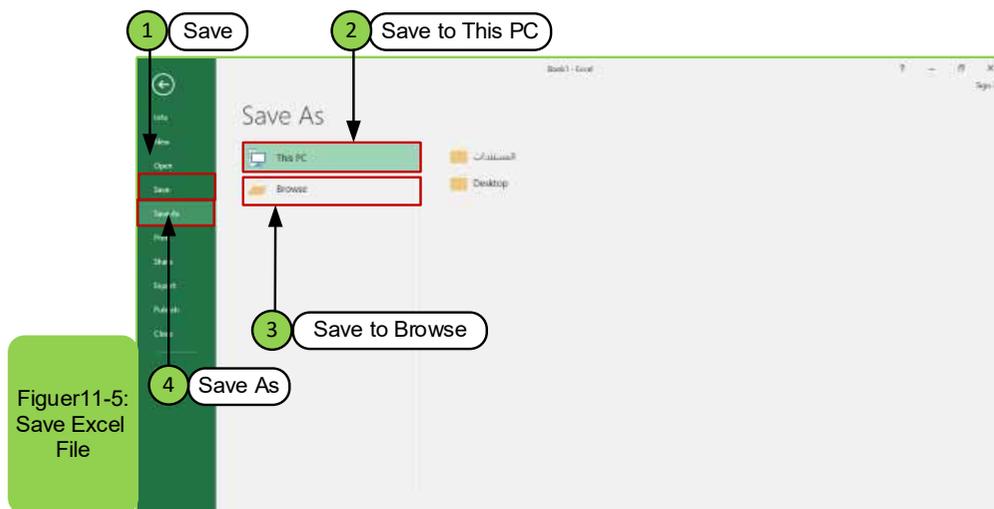


Figure 11-4:  
To Open  
an Existing  
Excel File

- To save a file for a new workbook in the Excel worksheet program, there are two methods, as in Figure 11 -5:
- 1. The first method “Save”:** Click on the “File” menu and choose the “Save” command, and this option is used to save a new workbook or in the case of saving the updating that was made to the opened workbook. We can also press Ctrl + S to perform the command directly.
  - 2. The second method “Save As”:** allows us to save a new copy or save another copy of the workbook while keeping the original.



Figuer11-5:  
Save Excel  
File

- To close the excel worksheet program, click the left mouse button on the "X" icon in the top right of the open window, which closes the file or by using the shutdown keys (Alt + F4).

### Skill 11 - 3

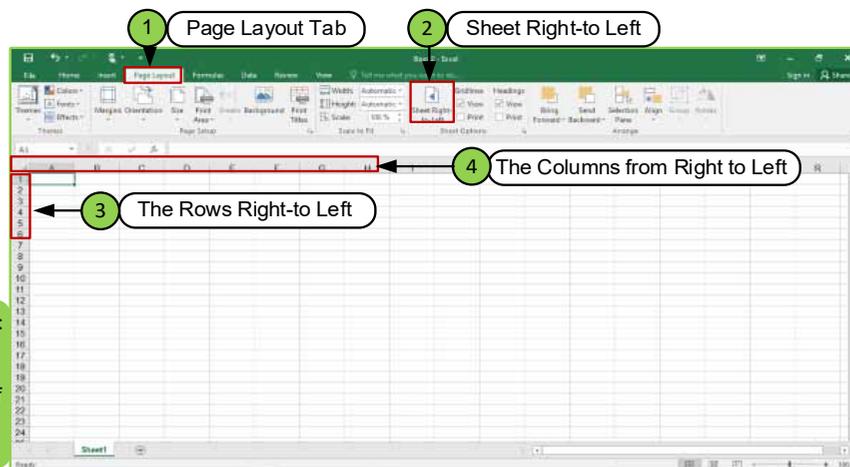
Recognizing How to Change the Direction of the Worksheet from right to left or vice versa



### 11 -6 Changing the Direction of Worksheet in Excel Program

We find that when a new workbook is opened in the Excel program, the worksheet direction will be from left to right, this means that the rows and columns will be from left to right, so the following helps the worksheet's users in the English language. In the case of the need that changes the direction of the worksheet from right to left so that users of the Arabic language can apply it as in Figure116-, we follow the following:

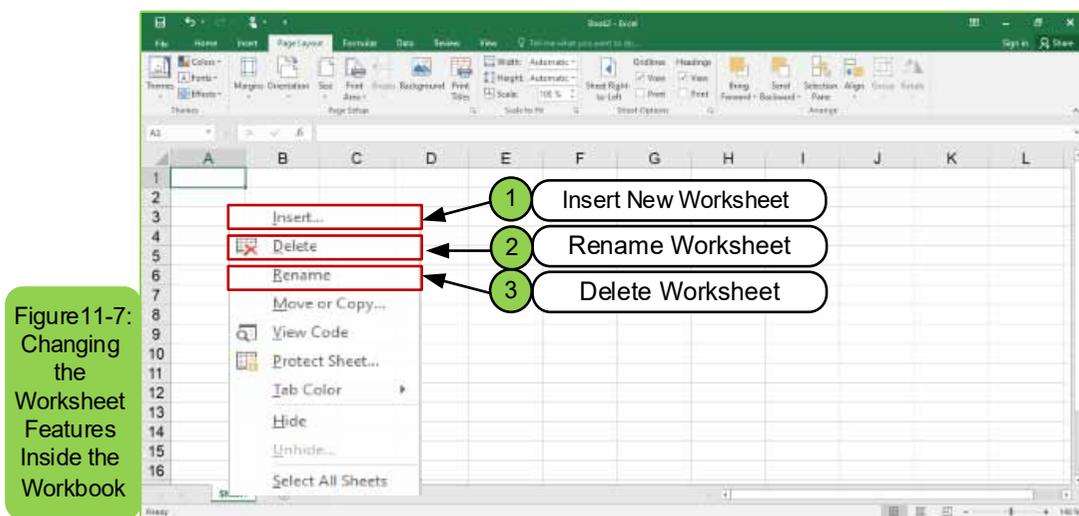
- Go that "page layout" tab
- Click on the "Right to Left Sheet" option to change the direction of the worksheet from right to left.



Figuer11-6:  
Changing  
the  
Direction of  
an Excel  
Workbook

### 11 -7 Changing the worksheet features inside the workbook

We find that when opening a new workbook at the beginning, it contains one worksheet called “Sheet1”, so the Excel program allows us to change the name of the sheet to the name we want, add other worksheets, or delete worksheets and this is done as the following we stand at the “Sheet 1” option below The worksheet then we press the right mouse button, and a drop-down menu appears containing several options and we choose from it the option that we want to apply as in Figure 11- 7.



**Skill 11 - 4**  
Recognizing How to Deal with Cells, Rows and Columns



### 11 -8 Dealing with Cells, Rows and Columns

As we mentioned earlier, the intersection of any Column with Row gives a Cell. In this section, we will know the following as in Figure 11 -8:

- How to select (select) a cell and this is done only by clicking with the left mouse button on the cell we want.
- How to select number of adjacent cells, by clicking the left mouse button on the first cell and then dragging the mouse pointer to the last cell and then the cells have been selected. We find that the mouse pointer is pulled in the direction of the row. This means that we have pulled cells that are adjacent to a row. As for pulling the pointer in the direction of the column, this means that we have selected vertical adjacent cells.
- Also we can select row and vertical adjacent cells at the same time by selecting the first cell and pressing the "Shift" key on the keyboard and

dragging the mouse pointer at the same time and then clicking on the last cell with the left button of the mouse.

- As for the need to select spread out cells, we press the "Ctrl" key and then at the same time choose the cells that you want to select by clicking on the left mouse button in the cell you wish to choose.

**Note:** To insert text or number into the cell, this is done by selecting the cell in which we want to insert the text or number by clicking on it with the mouse, and then we write the text or number directly as in Figure118- and we can move through the cells using the arrows on the keyboard.

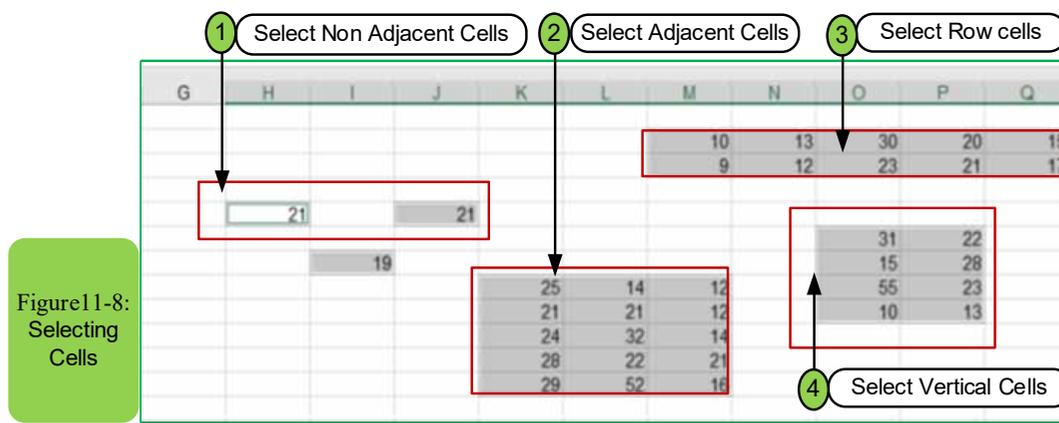


Figure11-8:  
Selecting  
Cells

### Skill 11 - 5 Recognizing How to Delete Cells, Rows, Columns and Worksheets



#### 11- 8 -1 Delete Cells, Rows, Columns and Worksheets

Sometimes the user of excel worksheet program may need to delete a row, column, or worksheet, or he may need to move some cells to the right or to the left, or from top to bottom or vice versa. To apply these commands, the following steps can be followed:

- Determine the cell or cells to be deleted by left-click.
- From the "Home" tab, click on the "Delete" icon at the top of the sheet, as in Figure 11- 9, and then several options for deletion appear.

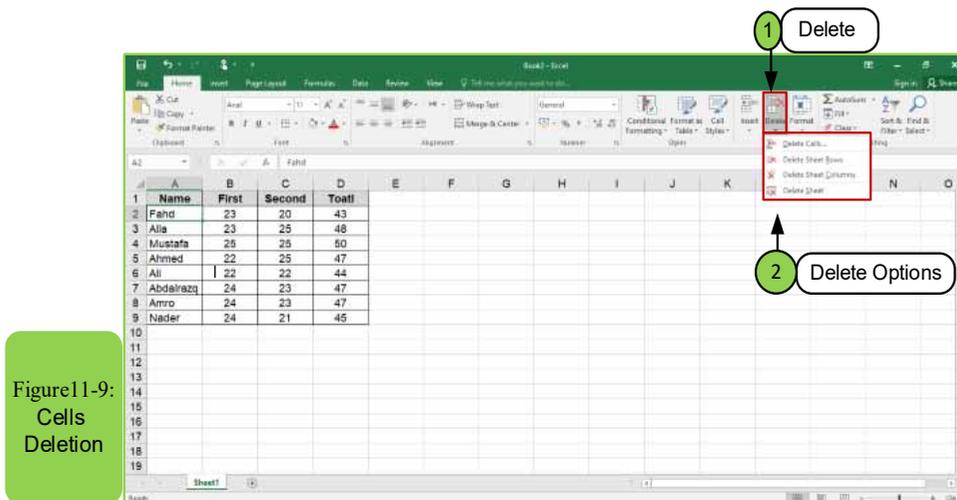


Figure11-9:  
Cells  
Deletion

- When you click on the "Delete" option, four options will appear, namely, delete cells - delete sheet rows - delete sheet columns - delete sheet:
- In the case of clicking on the "Delete Cells" option after selecting the cells, the dialog box appears as in Figure 11 -10 which has four applicable options and when choosing any of them press "OK" to apply.

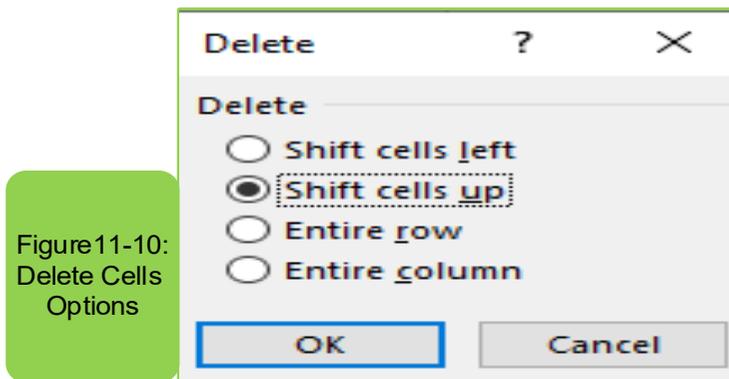


Figure11-10:  
Delete Cells  
Options

- If you press the "Delete Sheet Rows" option inside the "Delete" option located on the "Home" tab, the selected rows will be deleted automatically.
- If you press the "Delete Sheet Columns" option inside the "Delete" option located on the "Home" tab, the selected columns will be deleted automatically.

**Note:** There is another way in which you can delete rows, columns, or cells by:

- Determine the rows, columns, or cells you want to delete directly.
- Clicking the right mouse button and choosing "Delete" from the menu that appears as in Figure 11- 11.

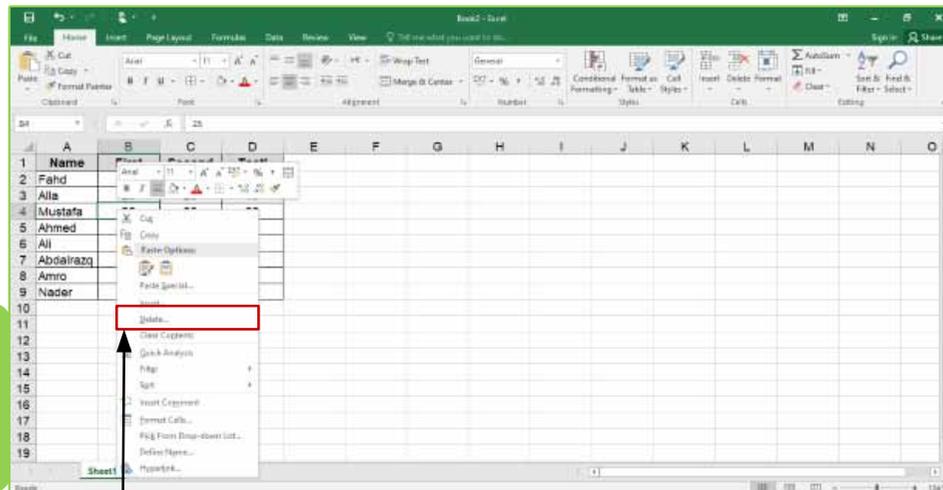


Figure 11-11:  
Delete from  
Drop Menu

1 Delete

- We find that the last option in the "Delete" menu is "Delete a sheet". If you click on the "Delete a sheet" option, as in Figure 119-, you will see a message explaining that to delete the current worksheet, the workbook must contain more than one worksheet. The deletion cannot take place if there is only one worksheet as in Figure 11- 12.

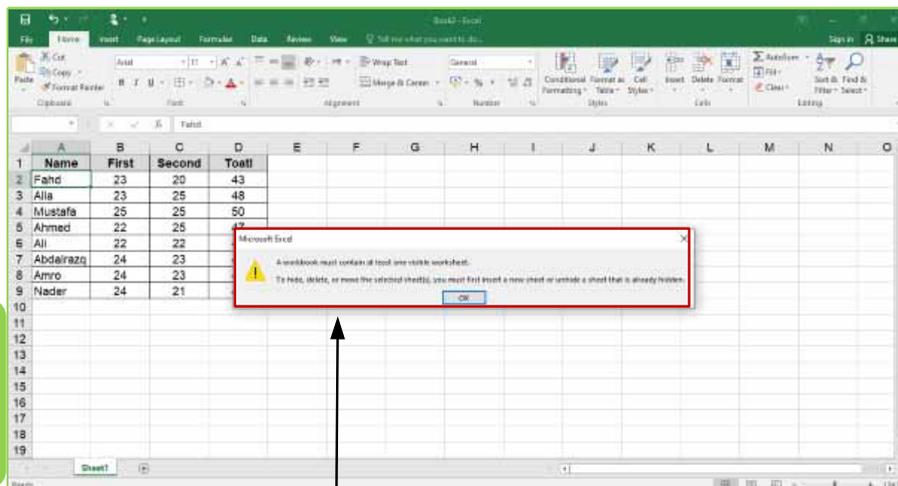


Figure 11-12:  
A Sheet  
Deletion  
Message

1 A Sheet Deletion Message

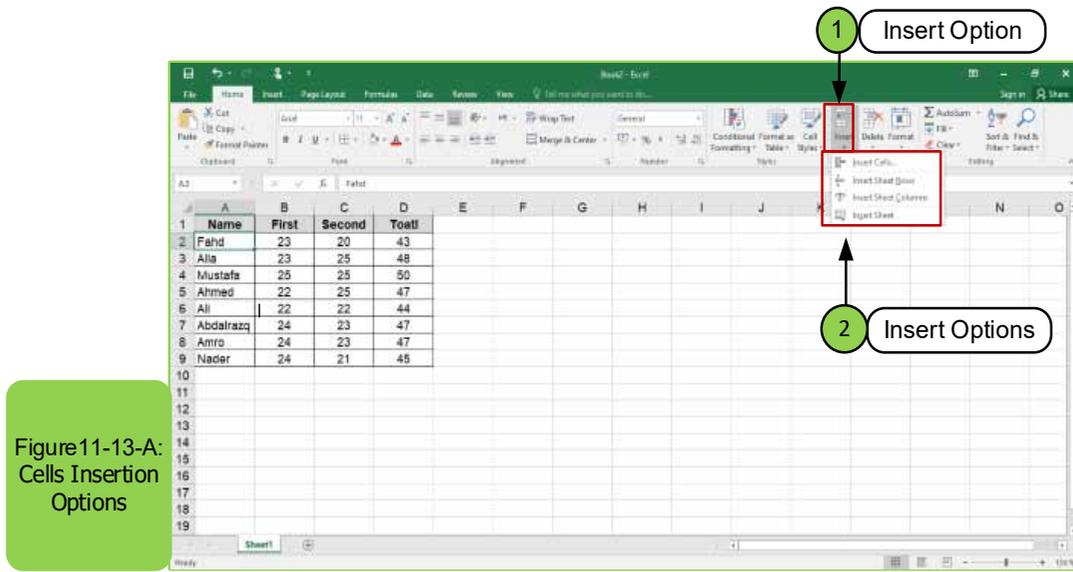
### Skill 11 - 6 Recognizing How to Insert Cells, Rows, Columns and Worksheets



#### 11 -8- 2 Insert Cells, Rows, Columns and Worksheets

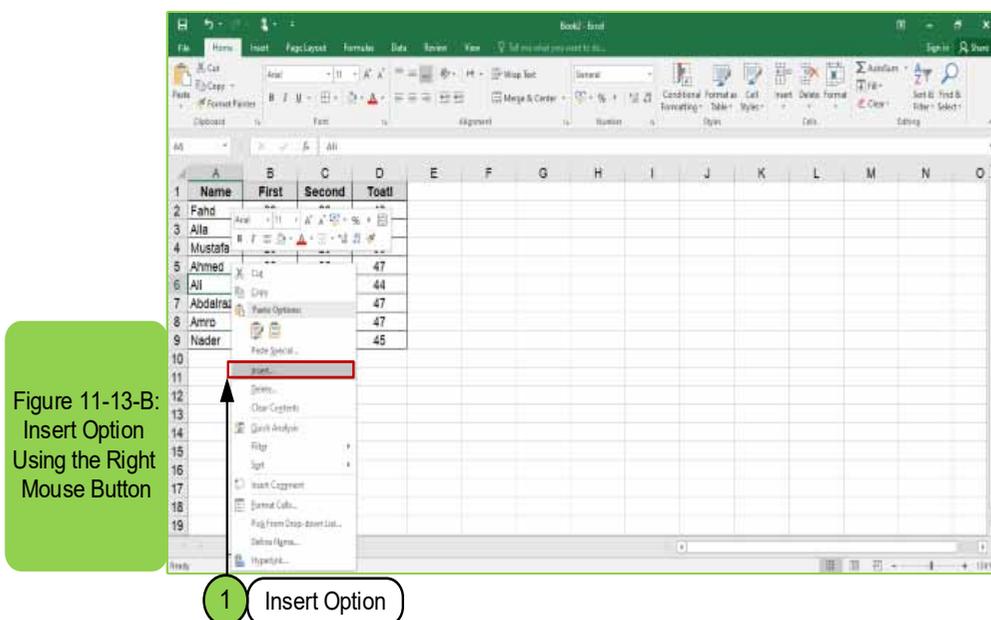
Sometimes user of the Excel worksheet program may need to insert a row, column, or worksheet into the currently open workbook. In this case, the user must follow the following steps:

- Select the cell or cells to insert cells before or after by clicking with the left mouse button.
- From the "Home" tab, we click on the "Insert" icon at the top of the sheet as in Figure 11- 13-A, so several options for insert will appear as soon as we choose any of the four options.
- The selected option will be performed directly.



**Note:** There is another way in which you can insert rows, columns, or cells by:

- Determine the rows, columns, or cells you want to insert directly.
- Click the right mouse button and choose "Insert" from the menu that appears as in Figure 11- 13-B.



## Skill 11 - 7 Recognizing How to Change the Sheet Name



### 11 -8 -3 Change the Sheet Name

Sometimes the user of the Excel worksheet program may need to change the name of the sheet to another alternative name, and this is done through one of two options:

- 1. The first option:** by double-clicking on the name of the sheet whose name we want to change then we write the new name and press Enter.
- 2. The second option:** we right-click on the name of the sheet whose name we want to change and then a menu appears containing several options we choose the option "rename" and then we change the name and click Enter as in Figure 11 -14 or click the left mouse button to complete the editing.

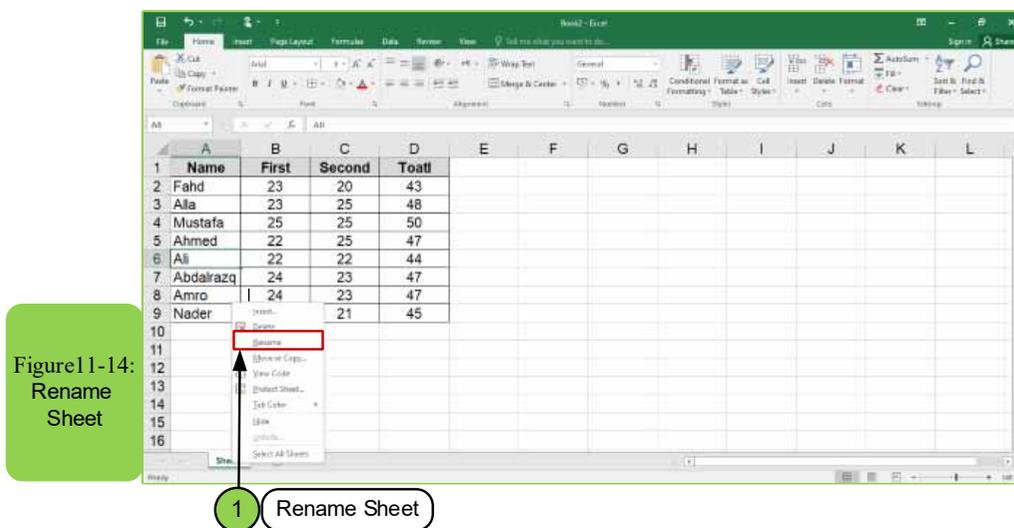


Figure 11-14:  
Rename  
Sheet

1 Rename Sheet

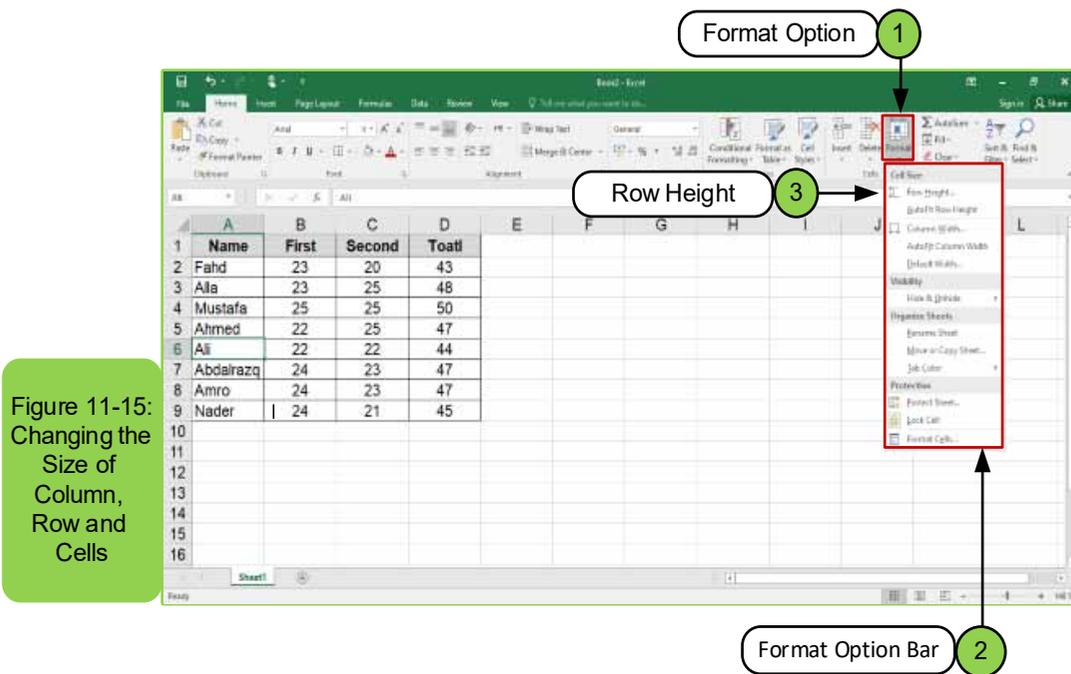
## Skill 11 - 8 Recognizing How to Change the Size of Column and Row



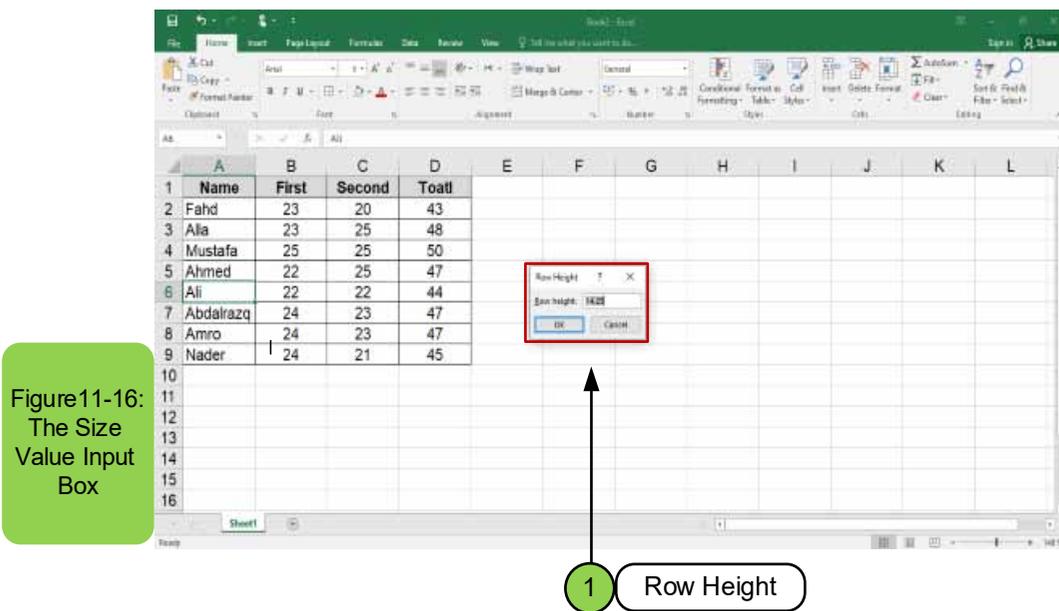
### 11- 8 -4 Adjusting the Size of Column and Rows

Sometimes the user of the Excel worksheet program may need to change the size of a specific row or rows and enables him to adjust the size of a specific column or columns by the following:

- We click on the row, column, or cell we want to resize.
- From the "Home" tab, we click on the "Format" option at the top of the screen, and the menu appears to us as in Figure 11 -15.



- **To change the size of the row,** we choose from the list that appeared when clicking on the “Format” option, the option “Row height” as in Figure (11- 15). A box will appear to us, as in Figure 1116-, through which we specify the size that we want to give then we press the “OK” button to apply.



- **To change the size of the column,** we choose from the list that appeared when clicking on the “Format” option, the option “Column width” as in Figure 11- 17. A box appears to us through which we specify the size that we want to give, then we press the “OK” button to apply.

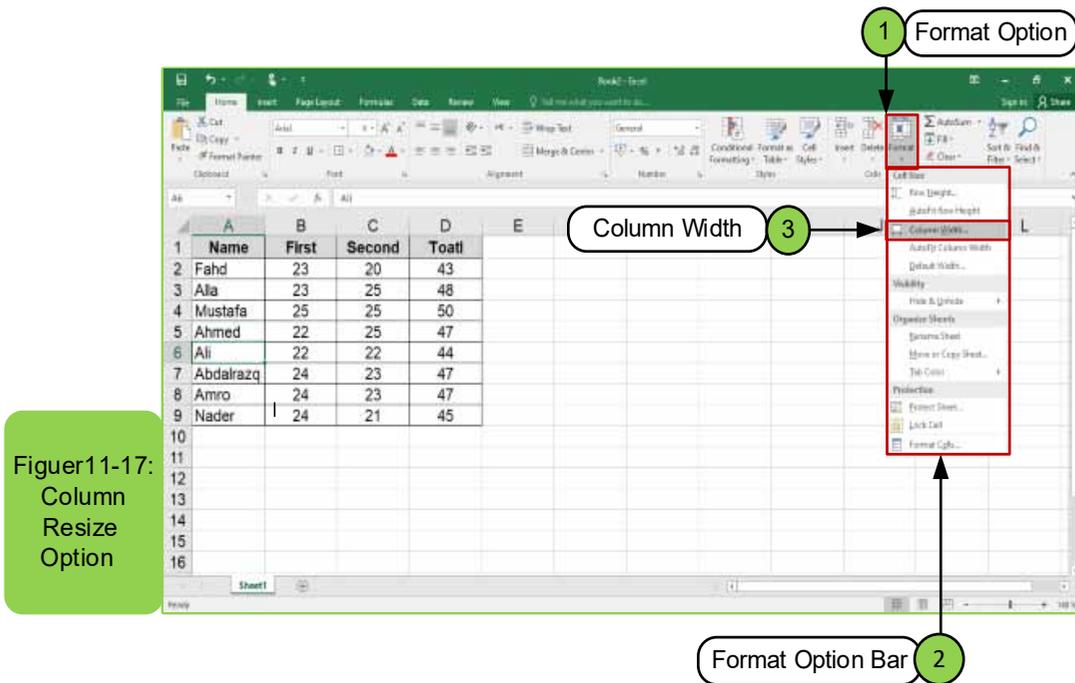


Figure 11-17:  
Column  
Resize  
Option

**Note:** There is another way in which you can adjust the size of the rows or columns as follows:

- Determine which rows or columns we want to enlarge or reduce.
- We click on the left mouse button at the beginning of the row or column and then drag according to the desired size as in Figure 11- 18.

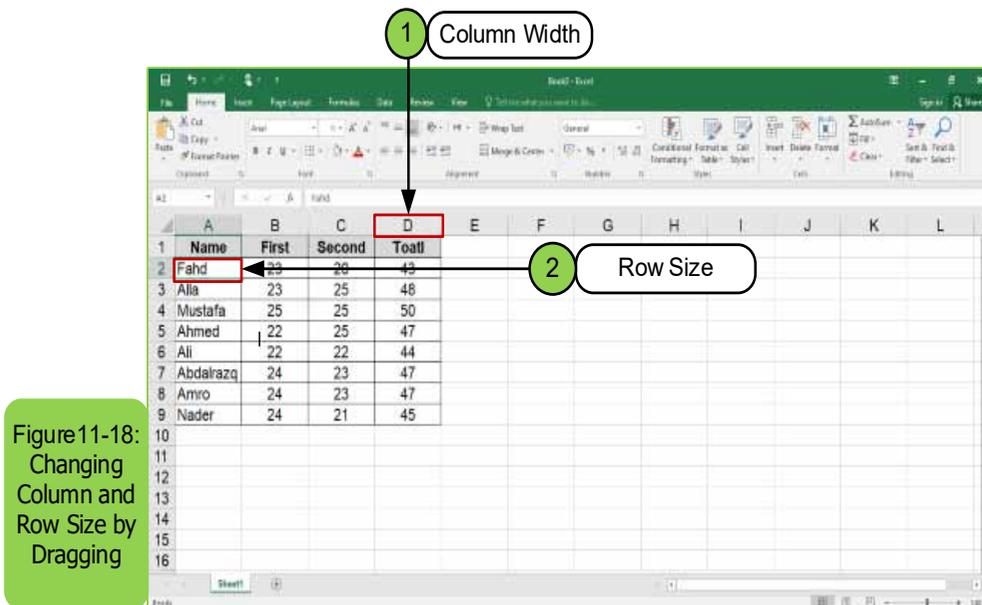


Figure 11-18:  
Changing  
Column and  
Row Size by  
Dragging

## Skill 11 - 9 Insertion of Cell Data



### 11 -9 Insertion of Cell Data

Data for each of (numbers, texts, dates) can be inserted into cells - as in Figure 11- 19 - by the following steps:

- To select the cell to be written on: Click the left mouse button on it or use the keyboard to access it.
- Write the text, number, or date directly in the box. The date is usually written in the form of (day / month / year).
- Press Enter to fix the data and move to the next cell.

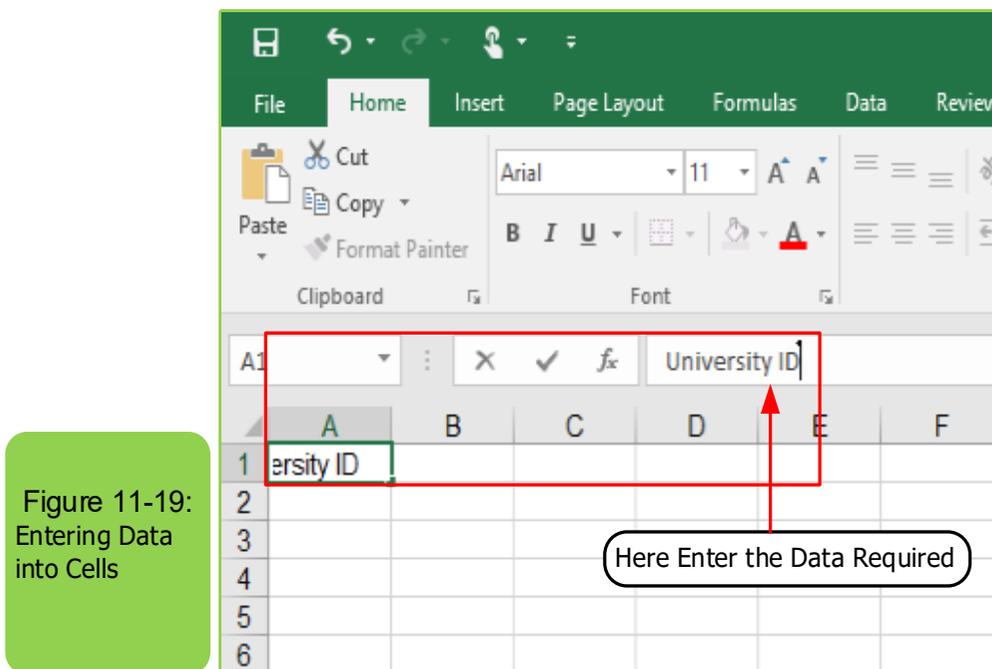


Figure 11-19:  
Entering Data  
into Cells

**For example, to insert the following data:**

University ID	First Name	Last Name	Specialization
1017891	Mohammad	Khaled	Computer Science
1027892	Moustafa	Majid	Information Technology
1037893	Ali	Othman	Information Technology

**Follow the following steps:**

- Click on cell A1 and then it will select.
- Type the phrase (university ID) using the keyboard.
- Click on cell B1 and type (first name).
- Click on cell C1 and type (last name).
- Click cell D1 and type (specialization).
- Click on cell A2 and type (1017891).
- Click on cell B2 and type (Mohammad).
- Click on cell C2, and type (Khaled).
- Click on cell D2, and type (Computer Science).
- Repeat the previous steps to fill in the rest of the table as in Figure11 -20.

	A	B	C	D
1	University ID	First Name	Last Name	Specialization
2	1017891	Mohamed	Khalid	Computer Science
3	1017892	Ahmed	Nader	Information Technology
4	1017893	Osman	Ahmed	Information Technology

Figure11-20:  
Cell Data  
Entry Form

**11 -9- 1 The use of the keyboard on a worksheet:**

- To move to a new row below the current row press (Enter)
- To move to a new column to the left of the current press (Tab)
- To delete a cell’s content: Select the cell’s content by clicking on it and then clicking (Delete).
- To go to the beginning of the line / row, press (Ctrl + Home)
- To move to the end of the line / row, press (Ctrl + End)
- To move to the beginning of the worksheet, press (Ctrl + Home)
- To view the rows down, click (Ctrl+Page Down)
- To view the rows up click (Ctrl+Page Up)
- To undo any error, press (Ctrl + Z)
- To return to the undone, press (Ctrl + Y)

### 11 -9 -2 General rules for inserting the data

- From the figure, note that one element was inserted in cell A1 as a number only and also for cell B1, and it is preferable to insert data in cells in this way; because this later allows us to perform sorting operations easily for the first name only or for the date modified and the contents of cells (A1, B1, C1, and D1) are called from field or column headings.
- If you want to insert new data, insert it in the fourth row directly, and do not leave blank rows between the data because this may cause future errors when performing the data sorting, as well as for the columns.
- If you determine the sum of the numerical data for a column, for example, it is preferable to leave a blank row before the row in which the sum will be inserted.
- To insert a specific number, select the cell and type the number directly in it. A negative sign can be inserted in front of the number if the number is negative.
- Use the slash (/) or the hyphen (-) to separate the components of date. To enter the current date in a specific cell, press (Ctrl + ;) on the keyboard.
- To insert the current time, press (Ctrl + :), i.e. (Ctrl+ Shift + ;) on the keyboard.

### Skill 11 - 10 Recognizing How to Edit the Cell Content



### 11 -9- 3 Editing the Cell Content

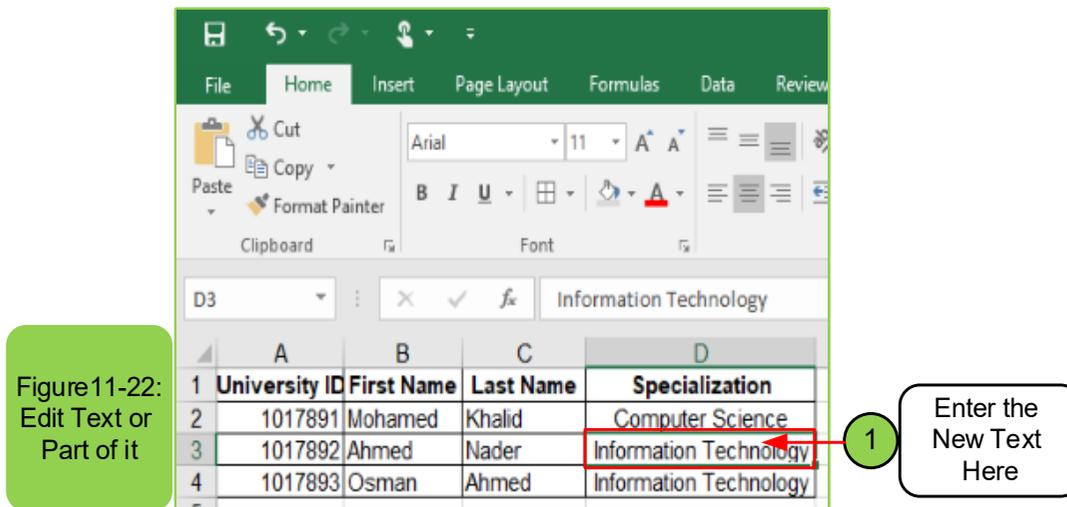
*To edit the cell contents with (add, delete, replace), follow these steps:*

- Click on the cell whose content you want to edit, for example cell (D3) as shown in Figure 11 -21.

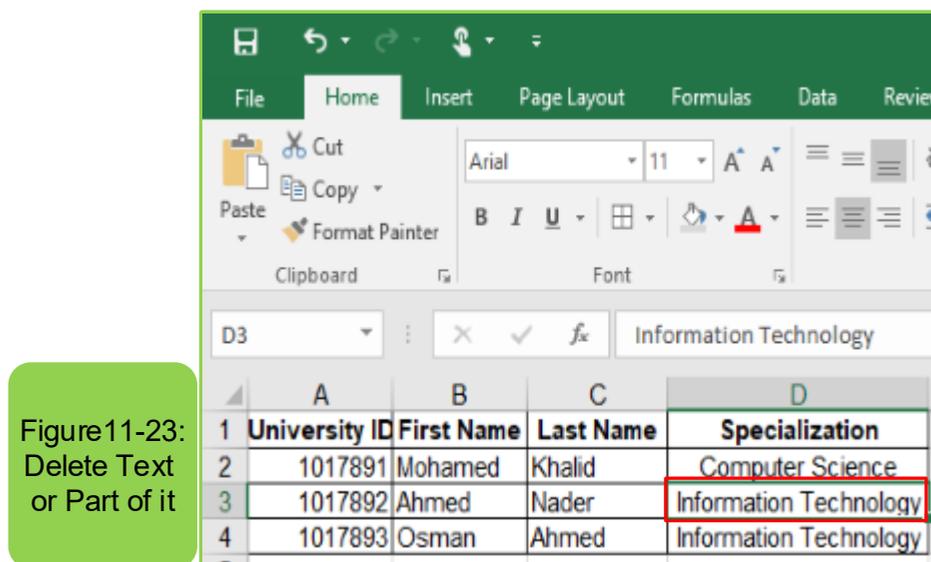
Figure 11-21: Modifying Cell Data

	A	B	C	D
1	University ID	First Name	Last Name	Specialization
2	1017891	Mohamed	Khalid	Computer Science
3	1017892	Ahmed	Nader	Information Technology
4	1017893	Osman	Ahmed	Information Technology

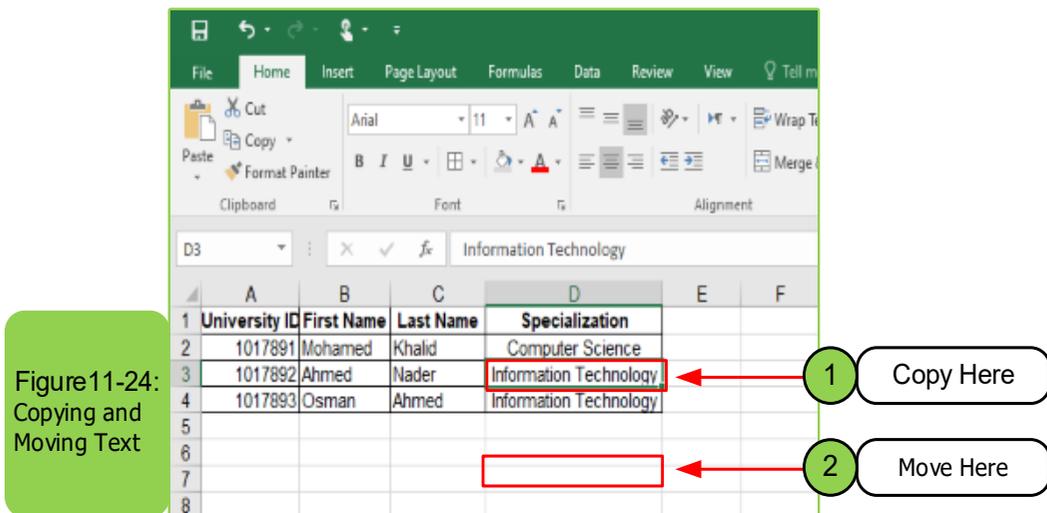
- **To add data:** Move the pointer to the addition site, then start adding (text or number ...) you want to add directly.
- **To edit the text (or part of it):** Select the text to be replaced by highlighting it with the mouse, insert the new text directly as shown in Figure 11- 22.



- **To delete the text (or part of it):** Select the text to be deleted by highlighting it with the mouse, press the “Delete” key as shown in Figure 11- 23.



- **To copy or Paste the text:** Select the text to be replaced by highlighting it with the mouse, press (Ctrl + C) to copy or (Ctrl + X) to cut, then go to the second cell site and press (Ctrl + V) to paste as shown in Figure 11-24.



## Skill 11 - 11

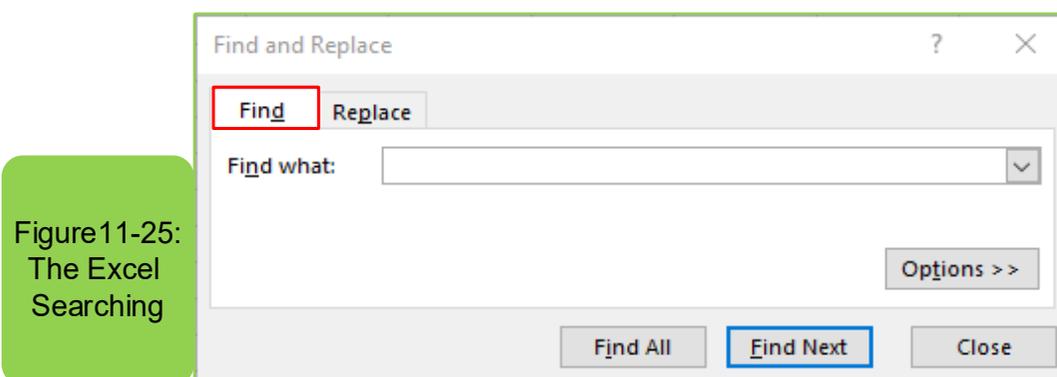
### Recognizing How to Find, Replace and Go to

### 11 -10 Find, Replace and Go to

#### 11 -10 -1 Find

*Excel worksheet program enables you to search for text or number contained within the texts of worksheet cells, to search follow the following steps:*

- Within the tab (Home) and from the group (Editing), click on the (Find and Select) icon and the Find and Replace dialog box appears, or press (Ctrl + F) on the keyboard, so that the Find dialog box appears directly as shown in the Figure 11 -25.



- Find and Replace dialog box, select the (Find and Select) command, and the find dialog box appears.
- In the (Find what) edit box, type the data you want to search for such as (.....) as in Figure (11- 25)

- Click the (Find Next) button and note that the pointer moves directly to the first position of data on the worksheet.
- Repeat clicking the (Find Next) button, and the pointer will move to other places that contain the data as shown in Figure1126-.
- Click the (Close) button to close the (Find and Replace) dialog box.

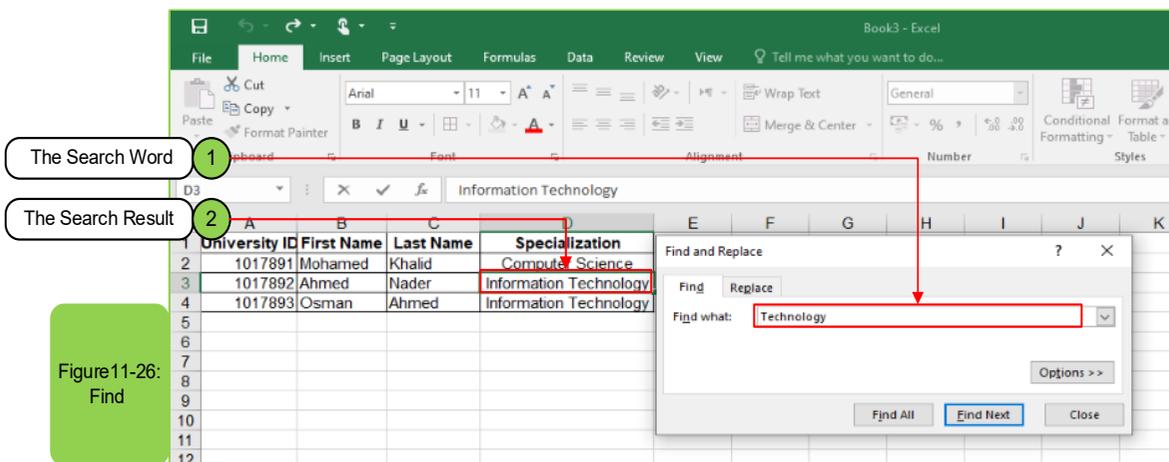


Figure11-26:  
Find

### 11 -10- 2 Replace

The excel worksheet program enables you to replace the value with a new value on the worksheet. To make the replacement, follow these steps:

- Apply step (1) above in the find process.
- Click on the (Replace) tab instead of (Find).
- Perform step (2) by typing the value you are looking for and the replaced value.
- Click the Replace button to replace the value in its location, or (Replace All) to replace all the contents of the worksheet similar to the replaced value as shown in Figure11 -27.
- Click the (Close) button to fix the replacement, then close the dialog box.

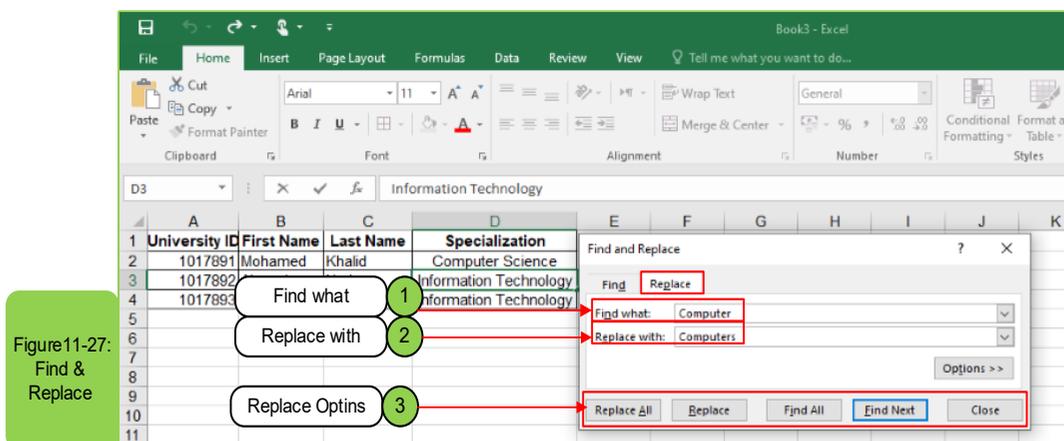


Figure11-27:  
Find &  
Replace

### 11 -10 -3 Go to

The (Go to) command is used to quickly reach cells, columns, or rows, rather than searching and moving between columns and rows to reach the desired one.

#### To move to a specific cell, follow these steps:

- On the (Home) tab and in the (Edit) group, click the (Find and Select) icon and then click (Go To) or press (Ctrl + G) to show the (Go to) Dialog box or press the (F5).
- Type in the cell number required to go to, for example (D1), then click the OK button.
- You will immediately go to the desired cell.
- To return to the beginning of the worksheet you can follow the same previous steps and insert the cell name (A1), or press (Ctrl + Home) as shown in the Figure11- 28.

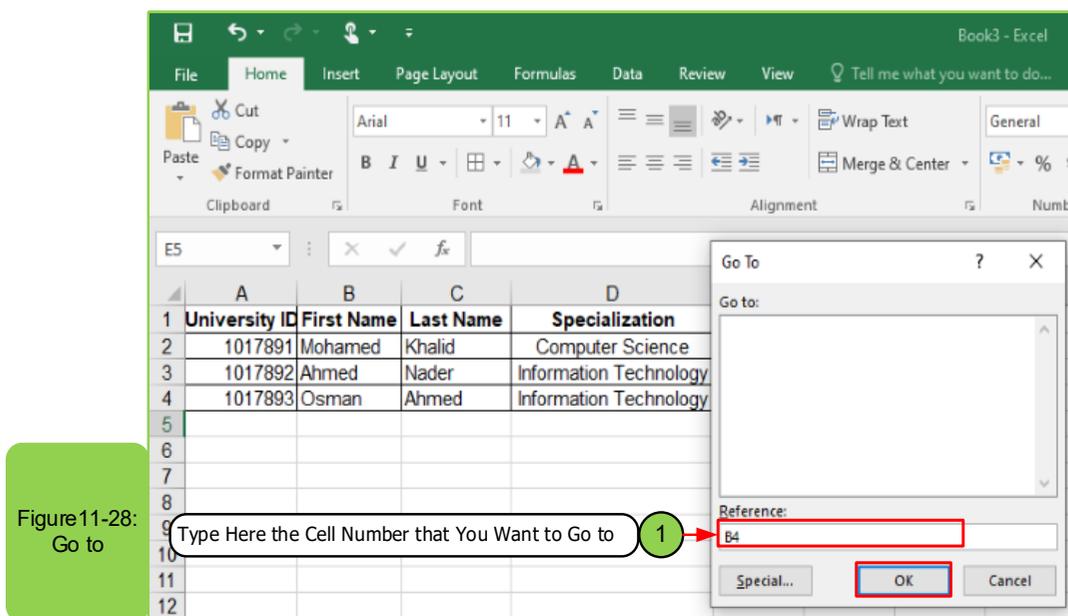


Figure11-28:  
Go to

Type Here the Cell Number that You Want to Go to

### Skill 11 - 12

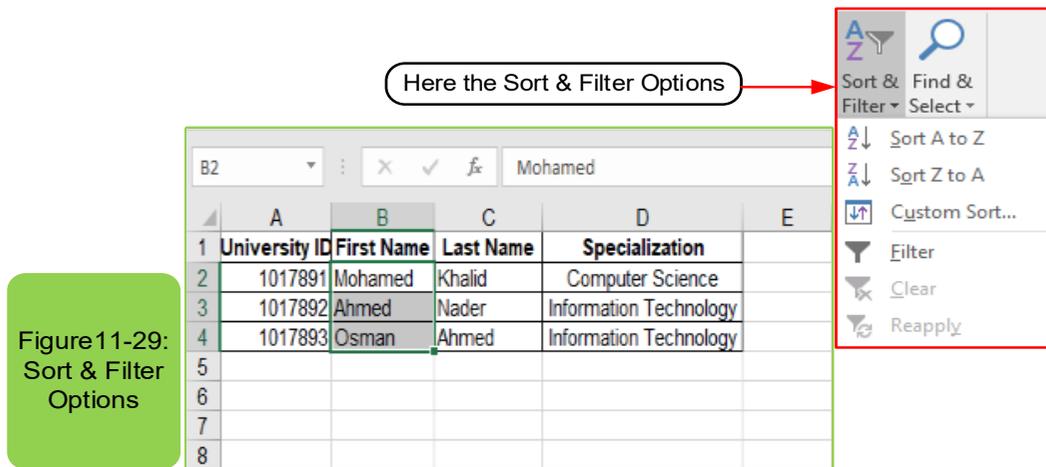
Recognize the Sorting of Cells ascendingly or descendingly



### 11 -11 Sorting cells ascendingly or descendingly

The excel worksheet program enables you to sort the data of columns either ascendingly or descendingly, either alphabetically (A..Z) or digitally (9..0) by following the following steps:

- Select the cells of the column to sort the data on (with necessary to not highlighting the headers of the columns).
- To sort: Click on the “Sort” button in the “Edit” group of the “Home” bar, to display a set of options as shown in Figure 11 -29.



- **For Ascending Sorting:** Click on the (Ascending Order) option.
- **For Descending Sorting:** Click (Descending Order).

To sort all the contents of the rows according to the order of the values (ascending / descending) in the required column as shown in Figure 11 -30.

### Skill 11 - 13

#### Recognizing the Freeze Panes

### 11- 12 Freezing Panes

The word “freezing” means fixing number of cells so that they do not move or disappear from the user’s sight even if the sheet is moved up and down, as well as to the left or right, and the process (freezing) can be carried out by following the following steps:

- Click on the cell you want to freeze the panes starting from it.
- Click the (Freeze Panes) button within the (window) group of the (View) tab to give options (Freeze Top Row, Freeze First Column, Freeze Panes)as shown in Figure1130-.

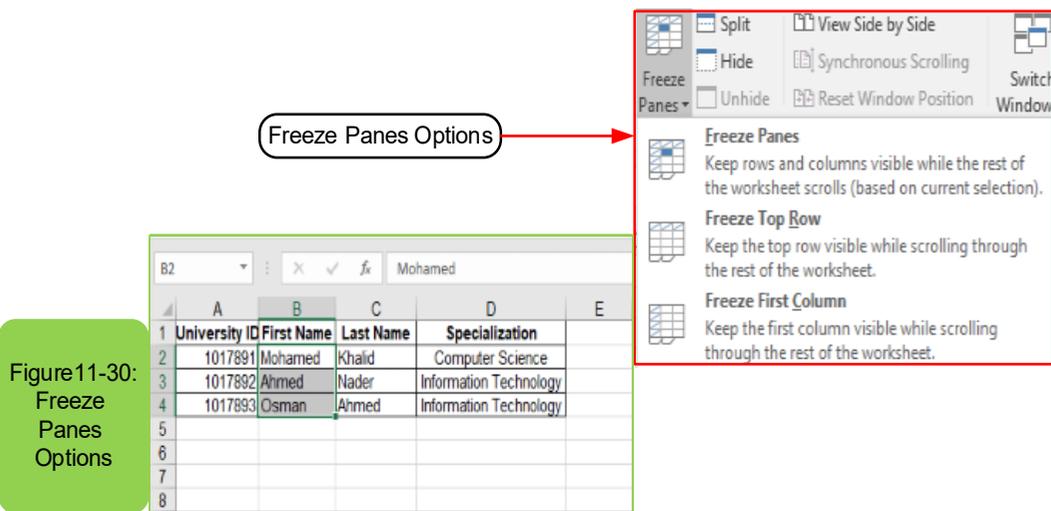


Figure 11-30:  
Freeze  
Pan  
Options

- Click the (Freeze Panes) button to divide the worksheet into four sections from the (Freeze) cell and fix the top cells from the left side of the worksheet.
- To apply: Perform the previous steps, then move the worksheet down and right, as the frozen cells will remain present whatever you move.
- To remove the freeze: Repeat the steps (11 -12) with the option of (unfreeze the panes) as shown in Figure 11 -31.

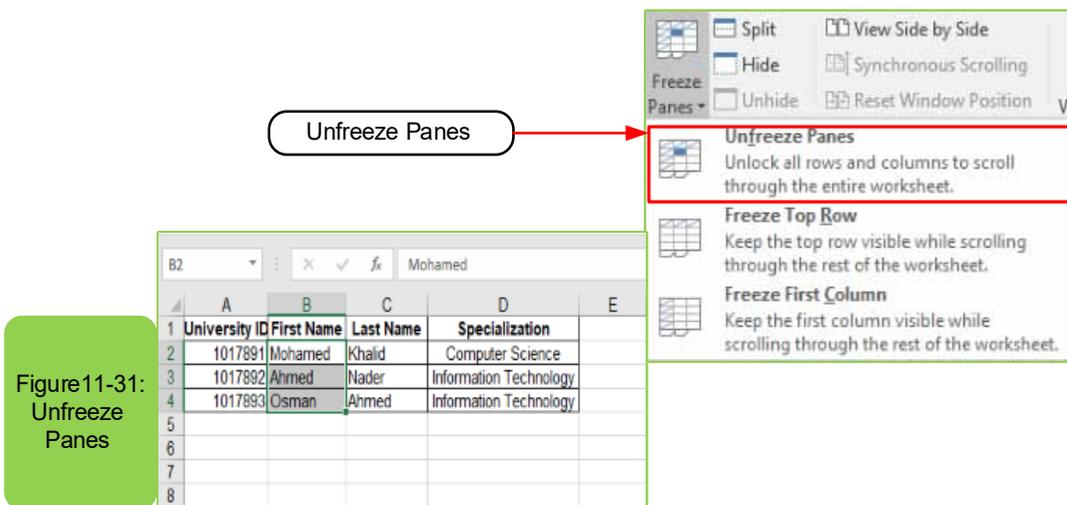


Figure 11-31:  
Unfreeze  
Pan  
es

## Skill 11 - 14

### Recognizing The Matimatical Formulas and Functions



### 11- 13 The Mathimatcal Formulas and Functions

One of the most important features of Excel is the ability to use mathematical formulas, through which different arithmetic operations are performed on the values in worksheet cells. The program also contains large library of different

functions divided into categories, including financial, statistical, engineering, mathematical, trigonometrical, and other functions, to perform various operations on the values in worksheet cells. In this part, you will learn how to use formulas and functions in worksheets.

**Skill 11 - 15**  
**Recognizing The Arithmetic Operations**



**11 -13 -1 The Arithmetic Operations**

The formula is an equation in which arithmetic operations are performed on the values in worksheet cells, such as arithmetic and logical operations, which range from simple arithmetic operations (multiplication, division, addition, subtraction) to more complex operations like (mathematical functions), the following explains how to deal with these operations.

**First: Succession of the Arithmetic Operations**

Excel uses the known succession to perform arithmetic operations, that is:

1. Braces first, from inside to outside.
2. The power.
3. Multiplication and division from left to right.
4. Finally, addition and subtraction from left to right.

**Second: Addition and subtraction of cell contents**

- Click on the cell in which you want the result to appear in it, and then type the sign (=) as in the Figure 11 -32.

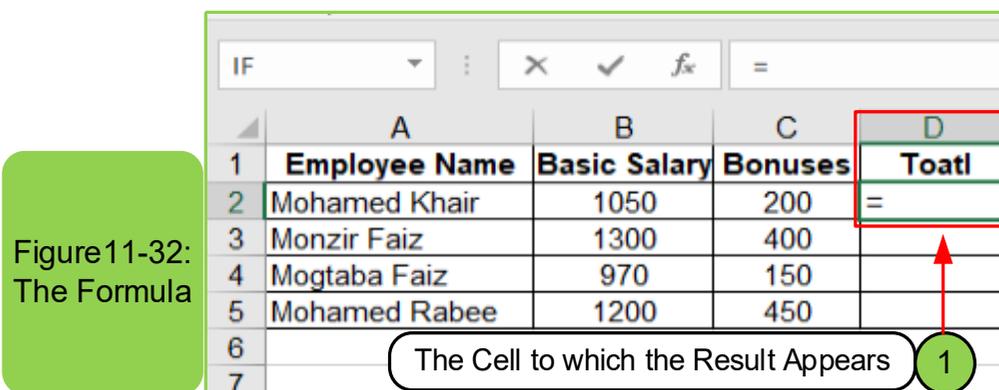


Figure 11-32:  
The Formula

- Click on the first cell of the cells involved in the addition or subtraction process, and note that it will be outlined with dashed line after clicking and the name of the cell will also appear in the resulting cell, as shown in Figure 11 -33.

	A	B	C	D
1	<b>Employee Name</b>	<b>Basic Salary</b>	<b>Bonuses</b>	<b>Toatl</b>
2	Mohamed Khair	1050	200	=C2
3	Monzir Faiz	1300	400	
4	Mogtaba Faiz	970	150	
5	Mohamed Rabee	1200	450	

Cells Involved with Addition and Subtraction Operations 1

Figure 11-33:  
Select a Cell

- Write the sign (+ / -) after the cell name in the resulting cell as shown in the Figure 11-34.

	A	B	C	D
1	<b>Employee Name</b>	<b>Basic Salary</b>	<b>Bonuses</b>	<b>Toatl</b>
2	Mohamed Khair	1050	200	=C2
3	Monzir Faiz	1300	400	
4	Mogtaba Faiz	970	150	
5	Mohamed Rabee	1200	450	
6				
7				

Figure 11-34:  
Writing the  
Formula

- Click on the second cell that involved in the addition or subtraction process and note that it will be outlined with a dashed line after clicking and the name of the cell will also appear in the resulting cell as in Figure 11-35.

	A	B	C	D
1	<b>Employee Name</b>	<b>Basic Salary</b>	<b>Bonuses</b>	<b>Toatl</b>
2	Mohamed Khair	1050	200	=B2:C2
3	Monzir Faiz	1300	400	
4	Mogtaba Faiz	970	150	
5	Mohamed Rabee	1200	450	
6				
7				

Figure 11-35:  
Writing the  
Second Cell

- Press (Enter) to see the result directly on the result cell.
- To insert other cell values, repeat points (2 and 3) depending on the number of cells involved in the process.

Skill 11 - 16

Recognizing How to Fill the Arithmetic Operations



Third: Filling the Arithmetic Operations

The excel worksheet program enables you to get benefit from automatic copying of the arithmetic operations on a specific cell to the adjacent cells by applying the (fill) command used in filling the formats and texts; as in Figures 11-36 and 11 -37, and this is done by following the following steps:

- Click on a cell containing the result of arithmetic or logical operation.
- Set the mouse pointer to the small, dark square on the lower right corner (+) of the cell.

Figures 11-36:  
Filling the  
Arithmetic  
Operations

	A	B	C	D
1	Employee Name	Basic Salary	Bonuses	Toatl
2	Mohamed Khair	1050	200	1250
3	Monzir Faiz	1300	400	
4	Mogtaba Faiz	970	150	
5	Mohamed Rabee	1200	450	
6				
7				

- Then start dragging to the side (columns / rows) that the operation will be performed on and parallel to the work cells in the main arithmetic operation.

Figures11-37:  
Filling the  
Arithmetic  
Operations

	A	B	C	D
1	Employee Name	Basic Salary	Bonuses	Toatl
2	Mohamed Khair	1050	200	1250
3	Monzir Faiz	1300	400	1700
4	Mogtaba Faiz	970	150	1120
5	Mohamed Rabee	1200	450	1650
6				
7				

- The values of the arithmetic operation are immediately filled over all the highlighted areas.

**Skill 11 - 17**  
Recognizing How to Apply the Mathematical Functions



**11 -13 -2 Applying the Mathematical Functions**

The function is a formula that was previously written in the program, and that leads to one of the arithmetic or logical operations. Excel has a large library of different functions, and the following is an explanation of some of the common functions in the program, and the function of each of them.

**Skill 11 - 18**  
Knowing the Calculation of the Average Function



**First: Calculation of the Average Function:**

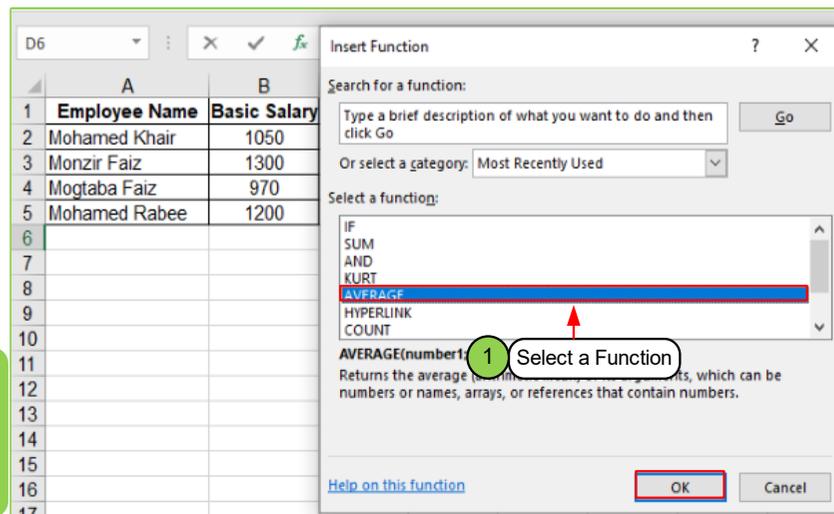
The Average: the sum of the values divided by the number of values. To apply the average function, we follow the following steps:

- Click on the cell in which you want to show its result. as in Figure 11 -38.

Figures11-38:  
The  
Average  
Function

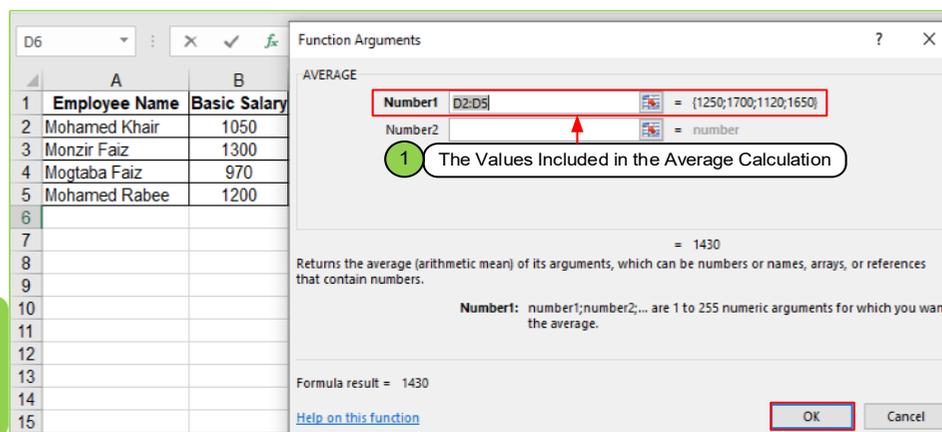
	A	B	C	D
1	<b>Employee Name</b>	<b>Basic Salary</b>	<b>Bonuses</b>	<b>Toatl</b>
2	Mohamed Khair	1050	200	1250
3	Monzir Faiz	1300	400	
4	Mogtaba Faiz	970	150	
5	Mohamed Rabee	1200	450	
6			Average	
7				

- Click the function button (FX) on the (Formula tab), and the insert function dialog box appears directly.
- Click on (Average) and then click (OK), to immediately show the dialog box for selecting cells whose average value should be calculated as in the Figure 11 -39.



Figures11-39:  
The  
Average  
Function

- Drag directly with the mouse on the values involved in the average calculation and they appear as shown in the values box (D2: D5)
- Click (OK), to display the value on the location chosen in Step (1).



Figures11-40:  
The  
Average  
Function

- You can use (fill) in the rest of the cells using the previously explained filling method.

	A	B	C	D
1	<b>Employee Name</b>	<b>Basic Salary</b>	<b>Bonuses</b>	<b>Toatl</b>
2	Mohamed Khair	1050	200	1250
3	Monzir Faiz	1300	400	1700
4	Mogtaba Faiz	970	150	1120
5	Mohamed Rabee	1200	450	1650
6			Average	1430
7				

Figures11-41:  
The  
Average  
Function

### Skill 11 - 19

#### Knowing the Calculation of the Min and Max Functions



#### *Second: Calculation of the Min and Max Functions*

**Max:** A function used to determine the highest value among a group of cells selected from a worksheet.

**Min:** A function used to determine the lowest value among a group of cells selected from a worksheet.

#### *It is calculated by the following steps:*

- Click on the cell in which you want to show its result.

Figuer11-42:  
Max Value  
Calculations

	A	B	C	D
1	<b>Employee Name</b>	<b>Basic Salary</b>	<b>Bonuses</b>	<b>Toatl</b>
2	Mohamed Khair	1050	200	1250
3	Monzir Faiz	1300	400	1700
4	Mogtaba Faiz	970	150	1120
5	Mohamed Rabee	1200	450	1650
6			Average	1430
7			Max Value	

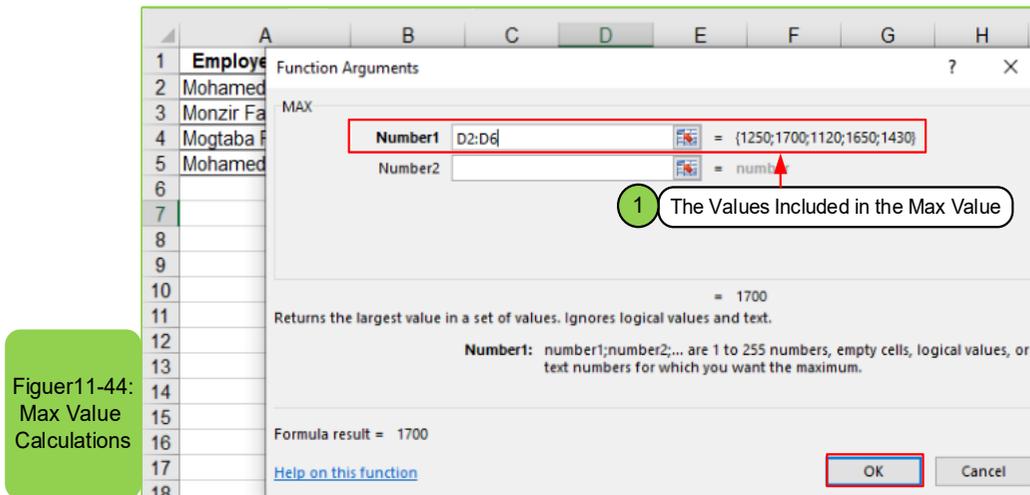
- Click on the function button (FX) on the (formula) tab, and the insert function dialog box appears directly.
- Click on the (Max) or (Min) option, then click (OK), to immediately show the dialog box for selecting cells to determine its lowest or highest value.

Figuer11-43:  
Max Value  
Calculations

The screenshot shows the 'Insert Function' dialog box with the following details:

- Search for a function:** Type a brief description of what you want to do and then click Go. Or select a category: Most Recently Used.
- Select a function:** A list of functions including AND, KURT, HYPERLINK, COUNT, **MAX** (highlighted with a red arrow and a circled '1'), SIN, and SUMIF.
- MAX(number1;number2;...)** Returns the largest value in a set of values. Ignores logical values and text.
- Buttons:** Help on this function, OK (highlighted with a red box), and Cancel.

- Drag directly with the mouse on the values involved in the Min or Max calculations and they appear as follows on the values box (D2: D6).



Figuer11-44:  
Max Value  
Calculations

- Click (OK), so that the value appears on the location chosen in Step (1).

	A	B	C	D
1	<b>Employee Name</b>	<b>Basic Salary</b>	<b>Bonuses</b>	<b>Toatl</b>
2	Mohamed Khair	1050	200	1250
3	Monzir Faiz	1300	400	1700
4	Mogtaba Faiz	970	150	1120
5	Mohamed Rabee	1200	450	1650
6			Average	1430
7			Max Value	1700
8				

Figuer11-45:  
Max Value  
Calculations

### Skill 11 - 20

Kowing the Calculation of the Sum Function



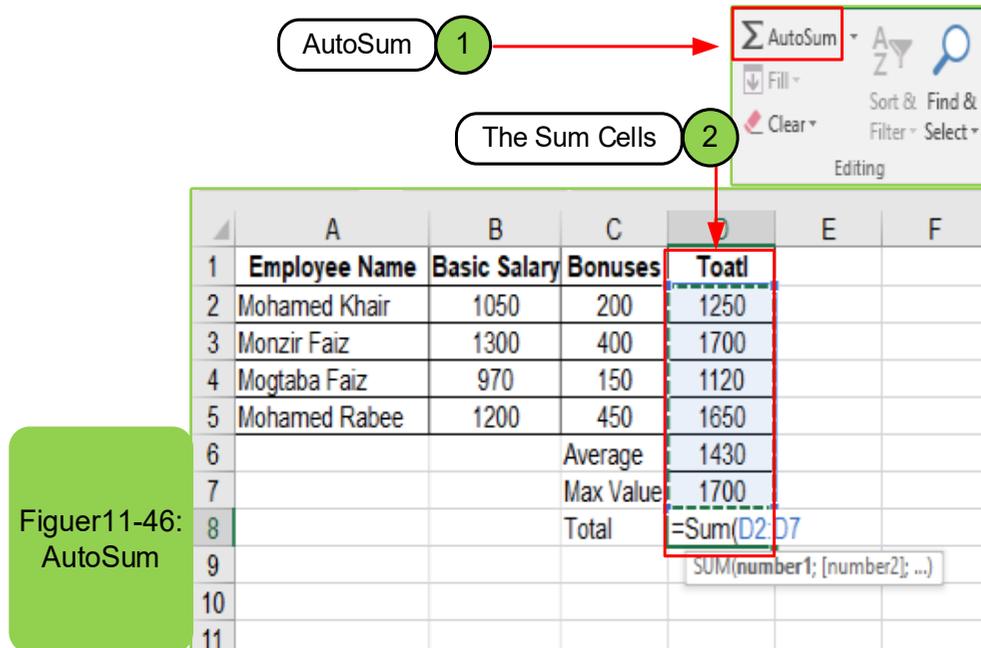
#### **Third: Calculation of the Sum Function:**

Sum function is used for the automatic addition operations.

The AutoSum button performs the addition function, and can be handled by following these steps:

- Click on the cell in which you want to show its result.
- Click the (AutoSum) button on the (Home) tab within the (Editing) group to automatically select the column or row.

- Drag directly with the mouse on the values involved in the addition process, and it appears as follows on the values box (D2: D7).
- Press the (Enter) key to display the value on the location chosen in step (1).



I am going to obtain the sum of the numbers in column B, select cell B8, go to the (Home) tab, then click on the (AutoSum) button. Or select the cell and press (ALT+ =).

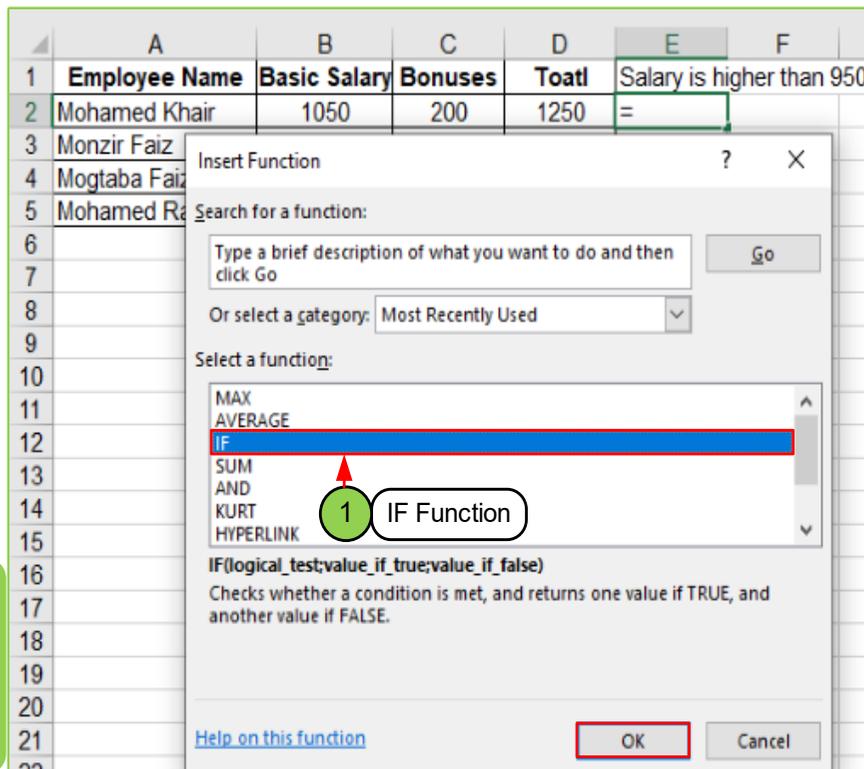
**Skill 11 - 21**  
Kowing the Calculation of Condition Function (IF)



***Forth: Calculation of the Condition Function (IF)***

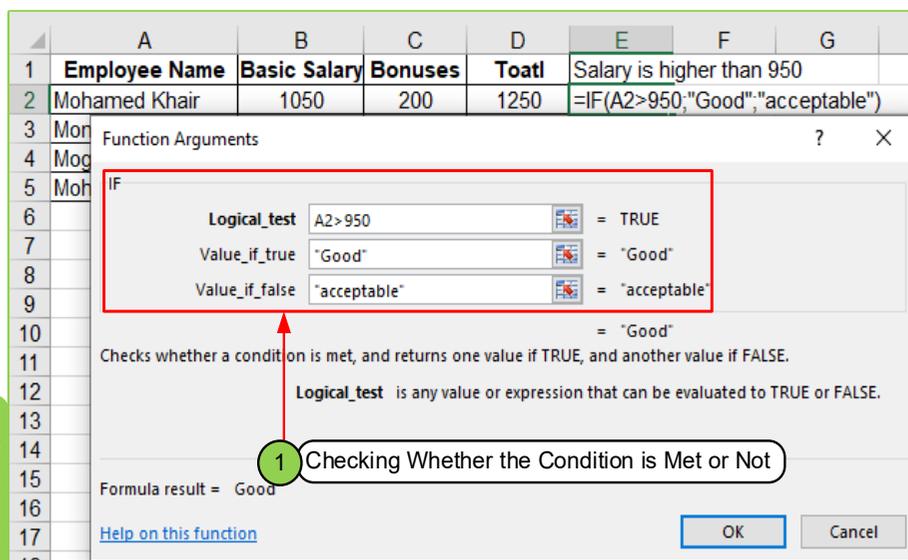
Condition Function (IF) is used to test the cells values so that it gives a certain value that confirms the condition, and it uses the comparison conditions (=, <, >, <>, ...). To deal with this function, follow these steps:

- Click on the cell in which you want to show its results.
- Click on the function button (FX) on the (formula)tab, and then the insert function dialog box appears directly.



Figuer11-47:  
The IF  
Function  
Calculation

- Click on “IF” then click “OK”, then a dialog box will appear to define the condition (logical test)
- Write the values resulting from the verification of the condition or not in the fields (Values if True), (Value if False), respectively. For example, if the salary is greater than 950, type “good” and if less than write “acceptable” as shown in the Figure11- 48.



Figuer11-48:  
The IF  
Function  
Calculation

- Click (OK) to see the results directly on the result cell.
- Perform the filling process as shown in Figure 11- 49.

Figuer11-49:  
The IF  
Function  
Calculation

	A	B	C	D	E	F
1	<b>Employee Name</b>	<b>Basic Salary</b>	<b>Bonuses</b>	<b>Toatl</b>	Salary is higher than 950	
2	Mohamed Khair	1050	200	1250	Good	
3	Monzir Faiz	1300	400	1700	Good	
4	Mogtaba Faiz	970	150	1120	Good	
5	Mohamed Rabee	1200	450	1650	Good	
6			Average	1430		
7			Max Value	1700		
8			Total			
9						

1 The Results

A Table shows the descriptions of functions according to their importance and the most used: whether:

Function	Description
SUM	This function adds all the numbers in a range of cells
IF	This function checks whether a condition is met, and returns one value if TRUE, and another if FALSE.
COUNTIF	This function is used to count the number of cells that confirm specific condition
ABS	This function is used to obtain the absolute value of the number
ACOS	This function returns the arccosine of a number
DGET	This function extracts from a database a single record that matches the conditions you specify
GETPIVOTDATA	This function extracts data stored in a PivotTable
CHAR	This function returns the character specified by the code number
ENCODEURL	This function returns a URL-encoded string
FILTERXML	This function returns specific data from XML content by using the specified XPath
DOLLAR	This function converts a number to text, using currency format \$ (Dollar)
BETADIST	This function returns the cumulative beta probability density function
ADDRESS	This function creates a cell reference as text in a single cell in the worksheet
AND	This function returns TRUE if all arguments are TRUE
CELL	This function returns information about the formatting, location, or contents of the first cell

Function	Description
BIN2DEC	This function converts a binary number to decimal
DATE	This function returns the number to specific date
MODE	This function returns the most frequently occurring or repetitive value in an array of data
RANK	This function returns the rank of a number in a list of numbers

**Common errors when using functions:**

Error	Error Description
#####	The inserted values in the cell are too long and can not be shown
!VALUE#	The typed formula contains error
!DIV/0#	Division by zero
?NAME#	Misspelling in the function or formula name
!REF#	Cell reference is incorrect

**Skill 11 - 22**  
Knowing How to Format Cells

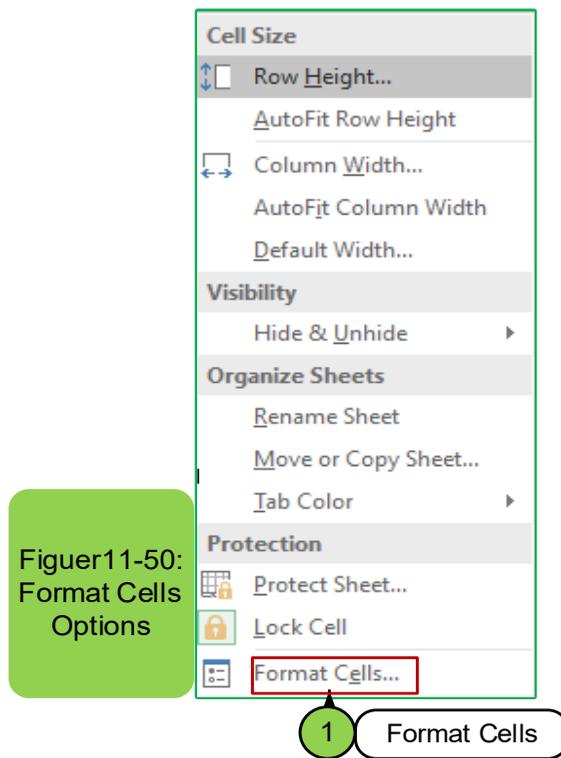


**11 -14 Format Cells:**

**11 -14 -1 Changing the Format (Features) of Specific Cell:**

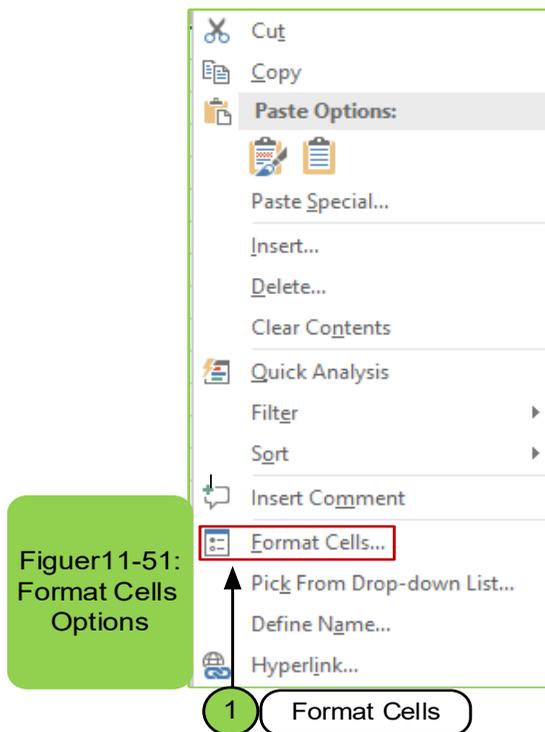
Sometimes the user of the Excel worksheet program needs to change the format (features) of a specific cell by the following:

- We click on the cell whose format we want to change.
- From the "Home" tab, we click on the "Format" option and then a menu appears to us, so we choose "Format Cells" as in Figure 11-150.

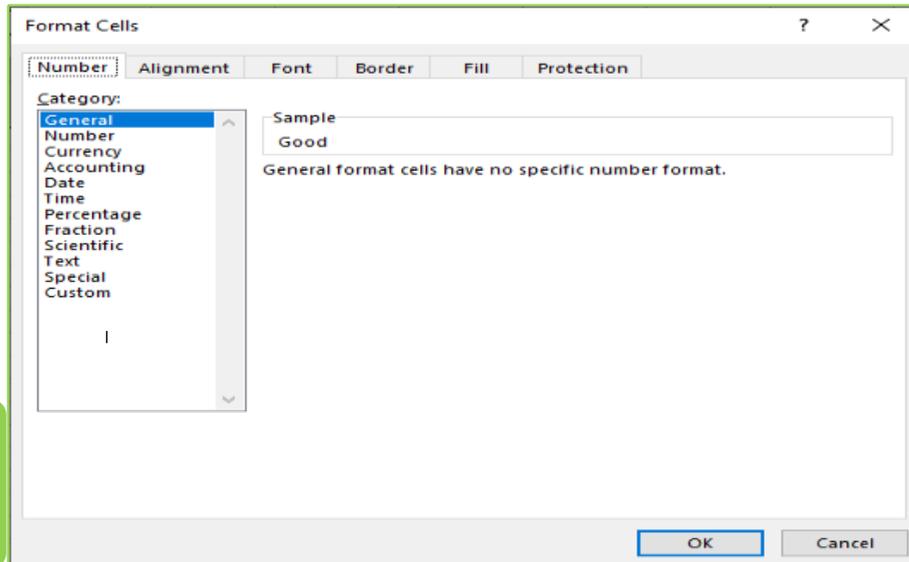


**Note:** There is another way to access the Format Cells option:

- We click the mouse button on the cell we want to change its format to select.
- Click on the right mouse button and then a menu appears and from which we choose the option “Format Cells” as in Figure11 -51.



- When you click on the "Format Cells" option as in the previous menu, a dialog box will appear with a number of options that can be applied to the cell as in Figure11 -52.



Figuer11-52:  
The Options  
within Format  
Cells

- We choose the feature we want to apply to the cell and then we press OK.

**Skill 11 - 23**  
Knowing How to Work with the Format Cells Options

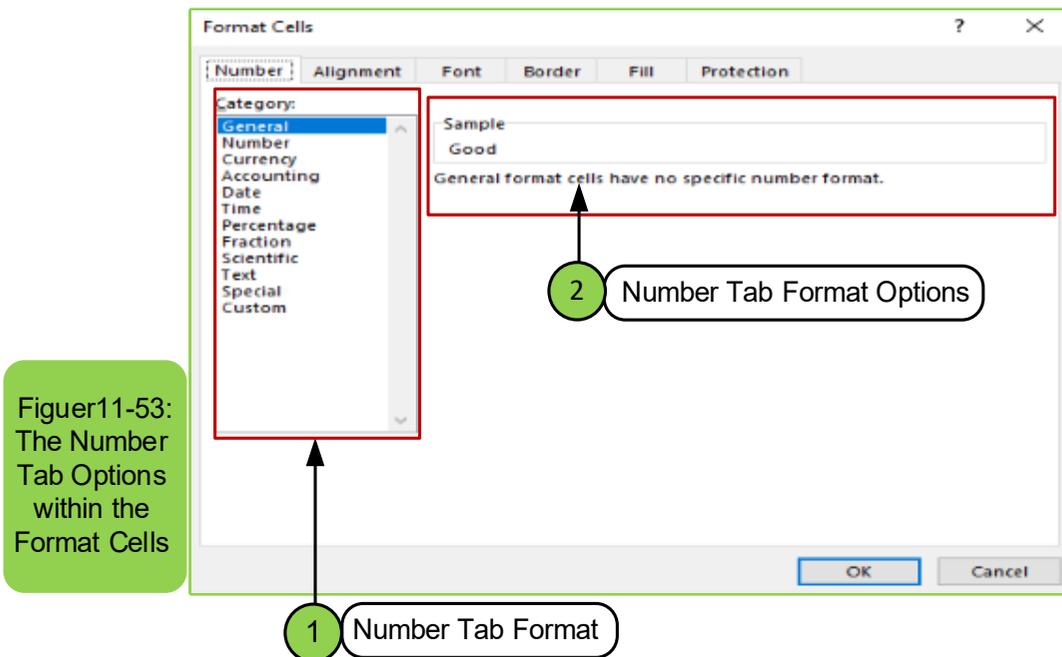


**11 -14- 2 Format Cells Options:**

We find in the (format cells) option, as in Figure (8- 21), six tabs namely, number - alignment - font - border - fill - protection and we will review a part of them:

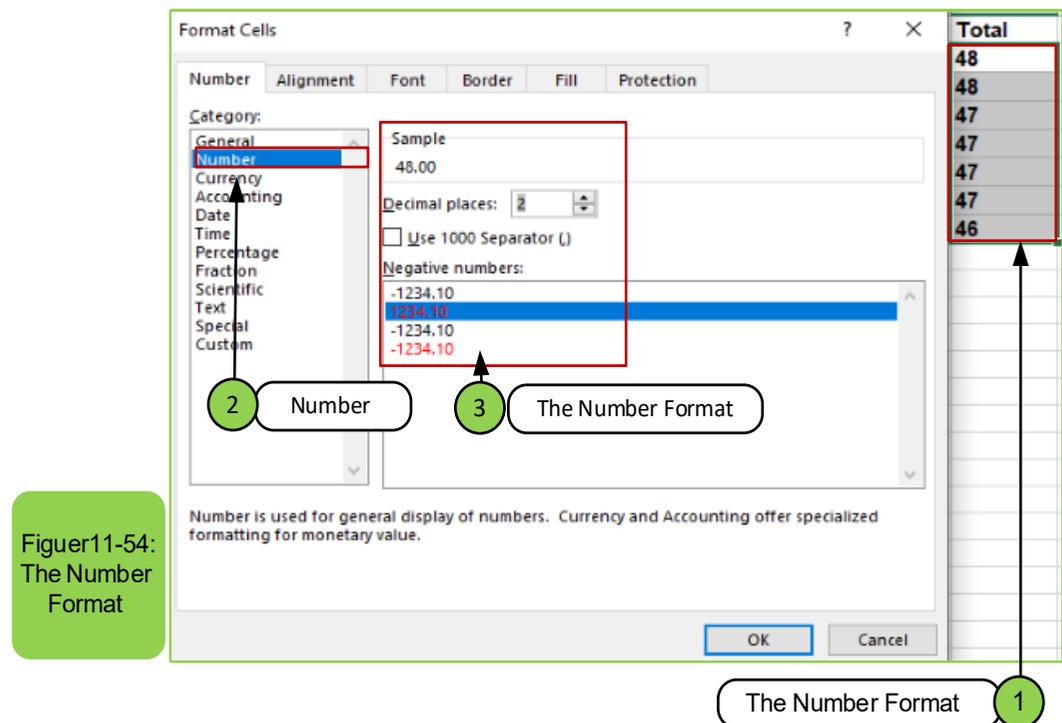
**First: Number Tab:**

This tab is used in the case of cells containing numbers and you want to change the way they are displayed and contains several options as in Figure 11- 53.



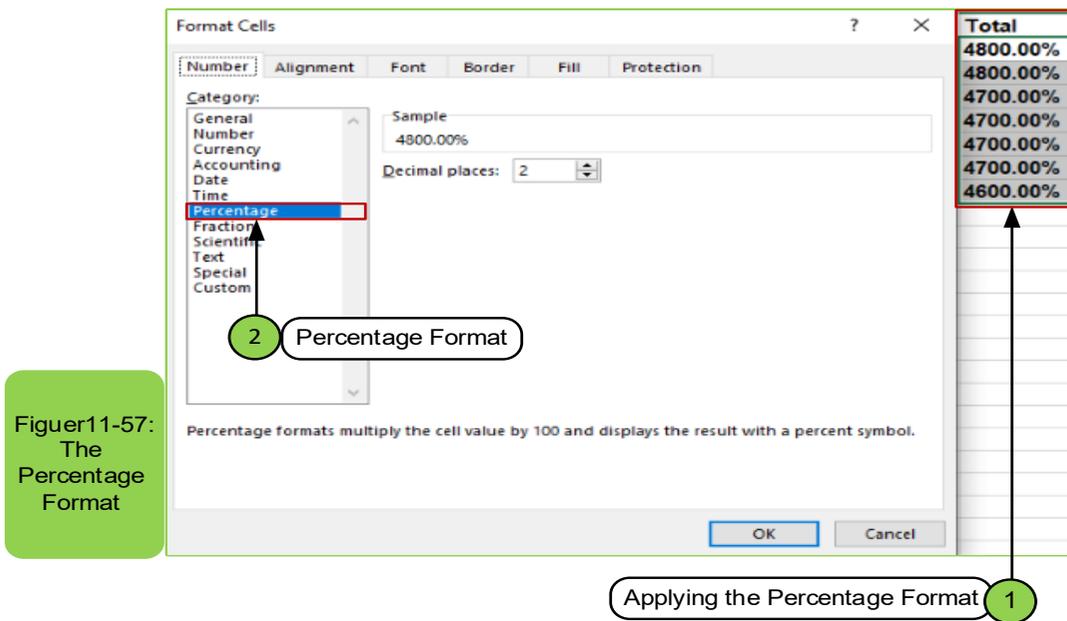
Figuer11-53:  
The Number  
Tab Options  
within the  
Format Cells

- **The Option “Number”:** This option is used in the case of the decimal point and determining the number of decimal places you want. For example, if you choose the (number) option and you selected the value 0 in the decimal, places. Then, this means choosing the correct number without a decimal point and in the case of choosing the value 1 this means the choice of one number after the decimal point and so on, and also through which you can select the form of a decimal point.



Figuer11-54:  
The Number  
Format



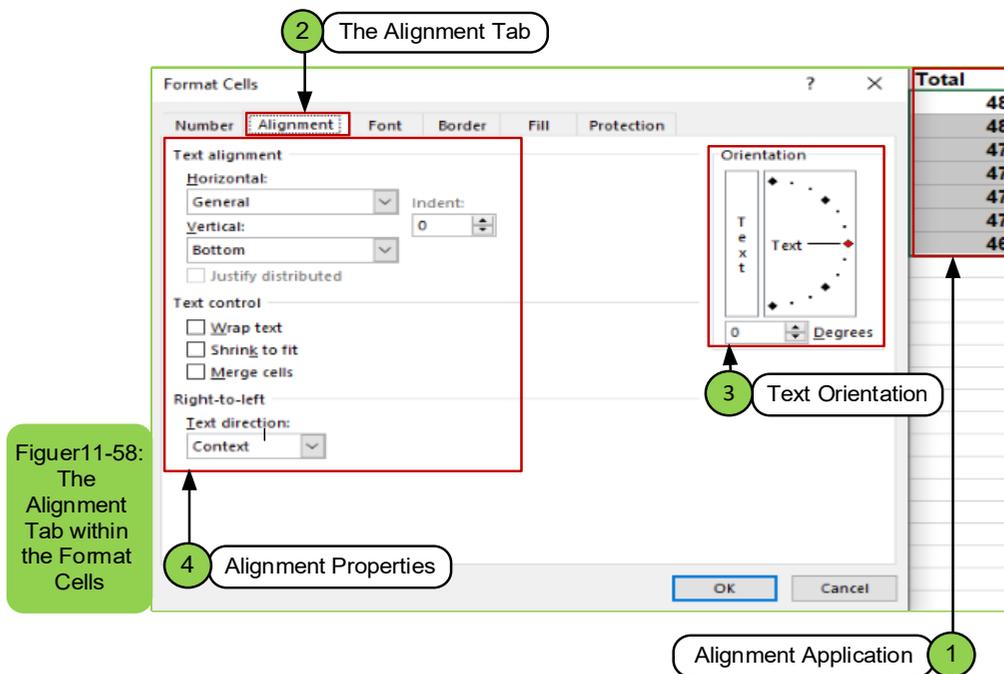


Figuer11-57:  
The  
Percentage  
Format

**Second: The Alignment tab:**

As we mentioned above, there are several tabs within the “Format Cells” option, and we have reviewed the number tab. Continuing, we will explain the alignment tab and its option through which you can change the direction of the text or make an alignment of the text as you like as in Figure1158-. The following steps explain how to apply it:

- Select the cell or cells you want to align.
- From the Format Cells dialog box, click the “Alignment” tab, as in Figure 11- 58, through which the options inside it can be applied.
- We click on the "OK" button to apply the action you took.

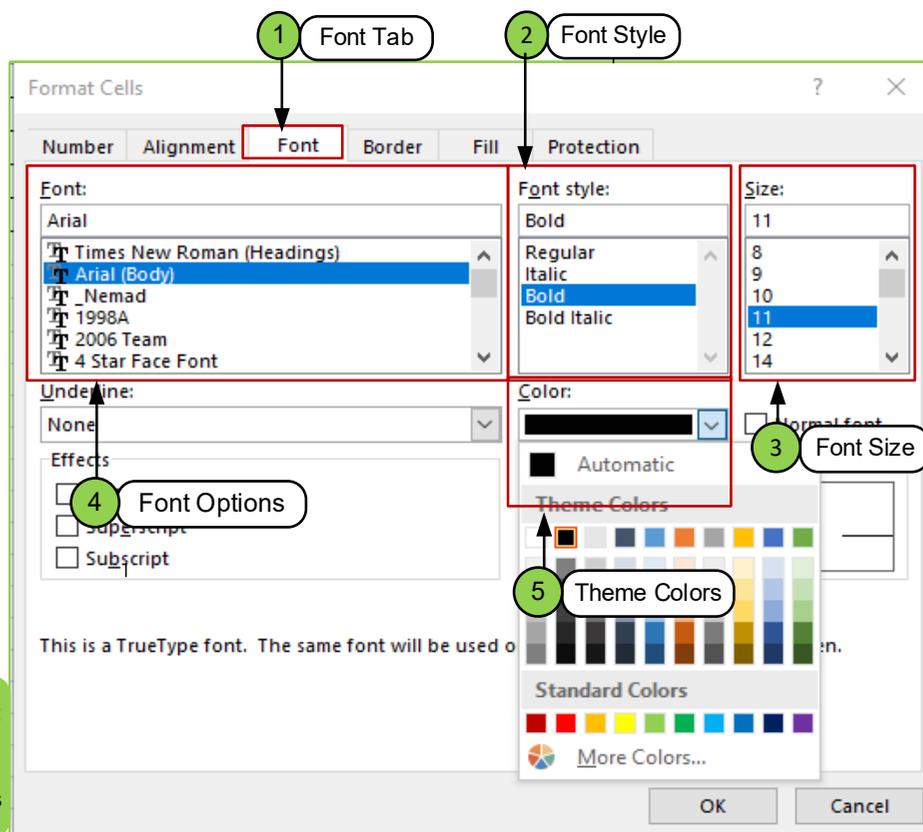


Figuer11-58:  
The  
Alignment  
Tab within  
the Format  
Cells

**Third: Font Tab:**

As we mentioned above, there are several tabs within the “Format Cells” option. We will explain the Font tab and its option, which is used to change the font of the text and the size of the text. We can also change colors and insert effect for them inside the cell or cells as in Figure1159-. To apply them, follow the following steps:

- Select the cell or cells for which you want to change the font style or colors.
- From the Format Cells dialog box, click the "Font" tab, as in Figure (11- 59), through which the font, font style, size and color can be changed and adding some effects to it.
- We click on the "OK" button to apply the action you took.



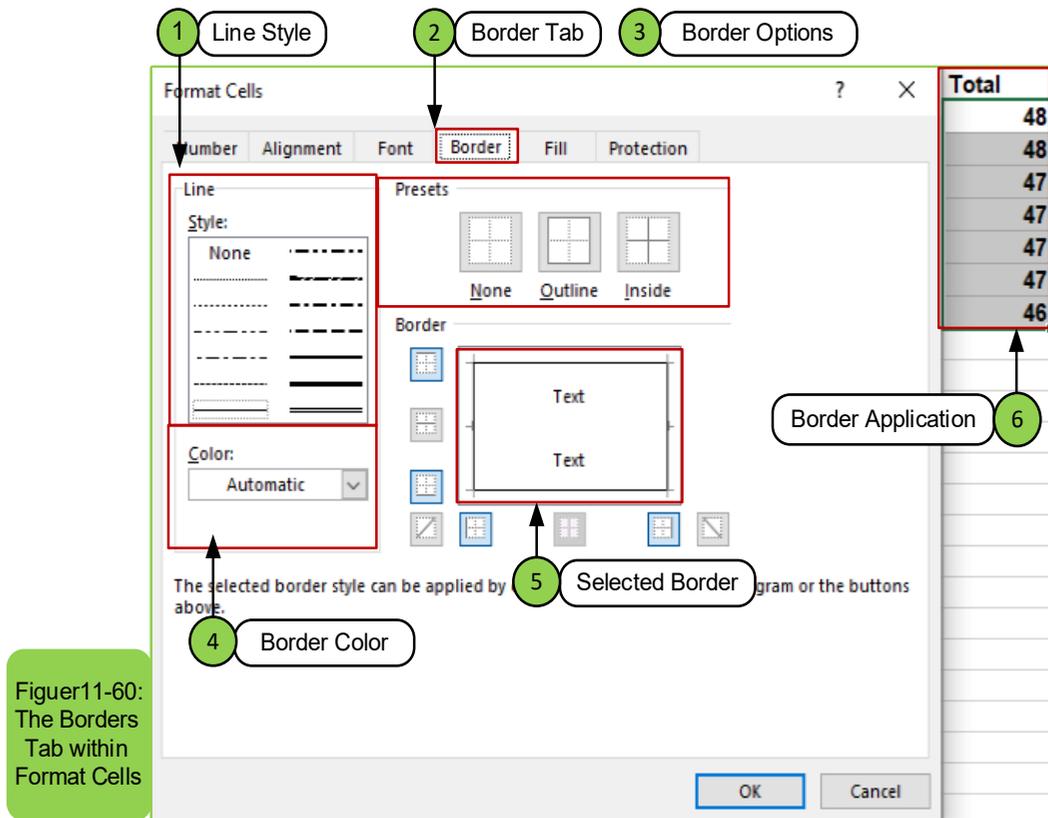
Figuer11-59:  
The Font  
Tab in the  
Format Cells

**Fourth: Border Tab:**

As we mentioned above, there are several tabs within the “Format Cells” option. We will explain the “Border” tab and its option, which is used to change the borders and color of a cell or cells. It can also be canceled and deleted as in Figure (11 -60), and to apply the borders to the cell, we follow the following steps:

- Select the cell or cells you want to add borders to or color.

- From the Format Cells dialog box, go to the "Border" tab as in Figure11 -60 and through it we can determine the border styles and the color of the border, whether they are borders inside or outside the cell.
- Click "OK" to apply the feature.



Figuer11-60:  
The Borders  
Tab within  
Format Cells

**Fifth: Fill Tab:**

As we mentioned above, there are several tabs within the "Format Cells" option. We will explain the "Fill" tab and its option, which is used to change the color of a cell or cells. It can also be canceled and deleted as in Figure (1161-). To apply the fill color to the cell, we follow the following steps:

- Select the cell or cells to be filled with a color.
- From the Format Cells dialog box, go to the "Fill" tab as in Figure1161-, and through it we can select the color that we want to add.
- Click "OK" to apply the feature.

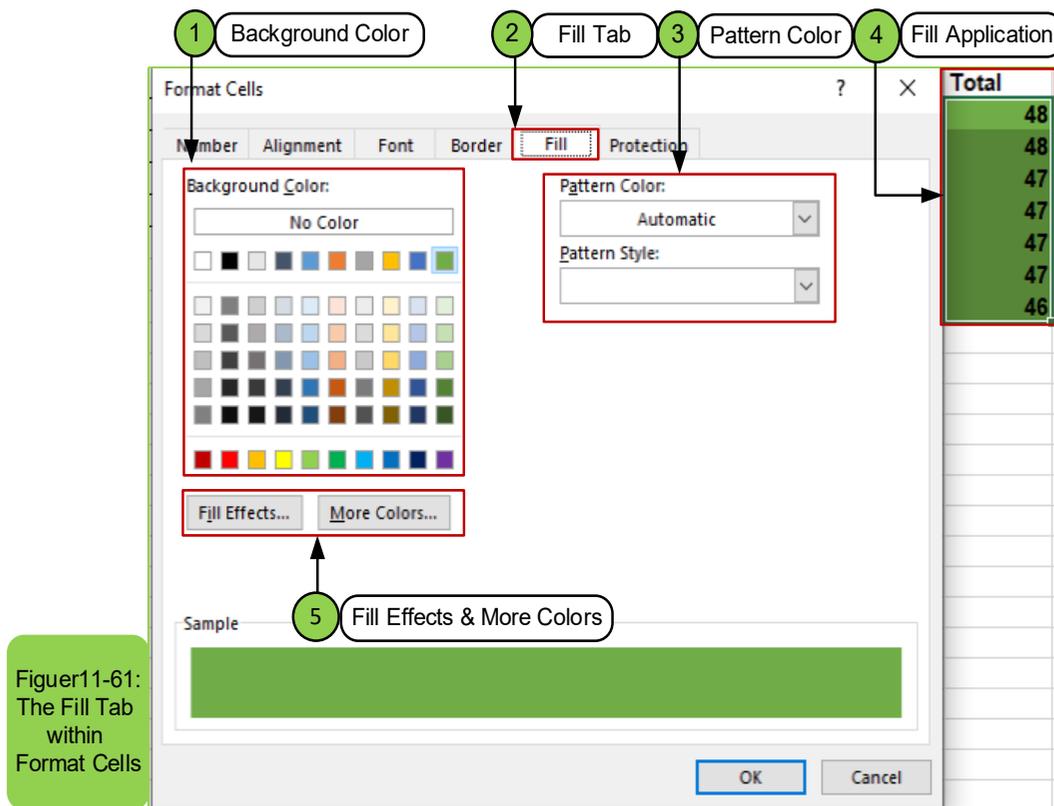


Figure 11-61:  
The Fill Tab  
within  
Format Cells

**Skill 11 - 24**  
Knowing How to Work with the Objects

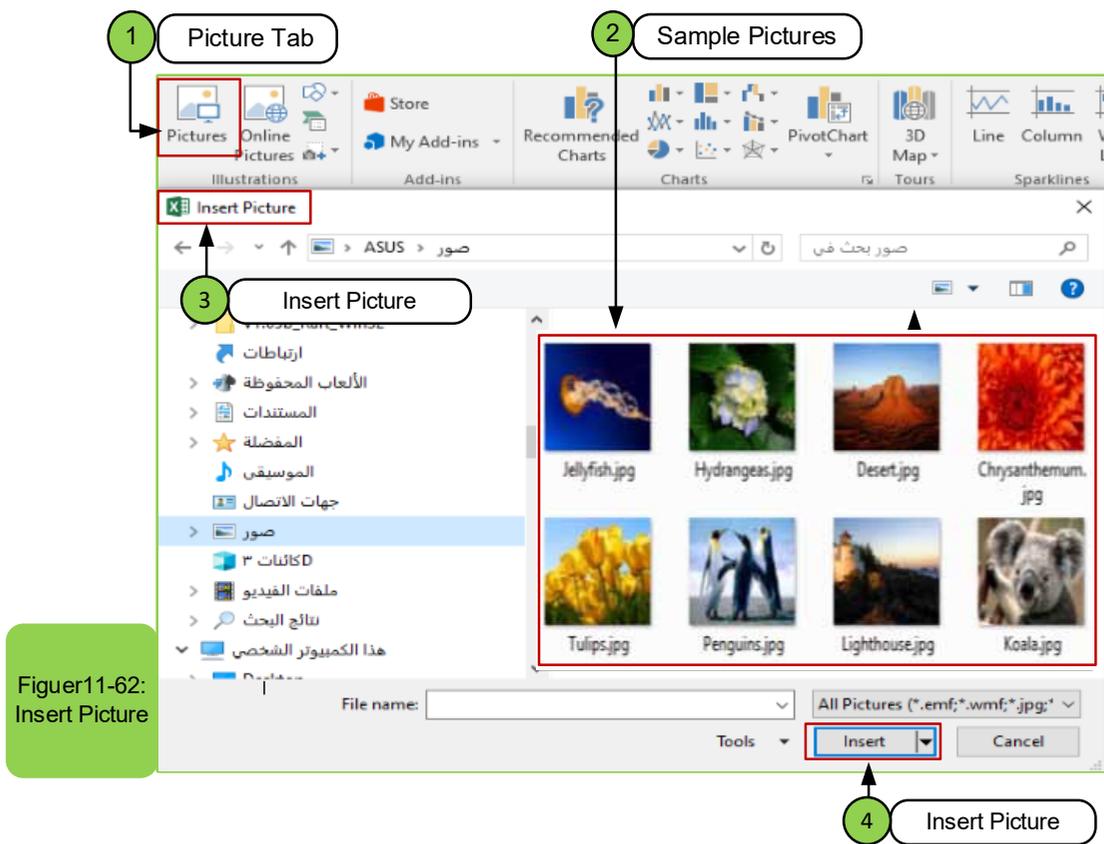
**11 -15 Insert Objects:**

Sometimes the user of excel worksheet program need to insert an object, insert illustrations, or import an object such as a picture, clip art, or AutoShape.

**Skill 11 - 25**  
Insert Pictures

**11- 15 -1 Insert Picture:**

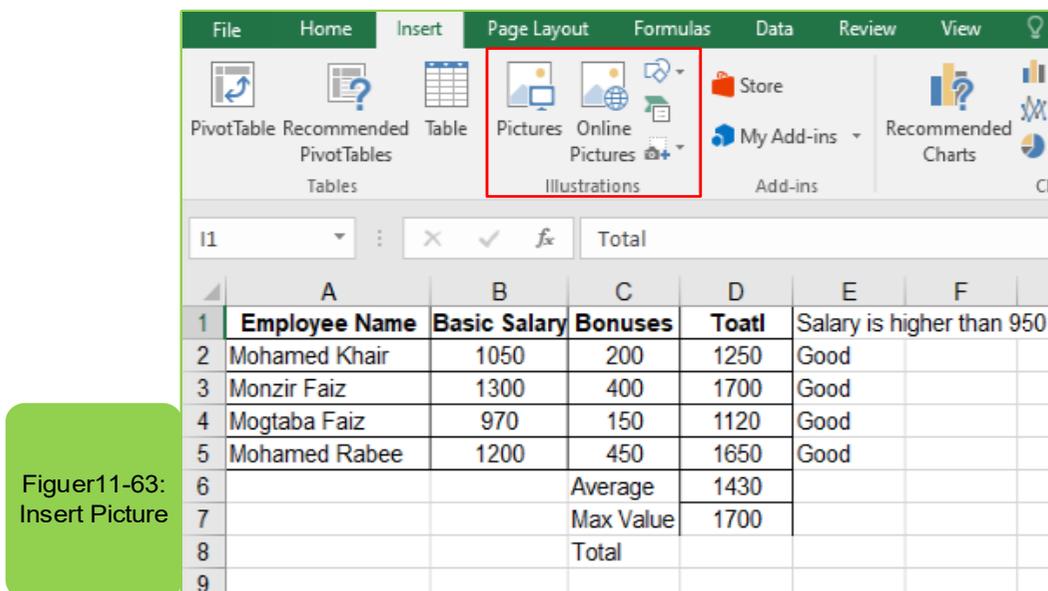
- Select the cell or cells you want to insert the picture near by clicking the left mouse button.
- From the “Insert” tab, we select “Pictures” which is located within the “illustrations” group as in Figure (1162-).
- The Insert Picture window appears for us and we select the picture we want to insert and click on it with the left mouse button, as in Figure 1162-.
- Click on the “Insert” option to apply the action.



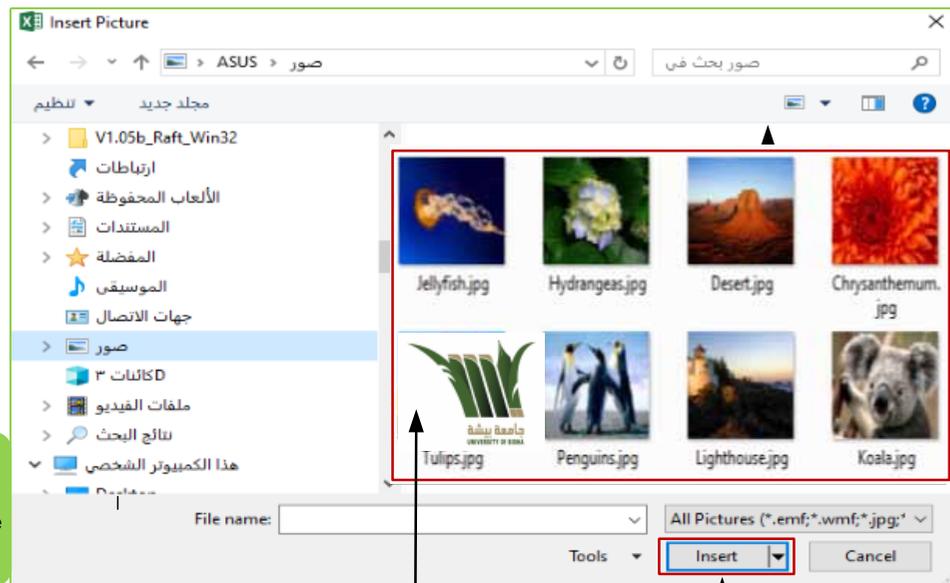
### Another Way to Insert Pictures

To insert a picture, follow these steps:

- From the Insert tab and from illustrations group, click pictures as shown in Figure 11-63.



- The insert picture window will appear as shown in Figure 11-64.
- Select the picture location on the computer



Figuer11-64:  
Insert Picture

- 1 Select Picture
- 2 Insert Picture

- Choose the picture you want to insert by clicking on it with the left mouse button once and then clicking Insert or by pressing the left mouse button twice.
- The picture will be inserted in the document as shown in Figure 1165- Logo picture.

	A	B	C	D	E	F	G	H	I
1	<b>Employee Name</b>	<b>Basic Salary</b>	<b>Bonuses</b>	<b>Toatl</b>	Salary is higher than 950				
2	Mohamed Khair	1050	200	1250	Good				
3	Monzir Faiz	1300	400	1700	Good				
4	Mogtaba Faiz	970	150	1120	Average				
5	Mohamed Rabee	1200	450	1650	Max Value				
6			Average						
7			Max Value						
8			Total						
9									
10									

Figuer11-65:  
Insert Picture

### Resize the Picture:

You can change the size of the pictures till they are compatible with the desired size of the worksheet by selecting the picture by clicking on it with the mouse button till the eight selection circles appear as in the Figure 1166-.

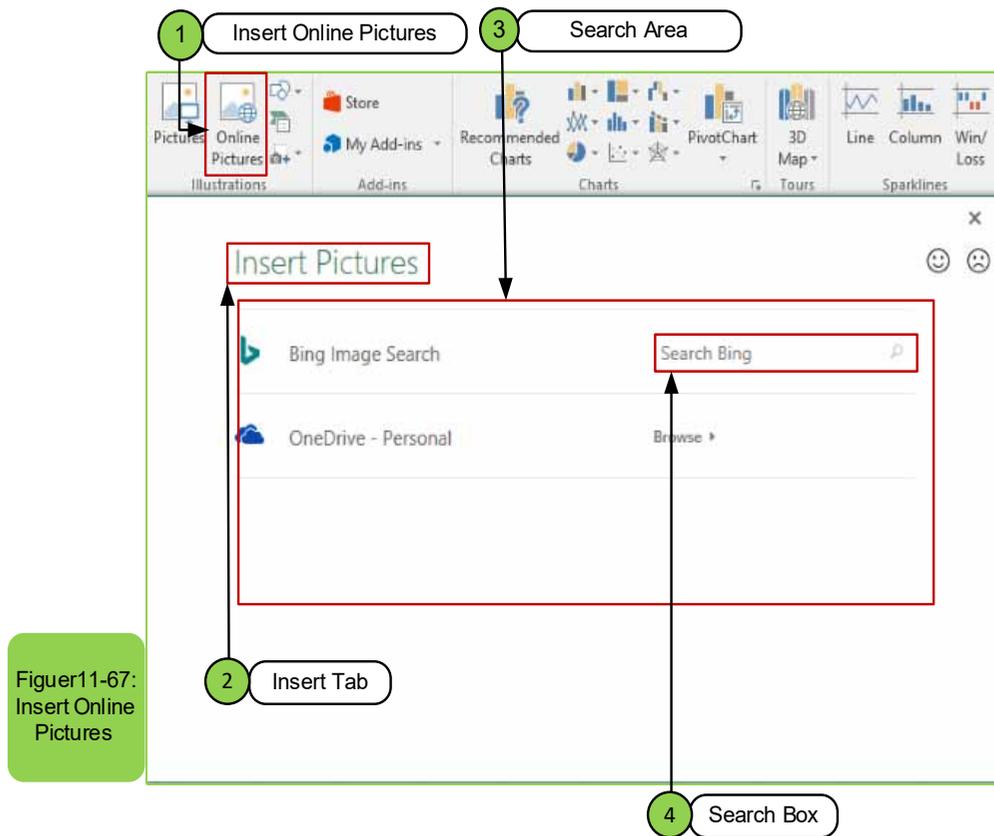


- If the mouse pointer reaches one of the eight circles, its shape will turn into two crossed arrows.
- If you want to enlarge the picture so that you maintain the ratio between height and width, place the mouse pointer at one of the four circles located at the corners, then the pointer will turn into two opposite inclined arrows at an angle of 45 degrees.
- Click the left mouse button and then the pointer becomes crossed arrows and drag.
- Leave the mouse button when you reach the desired size.

### **Insert Pictures via the Internet:**

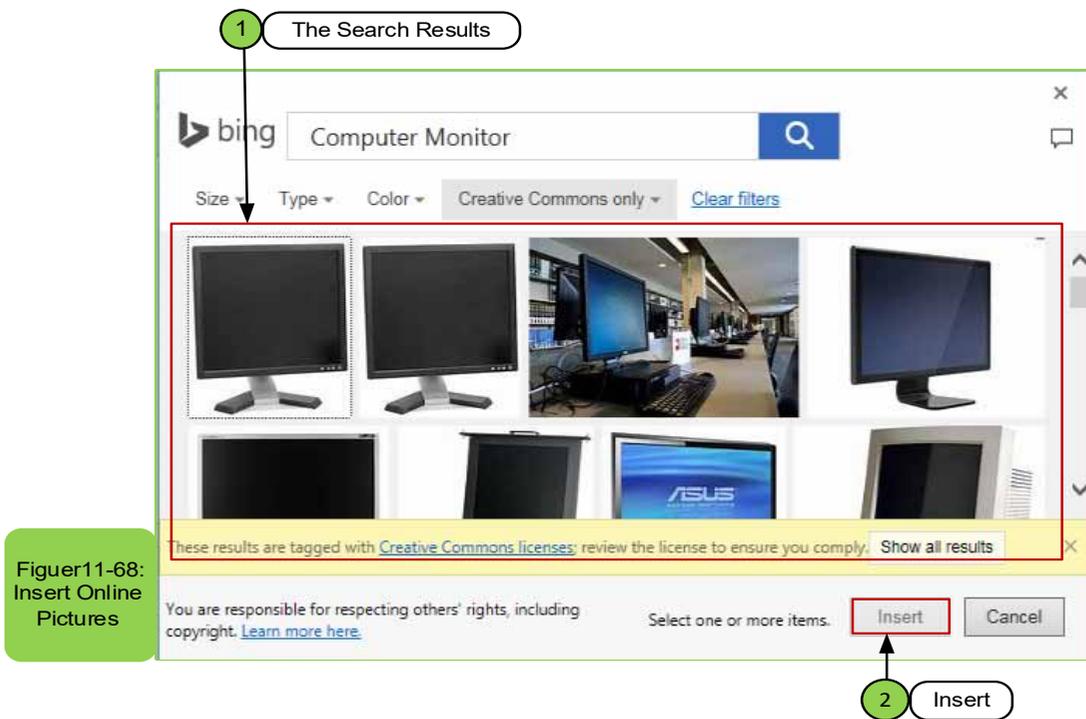
Through the excel worksheet program, we can search for pictures from various sources and insert them via the Internet, through the following steps:

- Select the place or cell you want to insert the picture near.
- From the “Insert” tab we choose “Online Pictures” that falls within the illustrations group as shown in Figure 11 -67.
- The Insert picture window appears for us and we write the type of picture that we want to insert in the search box and then click Enter as in Figure11 -67.



Figuer11-67:  
Insert Online  
Pictures

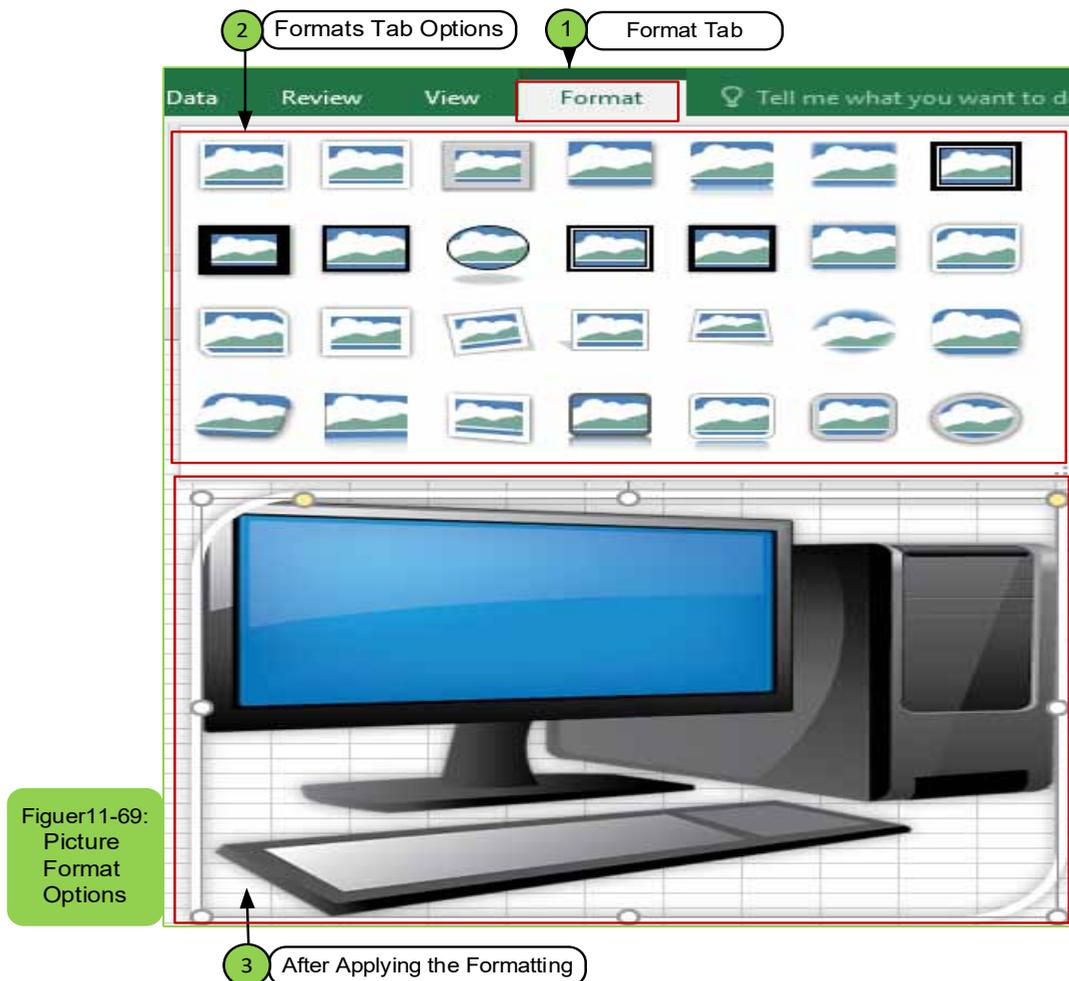
For example, to search for a picture of the computer monitor, we write in the search box as in option (4) the computer monitor and press Enter. Then we wait for the search results to appear and choose the desired picture by clicking on it with the left mouse button and then clicking on the button “insert” as in the figure 11 -68.



Figuer11-68:  
Insert Online  
Pictures

**Note:** We can also change the size of the picture that was inserted into the workbook by:

- Selecting the picture you want to resize by clicking on it with the left mouse button. Small circles will appear on the edges of the picture.
- Placing the pointer on the circle in the direction you want to change the size and then drag till we get the desired size.
- We can also change the format of the picture inserted into the workbook by:
- Selecting the picture, you want to change its format by clicking on it with the left mouse button. The "Picture Format" tab will appear.
- Many formatting options will appear in the "Picture Format" tab. Choose the appropriate format that you want to apply, as shown in Figure 11 -69.



Skill 11 - 26

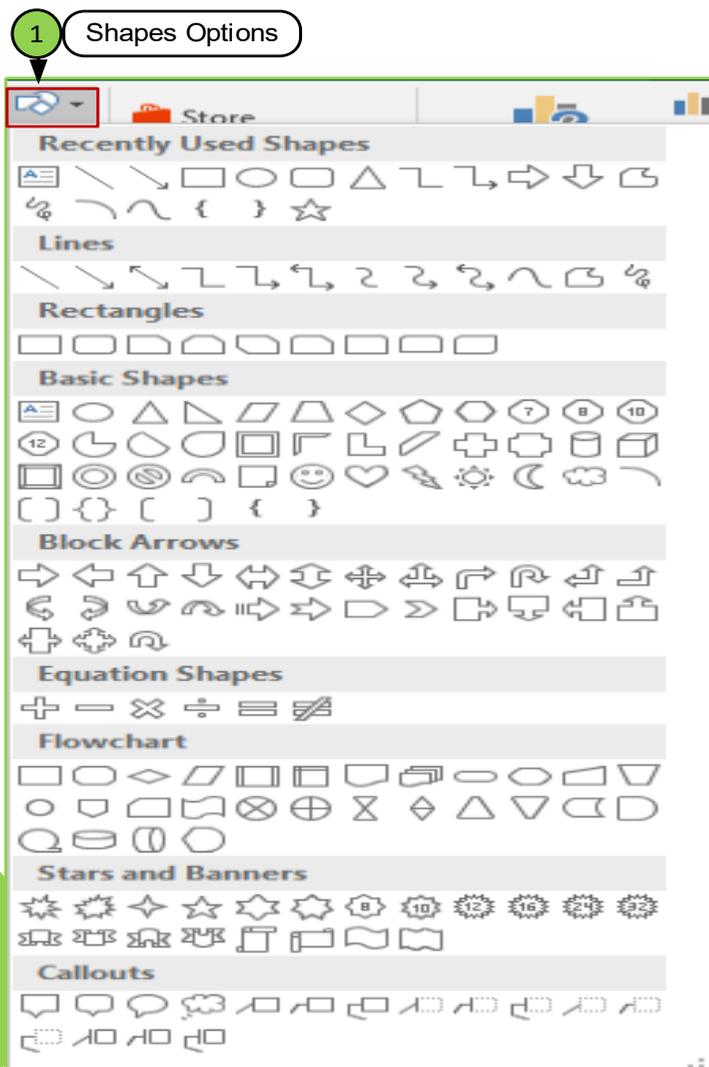
Recognizing/Knowing How to Insert Shaps



**11 -15 -2 Insert Shapes:**

Sometimes the user of excel worksheet program may need to insert shapes such as circles, squares and names, or automatic graphics (SmartArt). To perform one of the two cases, we follow the following steps:

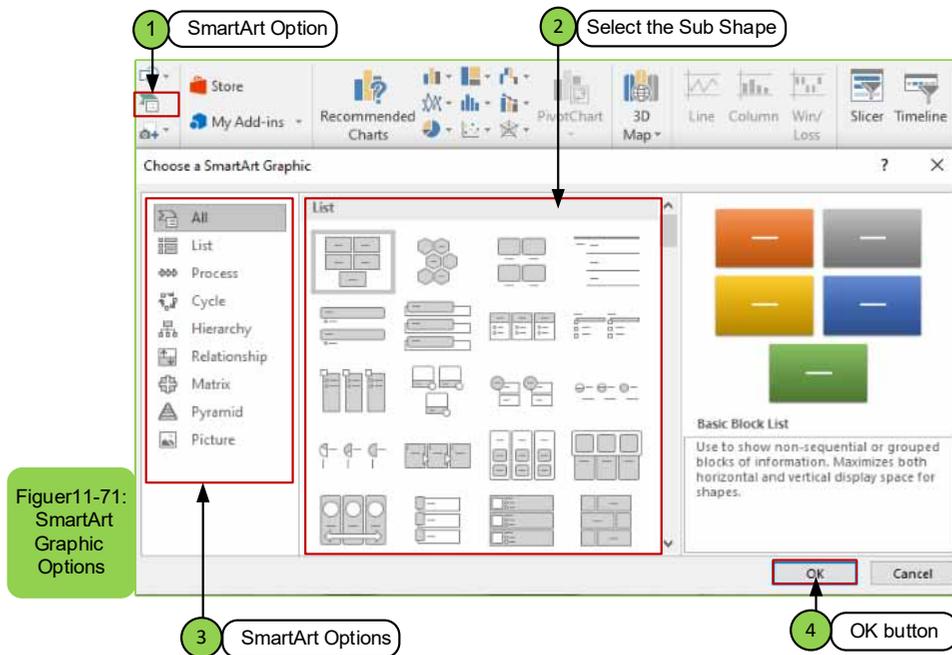
- From the “Insert” tab then “Shapes” that falls within the illustrations group, a list will appear to us as in Figure1170-.
- We choose the shape that we want to insert by clicking on it with the left mouse button.
- We go to the place we want to place the shape and press the left mouse button to apply.



Figuer11-70:  
Adding a  
Shape from  
the Shapes  
Option

**If you need to add (SmartArt), we follow these steps:**

- From the "Insert" tab then "SmartArt" which is located within the illustrations group, we click on it with the left mouse button, and then a menu appears as in Figure1171-
- We go to SmartArt graphic options to choose the desired SmartArt shape
- Then we click on the desired SmartArt with the mouse
- We click on the "OK" button to apply the required SmartArt.



**Skill 11 - 27**  
Knowing How to Work with Charts



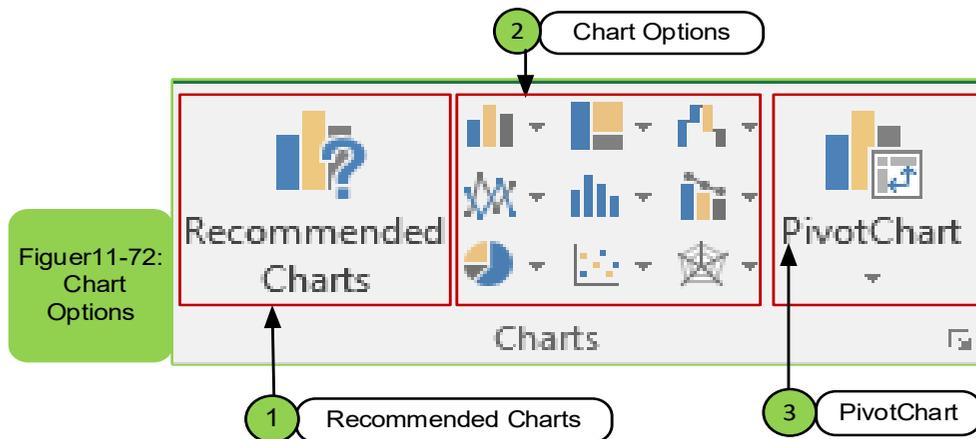
**11 -15- 3 Charts:**

One of the most important features of the excel worksheet program is that we can represent data and display it in the form of charts or graphs, through which it can help in understanding the results more quickly, so we find that there are several types of charts such as:

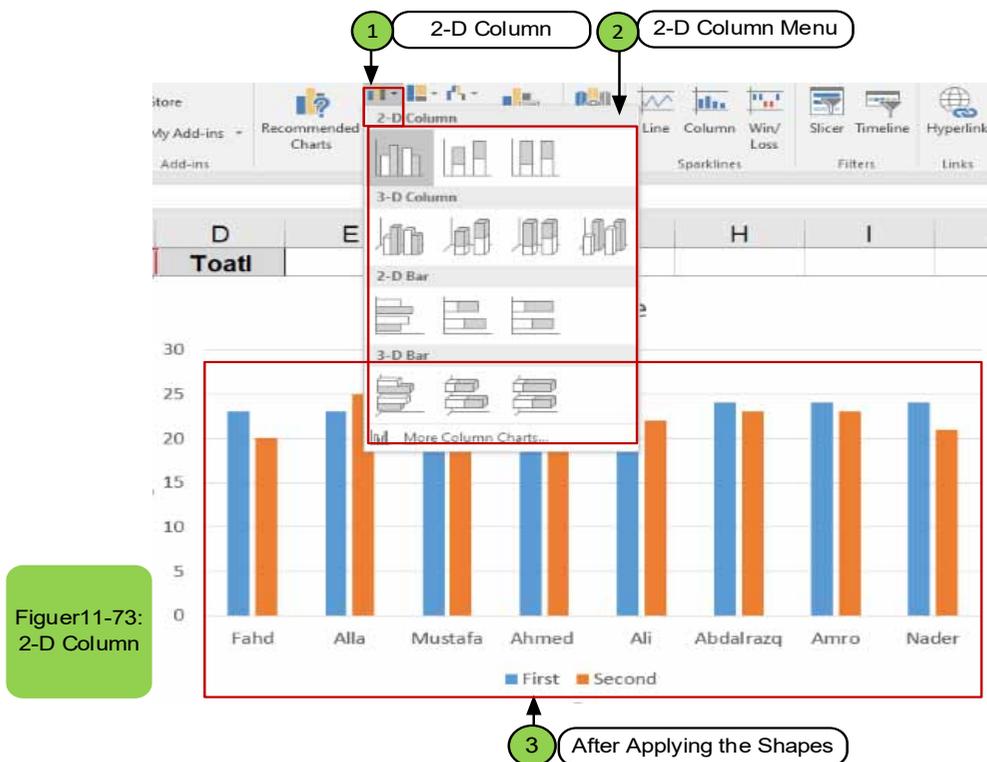
- Pivot Chart
- Column or Bar Chart
- Hierarchy Chart
- Line or Area Chart
- Waterfall, Funnel, Stock, Surface, or Radar Chart
- Scatter or Bubble Chart
- Pie or Doughnut Chart

To apply the chart, the following steps should be followed:

- You must specify the data (by selecting columns) from the open workbook that you want to represent in the form of charts or graphs.
- From the “Insert” tab, we go to the “Charts” group menu, as shown in Figure 11- 72.

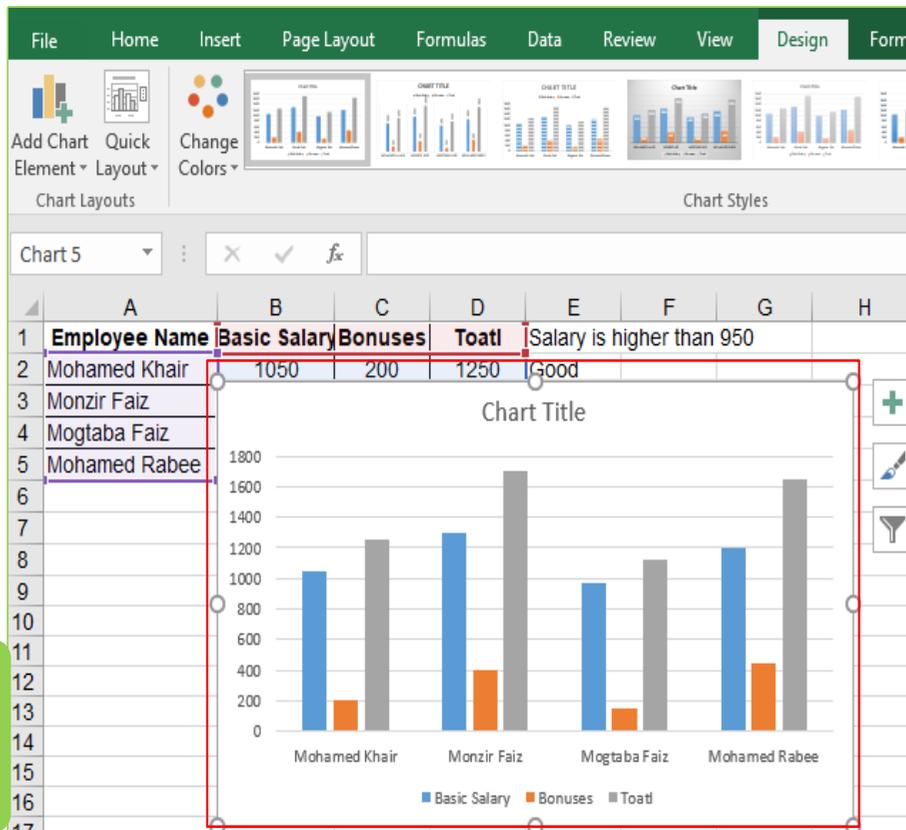


- There are several types of charts with which data can be represented, such as insert column or bar chart or insert hierarchy chart, insert waterfall or stock chart, insert surface chart, insert scatter chart, or insert pie chart.
- In case of the chosen the bar chart as in Figure11 -73, then we click on the chosen chart with the left mouse button.



**To Edit the Chart:**

- Click on the chart, then click on the (Chart Design) tab to enable you to format the layout of the chart:
- By choosing one of the options in the (chart layouts) group that allow adding axis title, chart title, showing chart data (by clicking on the axis label), you will be able to edit by clicking directly on the chart title or the axis title and edit directly as in Figure 11- 74.



Figuer11-74:  
Insert Chart

**Skill 11 - 28**  
Knowing How to Change the Type and Size of Chart



**To control the size of the chart:**

- Click on the chart, so that the movement points appear on the four corners of the chart and in the middle of each line of the chart area as shown in the figure 11 -75.
- Click and hold on any of the movement points and drag in the desired direction, so that the size of the chart directly increased or reduced.

Figure 11-75:  
Controlling a  
Chart





# Chapter 12

## Internet Network







## Internet Network

### Objectives

#### ➔ Main objectives:

1. Use the internet efficiently.
2. Use search engines, scientific researcher.
3. Learn about wikipedia.
4. Search the digital library

#### ➔ Secondary objectives

After studying this chapter, the student is expected to master the following knowledge and skills:

1. Understanding how the Internet works.
2. Use the web browser.
3. Browse the internet and understand the web addresses.
4. Dealing with online search engines.
5. Advanced search in Google search engine.
6. Search using Google Scholar.
7. Browse and search wikipedia.
8. Learn about the digital library and its importance.
9. How to access the digital library at Bisha University.
10. Search and get full text in the digital library.



## 12- 1 Understand how the Internet work

The Internet is a network that connects different and dispersed networks to be one extended network that uses unified communication protocols. The Internet is based on a portion of the resources of public communications networks around the world, such as STC. Technically, the Internet needs a set of key components to operate efficiently, such as servers, data transfer media, various connectivity devices, network software and protocols, and computer.

The World Wide Web (WWW) is a huge repository of information distributed on millions of pages and websites, stored on thousands of servers connected together by the Internet. This information can be accessed by using a web browser. The browser is the first thing a user can see to access internet services, browse the web, and search for information. In the following parts we will explain how to browse the web and search through one of the most popular browsers at this time.

### Skill 12 - 1

Learn about the most popular Web Browsers.



#### 12 -1 -1 Web Browsing

As mentioned before, information on the Internet is contained on websites and on their pages. In order to connect to the Internet, you need to have a connected computer, internet service provided through a service provider or internet service provider, and a web browser. You can get internet access through many companies and internet service providers such as: your mobile phone company, home phone, or even some local stores that can offer you internet connection. There are many ways to connect to the Internet, and each method is different in terms of connection speed, signal strength, user data size, etc.

The web browser lets you search for the information you need, and enables you to retrieve, view, print, or even send it online. This includes software that allows you to:

- Send and receive emails around the world almost immediately.
- Read messages from newsgroups (or forums) about thousands of topics where users share information and opinions.
- Browse and search the World Wide Web, where you can find and search various types of data such as text, graphics, audio clips, animations (video), interactive materials, etc.

Among the most popular browsers are Microsoft Edge, NetscapeNavigator, Google Chrome, Mozilla FireFox and many more. Depending on the browser you're using, the display format for a particular website may vary slightly. We will talk about one of these famous browsers integrated with Windows 10 operating system which is Microsoft Edge.

## Skill 12 - 2

### Learn about Microsoft Edge features



#### 12 -1- 2 Microsoft Edge

Definition: 'Microsoft Edge is the fastest and safest web browser designed for Windows 10' as Microsoft - the producer-decriped it. It is integrated into Windows 10 as the heir to the famous Internet Explorer program that was included in most previous Windows versions. Microsoft Edge came in a new prefusion filled with many features including:

1. **Simplicity and speed:** It's designed to help you focus on what's most important to you.
2. **Integrate annotation:** a feature that allows users to use the pen, and then share notes and annotations. The browser supported drawing and writing directly on web pages with touch-screen using typing pens.
3. **Built-in Cortana Digital Assistant:** Cortana shows different information within the browser's address bar and Cortana also allows control of the browser via voice commands such as "Make this my first page" and "Go to Facebook."
4. **Group tabs in a new way:** This feature allows you to group tabs, which are a group of pages open at the same time in the browser, with each other in a way that reduces the congestion of tabs if you open many of them, for example, the users can separate personal tabs from other tabs
5. **Available for many digital devices:** it is not only PC-based software, but an application compatible with tablets and smartphones.
6. **Reading Style:** This feature deletes all ads and non-important sections of the web pageand therefore allows them to be read like a book page.

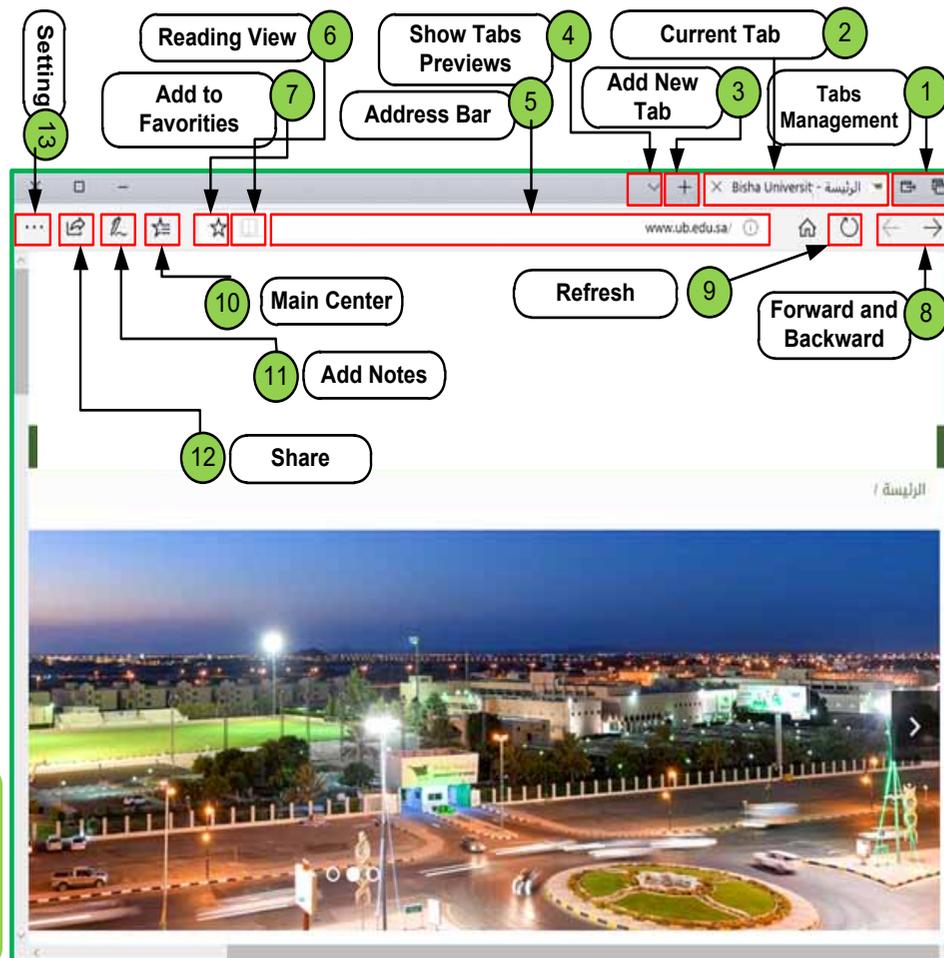


Figure 12-1  
Microsoft  
Edge  
Browser  
Layout

### Skill 12 - 3

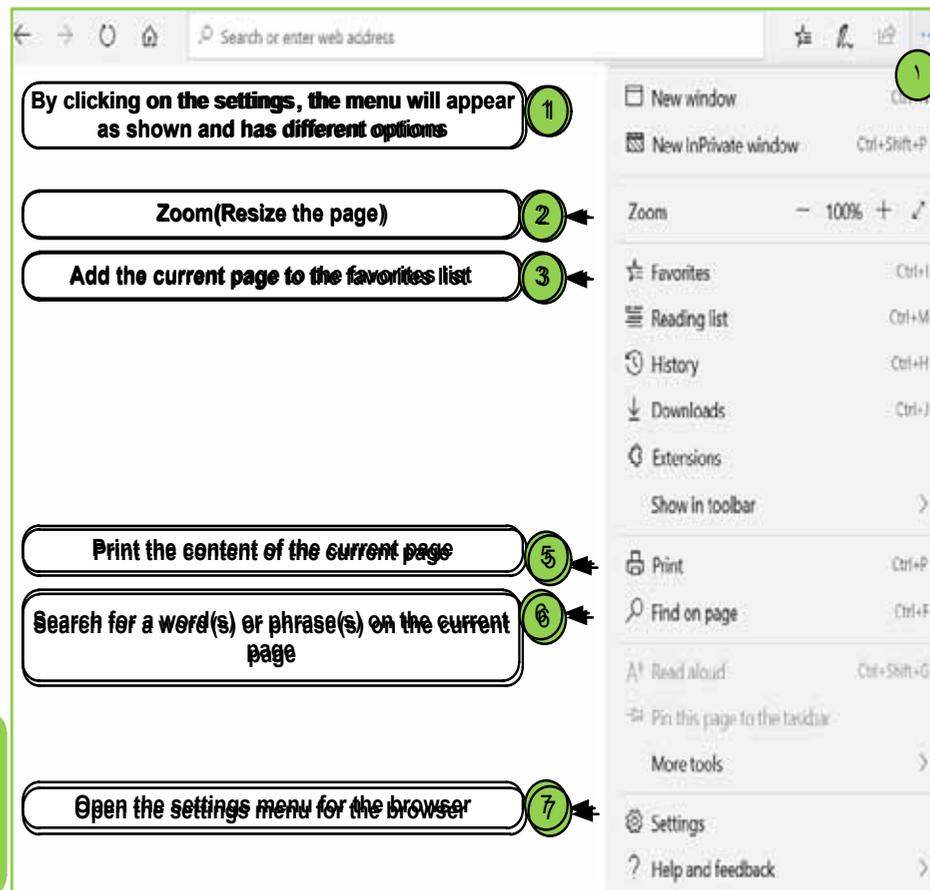
Learn the «Microsoft Edge» web browser.



The main interface of the Web browser 'Microsoft Edge' contains many elements that will make browsing easier for the user. In Figure 12.1, an illustration of the most important of these elements, numbers 1 to 12 indicates the main elements of browser usage, while element 13 is used to control browser settings.

Figure 12 -2 illustrates the most important options from the browser settings menu, through which many processes can be performed, including:

- Zoom in or Zoom out the text on the displayed page.
- Add the current page title to your favorites list.
- Search within the content of the page for a word or phrase.
- Print the content of the page on the printer.
- Access the browser settings menu.



**Figure 12-2**  
Microsoft  
Edge  
Browser  
Options

**Skill 12 - 4**  
Learn the advanced settings of Microsoft Edge.



Figures 12 -3, and 12 -4 display the advanced settings menu of the Microsoft Edge browser, in which the following items can be adjusted:

- Adjust the start page you always like to see when you open the browser.
- Import information from an old browser such as favorite sites, browsing history, passwords, etc.
- Show or hide your favorite bar on the browser page.
- Delete all or some browser data such as browsing history, stored site data, date of uploaded files, browser stored passwords, and more.
- Your personal account settings on Microsoft.

There are also many other advanced settings that can be adjusted: modifying the path of storing files loaded from the Internet, adjusting proxy settings, managing website permissions, and passwords stored in your browser.

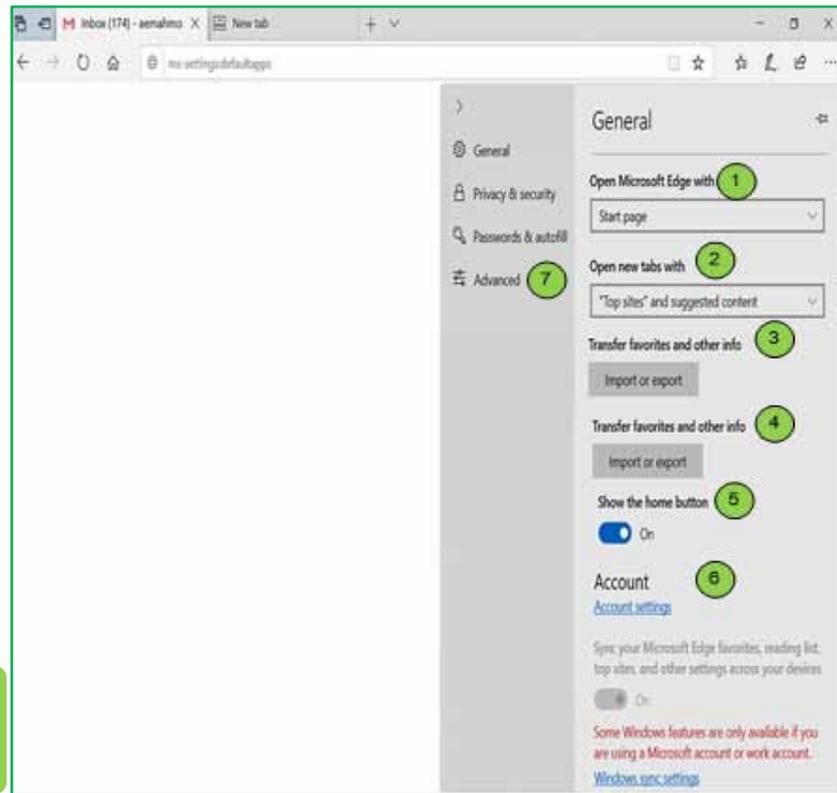


Figure 12-3  
Microsoft  
Edge  
Browser  
Settings

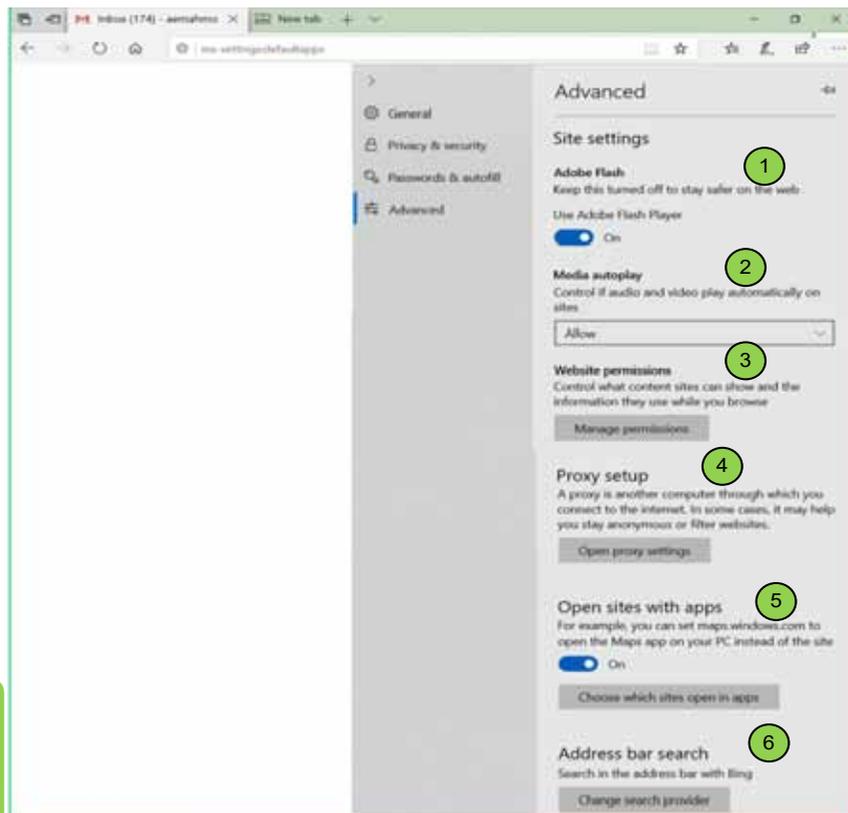


Figure 12-4  
Microsoft  
Edge  
Advanced  
Settings

**Skill 12 - 5**

Understanding the Internet Addresses and their four parts.

**12 -1 -3 Understand the Internet Addresses**

As you've been learned, the Internet address consists of four main parts: transport protocol, server, domain name, and domain extension. In practice, you have to type the address of the site you want to browse, or the computer connected to the Internet to which you want to receive or send data, in your web browser. The domain name is of great importance on the internet, and it is the fastest way to reach a particular site. For example, if you want to connect to Wikipedia, you should know the domain name of that site, which is "**Wikipedia.org**"

Also the geographic area that determines the area you want to reach a particular location on it has a significant effect. For example, if you want to contact the University of Bisha website, you should first know the domain extension "**edu**" and also the geographic area "**sa**", so "**ub.edu.sa**" is the address of the Website of BishaUniversity in Saudi Arabia. Note that "**ub**" is the server address of the University of Bisha.

You can now interpret the address of University of Bisha on the Internet:  
<http://www.ub.edu.sa>

To browse any site, you must type the address of this site in the web browser on your device and you must be connected to the Internet through a service provider.

**Skill 12 - 6**

Learn the Components of Search Engines on the Internet.

**12 -2 Internet Search Engines and Search Methods.**

Search Engine refers to a huge database of Internet resources such as web pages, newsgroups, programs, and images, etc. It helps to locate information on the web. The user can search for any information by passing a query in the form of keywords or search words. The search engine then searches for relevant information in its database and returns the results to the user.

**12.2.1 Search engine components**

As mentioned in Chapter 4, there are generally three basic components of the search engine: Web Crawler, Database, and Search Interface.

- Web Explorer: also known as Spider, a software that roams the internet to collect information.
- Database: All information on the Internet is stored in the search engine database. It consists of huge information resources on the Internet.
- Search interface: This component is an interface between the user and the database. It, therefore, helps the user search within the database.

### Skill 12 - 7

Understand how search engines work on the Internet.



#### **12 -2 -2 How the Search Engine Works**

The Web Crawler, database, and search interface are the key elements of the search engine that make it ready to work. Search engines should take advantage of logical expressions such as: and, or, not restrict or expand search results. Here are the steps that are being implemented by the search engine:

1. The search engine searches for keywords in the index of the pre-defined database instead of going directly to the web to search for keywords.
2. The web crawler software is then used to search for the information it found in its database on its websites.
3. After the web crawler finds the pages, the search engine then displays web pages related to the user's search result. The search result recovered from the search engine generally includes the page title, the size of the text part, many of the first search words, etc.
4. The user can click on any of the search results to open it.

### Skill 12 - 8

Learn about the most Popular Search Engines on the Internet.



#### **12- 2 -3 Examples of the most Popular Search Engines**

There are many search engines online, the following table shows the 10 most popular search engines by the 2017 ranking of an interested site:

Link	Search Engine	Link	Search Engine
<a href="http://www.search.aol.com">http://www.search.aol.com</a>		<a href="http://www.google.com">http://www.google.com</a>	
<a href="http://www.duckduckgo.com">http://www.duckduckgo.com</a>		<a href="http://www.bing.com">http://www.bing.com</a>	
<a href="http://www.wolframalpha.com">http://www.wolframalpha.com</a>		<a href="http://www.search.yahoo.com">http://www.search.yahoo.com</a>	
<a href="http://www.yandex.com">http://www.yandex.com</a>		<a href="http://www.baidu.com">http://www.baidu.com</a>	
<a href="http://www.webcrawler.com">http://www.webcrawler.com</a>		<a href="http://www.ask.com">http://www.ask.com</a>	

**Skill 12 - 9**  
How to Use Google Engine Serach



**12- 2- 4 How to use Google for search**

Google is the most popular search engine in the world. But while a lot of people use it, few actually get official instructions on how to search by using Google. Here are some tips on how to use Google’s search engine.

**1. Access to Google Search Engine**

To search by Google, you have to go to the Google search engine site. But did you know that there are different ways to access the site? In fact, there are even different websites for Google!

You can go directly to **Google.com** by typing **http://google.com** in your web browser. This will take you to Google’s main website, which is designed to serve the United States as well as the world generally.

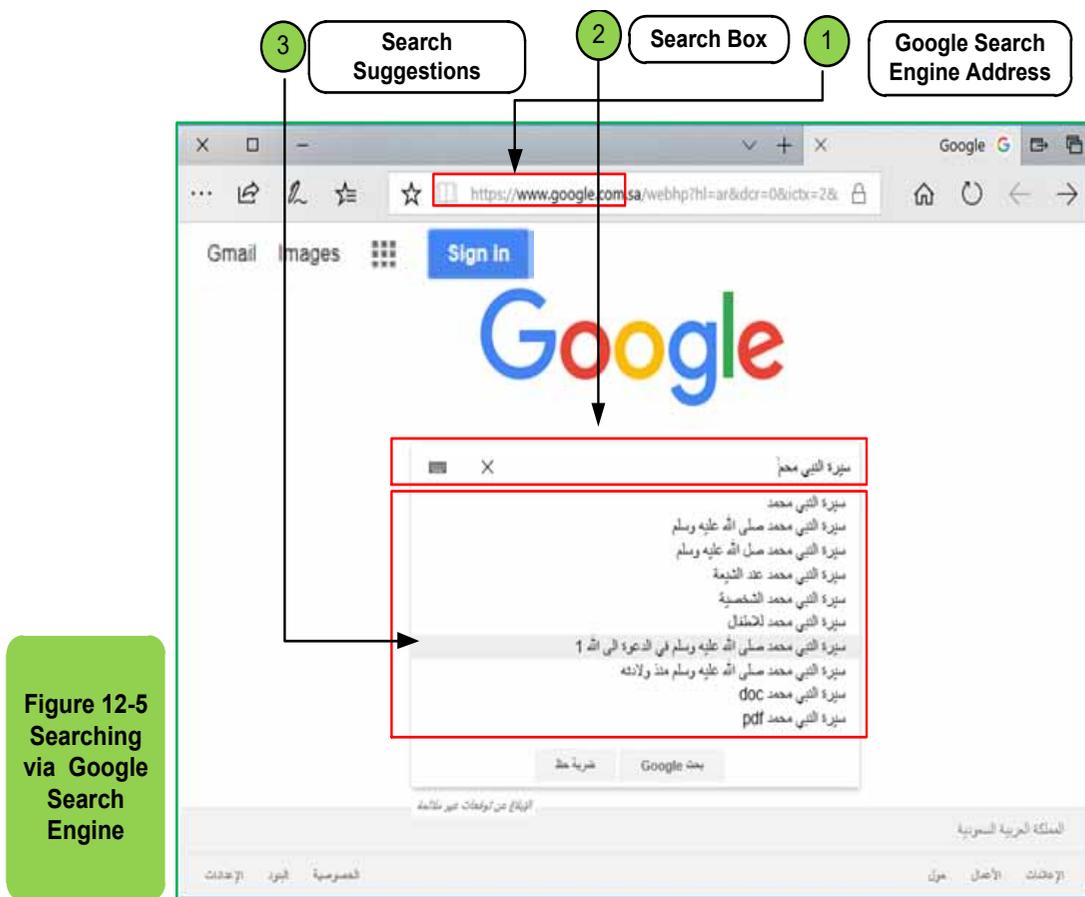
If you’re outside the United States, you might prefer to go to the Google version designed for your country. For example, if you want to go to the Google

search engine version of Saudi Arabia, write the following address in the internet browser: **www.google.sa**

Google also offers a variety of ‘vertical’ search engines, versions of Google that let you search only for certain types of materials such as photos, videos, or news. If you’re interested in such specific content, it might make sense to search one of these versions of Google search engine by directing the search — after you’ve typed search words — to the type of search to be wanted.

## 2. Enter Search Terms

In fact, searching through Google is very easy, just write down what you want to find in the search box on Google’s website or in the toolbar, as in Figure 12-5.



If you’re using the search box, while typing, you may see words appear below the search box. These suggestions Google may think may match what you care about. Google calls this auto-complete as shown in figure 125-. You can ignore suggestions, but if one of them looks useful, select it by clicking directly on it to save time.

## 3. Review the Search Results

After searching, you’ll get a page full of results. Some of these pages will be

identical to what you're looking for. You may get mixed news, photo, or video results, as shown in Figure 12 -6:

This mixing is called <simple search>, but you can specify the type of data you want to view only from photos, news, or videos through the toolbar below the search box.



Figure 12-6  
Displaying  
Search  
Results  
with Google  
Search  
Engine

#### 4- Preview Search Results

While reviewing the results, too many results will appear and it is confusing to know which results are best for what you are looking for! Google, therefore, provides a way to improve search by selecting the language, date, region, or other by advanced search settings as in Figure 12- 7.

The screenshot shows the 'Advanced Search' settings page. It is divided into two main sections: 'Find pages with...' and 'Then narrow your results by...'. The first section includes options for finding pages with all, exact, any, or none of the words, and numbers ranging from a specified value to another. The second section includes dropdown menus for language, region, last update, terms appearing, SafeSearch, file type, and usage rights. A blue 'Advanced Search' button is located at the bottom center.

Find pages with...	To do this in the search box.
all these words:	Type the important words: <code>trv-colour rat, terran</code>
this exact word or phrase:	Put exact words in quotes: <code>"rat, terran"</code>
any of these words:	Type OR between all the words you want: <code>miniature OR standard</code>
none of these words:	Put a minus sign just before words that you don't want: <code>robot, -"Jack Russell"</code>
numbers ranging from:	Put two full stops between the numbers and add a unit of measurement: <code>10..25 kg, £100..£500, 2010..2012</code>

Then narrow your results by...	
language:	Find pages in the language that you prefer.
region:	Find pages published in a particular region.
last update:	Find pages updated within the time that you specify.
site or domain:	Search one site (like <code>wikipedia.org</code> ) or limit your results to a domain like <code>edu.org</code> or <code>gov</code> .
terms appearing:	Search for terms in the whole page, page title or web address, or links to the page you're looking for.
SafeSearch:	Tell SafeSearch whether to filter sexually explicit content.
file type:	Find pages in the format that you prefer.
usage rights:	Find pages that you are free to use yourself.

Figure 12-7  
Settings of  
Google  
Advanced  
Search

## Skill 12 - 10

Learn Advanced Search Parameters in Google Search Engine.



### General Tips

General tips for starting a search in Google search engine using some parameters that determine the retrieved search results. Try using the following tags or parameters while searching:

example	explanation	Parameter
“Mohammed the prophet”	Placing the phrase you’re looking for between the two signs <>> directs Google to search for the whole phrase and not the words of the single phrase.	“statement”
Quran- interpretation	placing the sign – between the phrase and the word directs Google to search for the phrase excluding the word from the search	Statement – word
QuranOR interpretation	Placing the word OR between search words directs Google to search for any of the search words and not all words	Word ORword
allintext:Biography of Muslim Scholars	Placing word allintext: Before the search statement directs Google to find a web page where all the terms you are looking for appear in the text of that page (but not necessarily next to each other)	allintext:Statement
Arab Homeland intext:Kingdom	Placing word Intext: Before the search statement, Google is directed to find any web page where one term appears in the text of that page, and another term appears elsewhere on the page, such as the title or url.	intext:Statement
allintitle:Arab World	Placing word allintitle: Before the search term directs Google to find any web page containing certain words in the address (but not necessarily next to each other)	allintitle: Statement
Arab Homeland intitle:Dubai	Placing word Intitle: Before the search term, Google is directed to find a web page where one term appears in the title of that page, and another phrase appears elsewhere on the page, as in the text or url	Intitle: statement

example	explanation	Parameter
›Computer Components~‘ Processor	Find similar words and synonyms: Let›s say you want to include a word in your search, but you also want to include results that contain similar words or synonyms. To do this, use ~in front of the word	word~statement
‹The biggest *in the world›	Search with missing letters or words: Place * in the word or phrase you want to leave a missing element in. For example	Statement*word
‹Computer Skills› filetype:ppt	Search for specific document types: If you›re looking to find results of a particular type, you can use the filetype selector: For example, you might want to search for PowerPoint presentations related to computer skills only	Statement filetype
translate knowledge to Arabic	Translations: Do you want to translate a simple word or phrase from one language to another? No need to go to the translation site. Just look at the translation of [word] into [language].	translate [word]to [language]
New Cars location:KSA	News on a specific site: If you›re looking for news related to a particular site, you can use the location command to search Google News for news coming from that site.	location
2255 * 12.3 / 10 12 10.5 – 5.3	Calculator: The next time you need to do a quick calculation, instead of showing the micro calculator program, you can just type your expression to Google.	No*No

**Skill 12 - 11**

Use the Scientific Search of Google Search Engine.

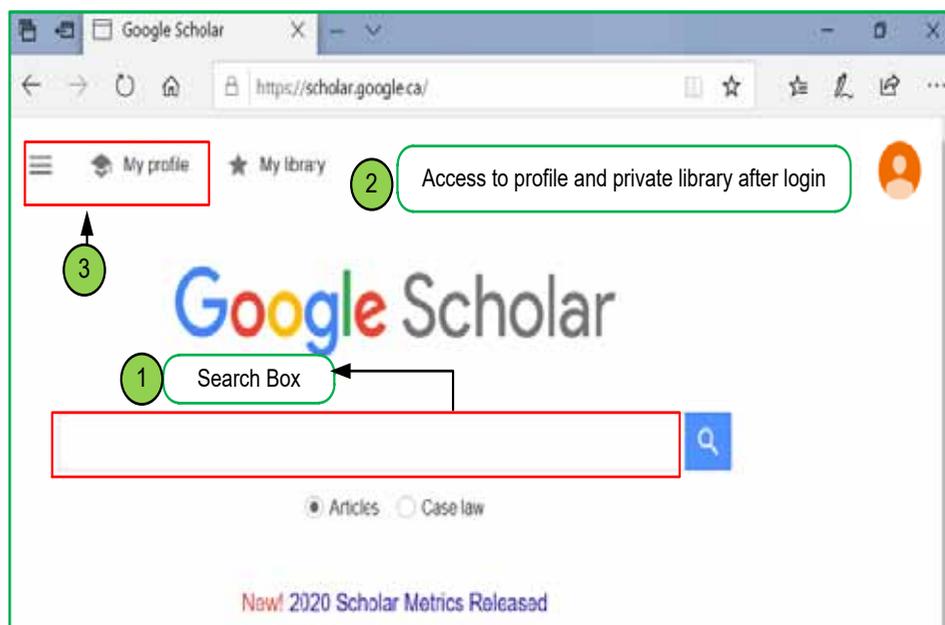


**12 -3 Search Using Google ScholarSearch Engine**

Google’s scholar searches for scientific materials including books, newspaper articles, conference papers, chapters, and scientific theses in a wide range of databases. The results are then sorted according to convenience, based on the matching of the full text, where it was published, who wrote it, and how often it was cited.

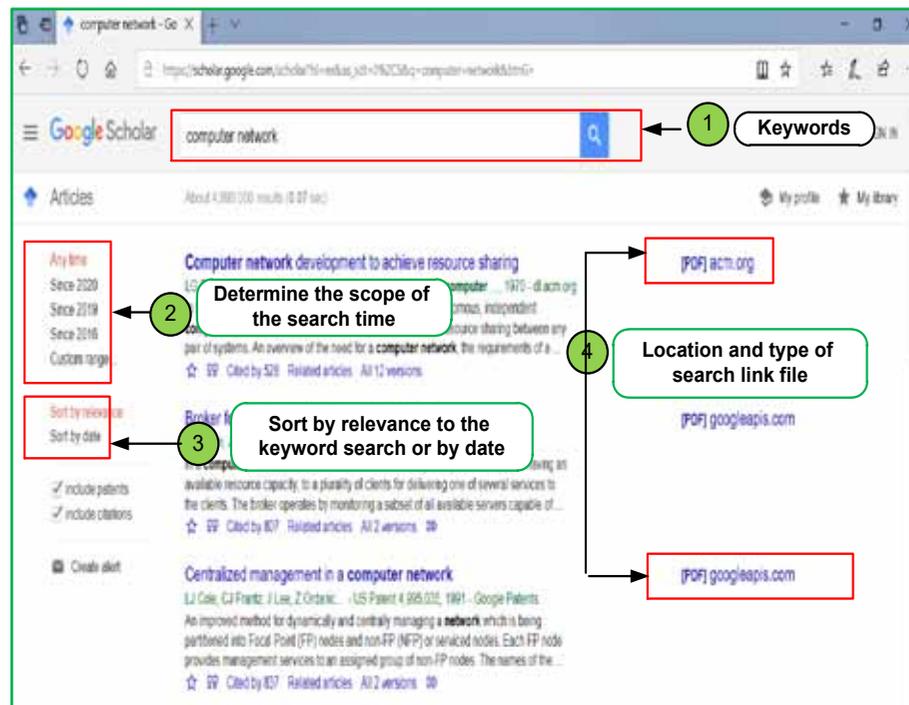
You can access the Google Scholar by typing the following address in your web browser, as in Figure 12- 8:

<https://scholar.google.com>



**Figure 12-8**  
Google  
Scholar  
Search  
Portal

Default search settings include case sensitivity in foreign languages, and search terms are automatically combined using ‘and’, and search the full text of the scientific material, including quotation as in Figure12 -9.



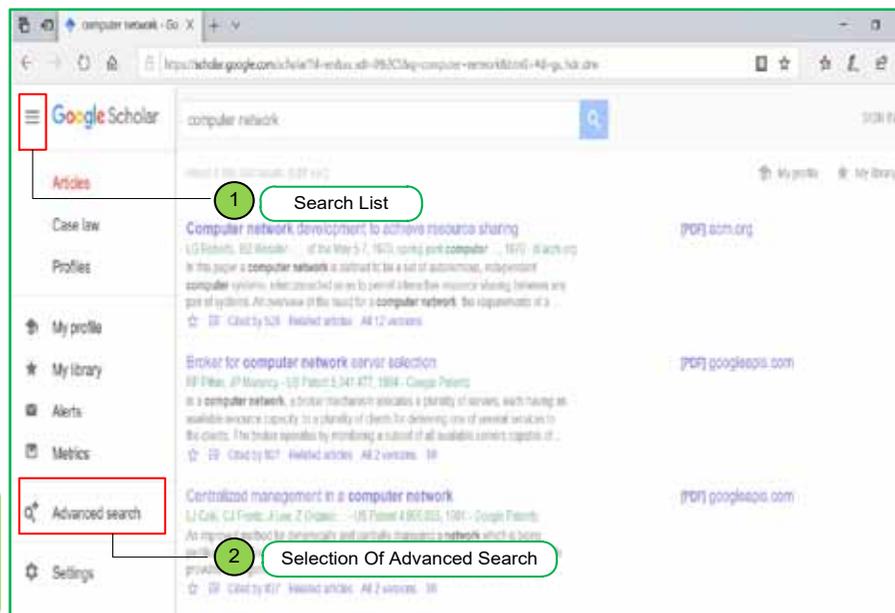
**Figure 12-9**  
An Example  
of Searching  
via Google  
Scholar

## Skill 12 - 12

The advanced search in the Google Scholar Search Engine

- Advanced Search in the Google Scholar**

The following screen provides more ways to improve your search, including searching within a particular publication. Click on the search menu to the right of the search box to view advanced scientific search options, as in Figure 12-10.



**Figure 12-10**  
Advanced  
Search in  
Google  
Scholar

You can improve your search by viewing only results that contain all search words, contain the entire phrase, or contain search words only in the title, articles that contain search words for a specific author, or in a particular year or period of time, and so on, as shown in Figure 12- 11.

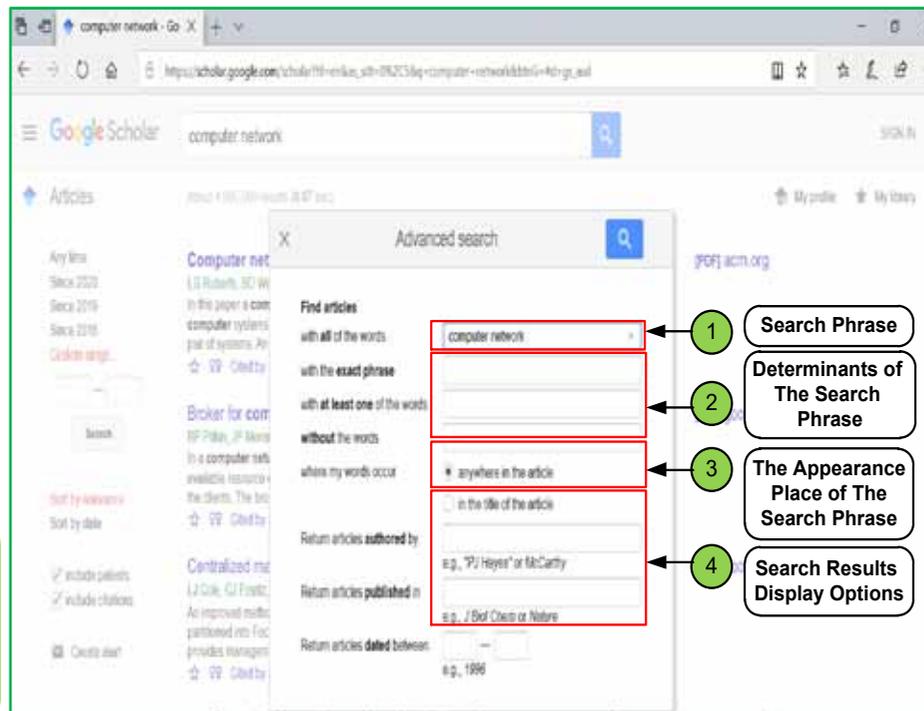


Figure 12-11  
Advanced Search Options in Google Scholar

### Skill 12 - 13 Learn about Wikipedia



## 12.4 Wikipedia

### 12.4.1 Historical View

According to Wikipedia’s self-definition on its website, ‘Wikipedia is a free, multilingual, free-content digital encyclopedia project created by volunteers, consisting of articles written in a particular style, where anyone can edit it without registration, and anyone can take advantage of the content, and exploit it for commercial or other purposes in accordance with the encyclopedia’s license. Wikipedia’s development is endlessly scientific process. If you write something good, it may still exist for many centuries, read by people from all over the world. It can also be developed or corrected in new reviews of other users. Part of the fun and challenge of editing here is watching the changes that happen to your adjustments over time’.

It's worth noting that «Wikipedia has no particular point of view, and does not specify what's «true». Rather, editors are looking to summarize what good sources have said about ideas and information. The different points of view are presented objectively and without prejudice, as mentioned in reliable sources, those sources that have a reputation for being accurate. Good sources are the basis of the encyclopedia; anyone should be able to verify whether they really support the information that has been added. This is usually done by citing the source from which the information was taken.»

Since Wikipedia was established in 2001, it has grown rapidly to become one of the largest websites on the Internet, attracting more than 100 million visitors per month, in October 2014. The Arabic version of the free encyclopedia began in July 2003 and is still in the process of building content, so any modification or addition, however simple it may seem, is of great value to this encyclopedia. The Arabs Wikipedia ranks approximately the 19<sup>th</sup> among the world's largest Wikipedias by the number of articles and receives 1.0% of the visitors of Wikipedia. Nevertheless, it covers a gap for Arabic-speaking users, and the Arabs Wikipedia plays this role because of the poor of arabic-quality encyclopedias in the form of volumes in the Arab world

## Skill 12 - 14 How to Browse Wikipedia



### **12.4.2- Browsing Wikipedia**

Wikipedia pages are divided into several ranges for each domain (except the main one) a particular prefix that appears with two points at the beginning of page names. You can search by scope using the Wikipedia search tool. Topics that users write in the inappropriate domain are deleted or corrected. Some of the most important domains in Wikipedia include:

- **Article:** This range includes the contents of the encyclopedia that must be supported by sources.
- **Discussion:** Each article has its own discussion page that is used for discussion and cooperation to develop it. You can access the discussion page of any article by clicking on the word « discussion ».
- **User:** Users' profile pages. Each user has his own page that appears at the top left. On your profile, you can identify yourself and your goals on Wikipedia.

- **User Discussion:** Everyone who contributes to Wikipedia has its own discussion page. On this page, anyone can leave a message. Others can ask him some questions or give him some advice.
- **Wikipedia:** Includes policy and guidance pages, and key pages such as Wikipedia Field, Wiki projects, and Wikipedia information pages. These pages are very useful and important, so they should not be written or edited — especially policies and guidelines — only after the discussion of other editors.
- **Classification:** This domain is used to collect many closely related pages. The accuracy should be investigated when classifying any article.
- **File:** Files such as photos, audio clips, etc. are stored in detail and licenses. The file page name is the same as the file name.

You can browse the encyclopedia’s website in Arabic by typing the following address in your internet browser as in Figure 12- 12:

<https://ar.wikipedia.org/>

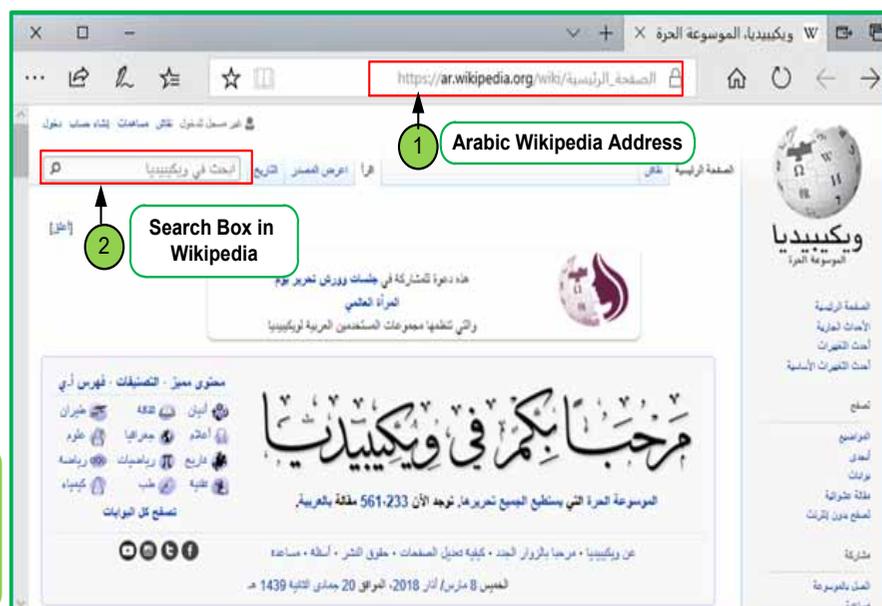


Figure 12-12  
Arabic  
Wikipedia  
Website

You can simply type the search words for a topic in the search box and then click the Enterkey. The encyclopedia ser search engine searches for articles that contain your search words and displays search results in the form of successive links. Note that you can see the total number of links retrieved from the search through the results, as well as the date and time of the last edit on each article through the information below each link. You can also do anadvanced subject search by clicking ‘Advanced’ where different search ranges appear that let you choose the specific ranges you want to search for, as in Figure 1213-. You can

also browse multimedia files related to the subject of the search by clicking on 'Multimedia.'

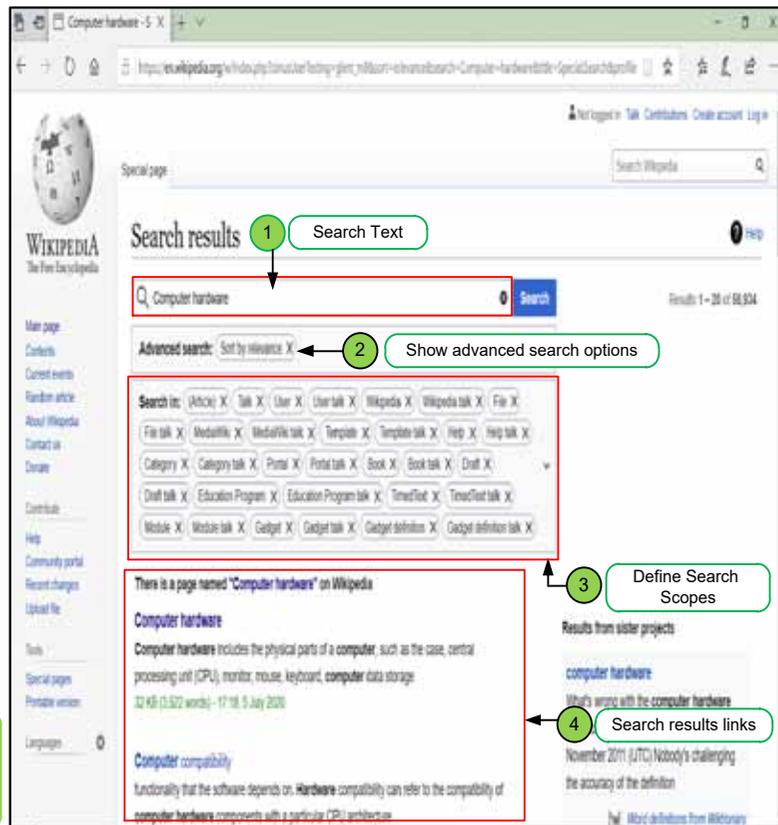


Figure 12-13  
Advanced  
Search in  
Wikipedia

By clicking on the link that indicates the subject of your search, you can view the content of the topic from the encyclopedia, as shown in Figure 12-14.

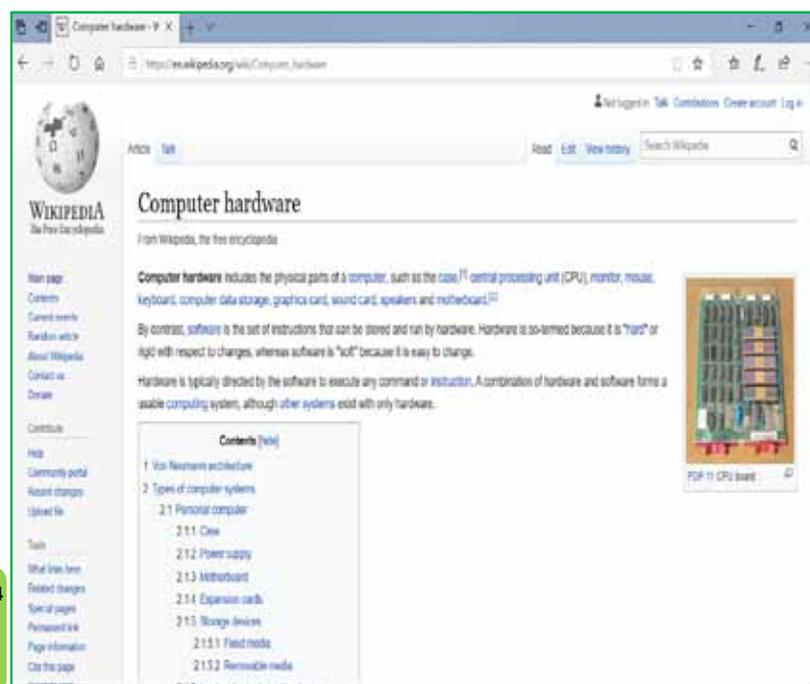


Figure 12-14  
Example of  
a Topic in  
Wikipedia

### Skill 12 - 15

## How to Create an Account on Wikipedia



### 12.4.3 Create an Account on Wikipedia

You should open an account when you have useful information that you need sharing with other Wikipedia users. The registration process is quick and free and does not require any personal information, and the registration process is useful for a number of reasons, including:

- The ability to create a special page to identify yourself, called a user page.
- The ability to create new pages and free partially protected pages.
- The ability to move and rename pages.
- Freedom to choose the username you wish, as the name is available and appropriate.
- The ability to see and review your contributions to the encyclopedia through the user contributions page.
- The ability to add pages that interest you to your watch page for updates.
- The possibility of promoting to become an administration in the encyclopedia.

To create an account, you must click on 'Create an Account' and continue to fill the fields in Figure 12- 15

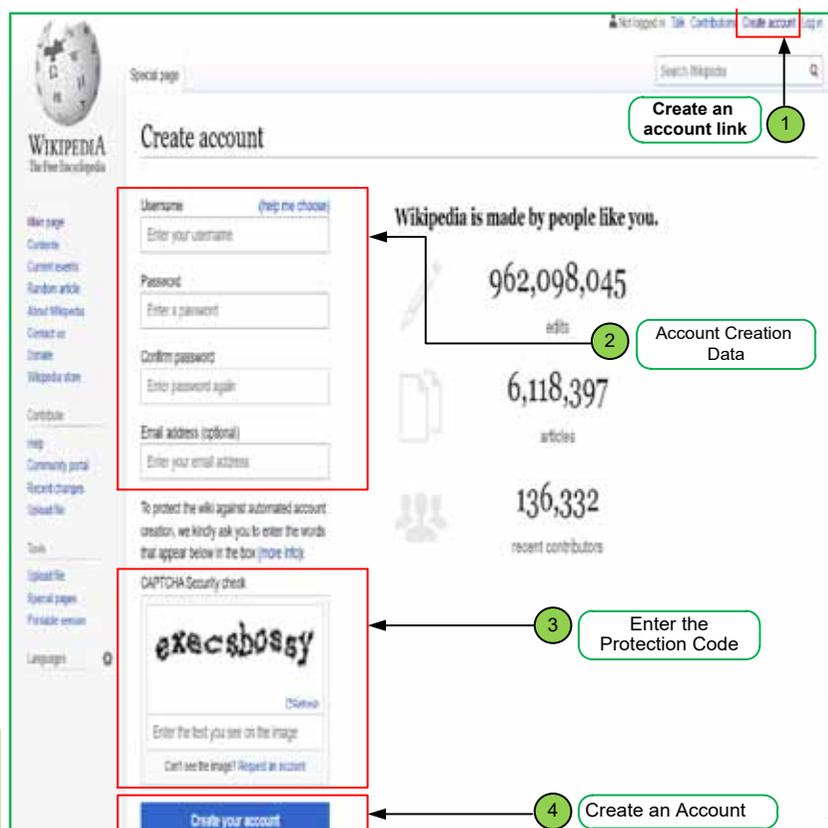


Figure 12-15  
Create a  
Wikipedia  
Account

## Skill 12 - 16

Learn the Digital Library and its Importance at Bisha University.



### 12- 5 Digital Library

Digital Library Definition: It is an online database of digital entities that can include text, still images, audio, video, or other different digital media formats. In addition to storing digital content, digital libraries provide ways to organize and retrieve search and recover content in databases.

Digital libraries can vary greatly in size and scope and can be spent by individuals or organizations. Digital content may be stored locally or remotely accessed over computer networks. These information retrieval systems can share information among themselves through mutual operation and sustainability.

It also provides a digital environment for the various categories of university staff, and their research entities, and in this environment a lot of benefits that cannot be ignored, including:

- **No Place limits:** A digital library user doesn't actually need to go to the library;
- **No time limits:** The main advantage of digital libraries is that people have access to information 24 hours a day/7 days a week.
- **Multiple uses:** The same resources can be used simultaneously by a number of organizations and sponsors.
- **Ease of retrieval of information:** The user can use any search term (word, sentence, title, name, subject) to search the entire group. Digital libraries can provide very user-friendly interfaces, allowing access to their resources.
- **Protection and save:** The various information in databases is stored in digital form. Digitization is a solution to provide copies of materials that can be degraded and damaged by repeated use.
- **Storage space:** While traditional libraries are limited by storage space, digital libraries have the ability to store a lot of information, simply because digital information requires very little physical space to contain, and media storage technologies are less expensive than ever.
- **Easy of access:** You just need a computer and internet.



Figure 12-16  
Interface of  
Digital  
Library at  
the  
University  
of Bisha  
Website

### Skill 12 - 17

How to Access the Digital Library at Bisha University.



#### 12.5.1 The Digital Library of Bisha University and How to Access It

The Portal for Library Affairs at Bisha University currently provides access to information bases and electronic sources covering almost all academic fields, through direct links to the information bases of the Saudi Digital Library SDL is one of the largest scientific database of information sources in the Arab world, with more than 310,000 scientific references covering all academic disciplines, and continuously updating this content, thus achieving significant knowledge enrichment in the long run.

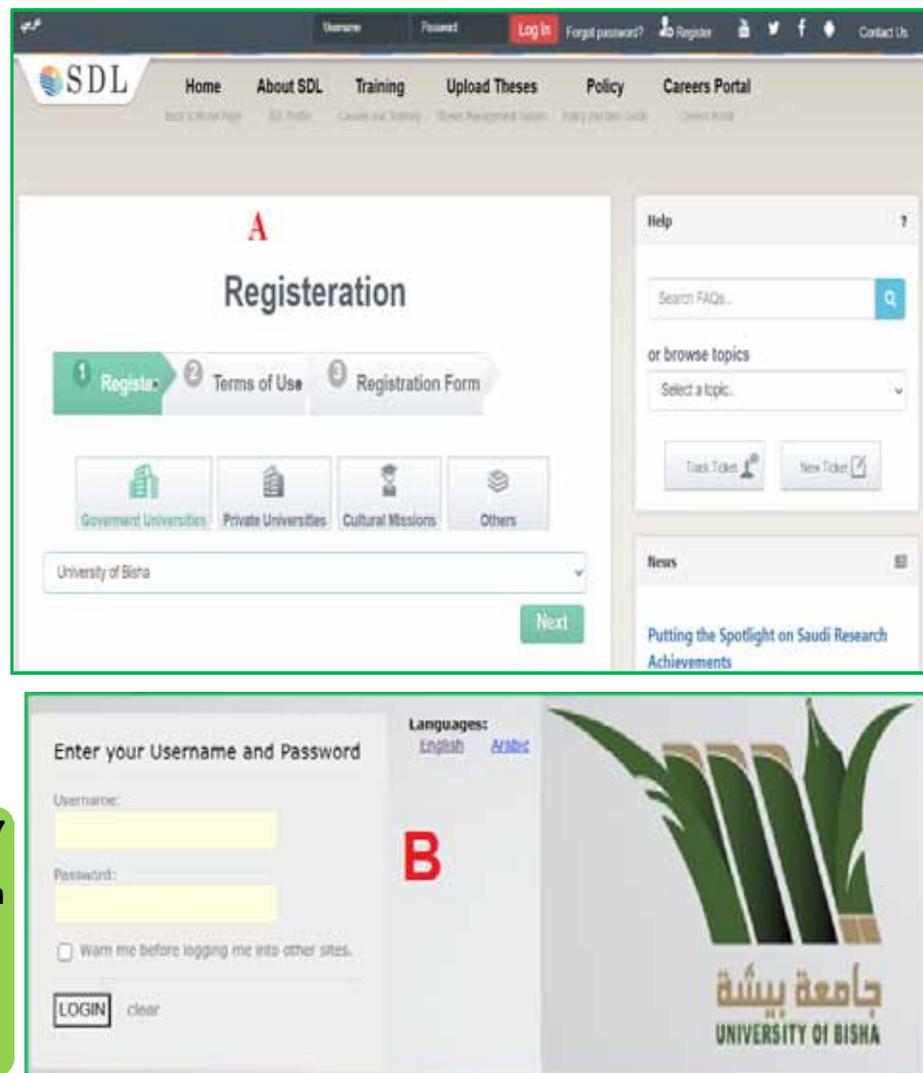
The Portal at Bisha University also provides a unified search feature using EBSCO Discovery Service (EDS), one of the world's most popular information services companies.

Through the Bisha University portal and the deanship tab, on the Deanship of Library Affairs page, you can find the link to access the digital library, or directly from the following link:

<https://:ub.deepknowledge.io/Bisha>

The digital library homepage as shown in Figure 12-16, in which you will find the possibility to register a new account if you are a university student, or access your account if you have registered and have a previously activated account.

You can choose your preferred language from two languages, Arabic or English, as a browsing interface. There is also the possibility of a unified search of all available sources of information through a single search box that allows you to obtain results that match your search words, even if you are not registered. But in this case, you won't be able to access the full text of all search results.



**Figure 12-17**  
The  
Registration  
Pages  
through  
Bisha  
University  
Account

### Skill 12 - 18

How to Register in the Digital Library of Bisha University.



#### 12- 5 -2 Sign in and Search the Electronic Library

It should be noted that the registration for a digital library is available to students at Bisha University. There are many services available to account holders, the most important of which is the possibility of obtaining the full text free of charge from the various sources of information. You can register by clicking on the 'Register a New Account' link and fill in the required data as in Figure 12 -17.

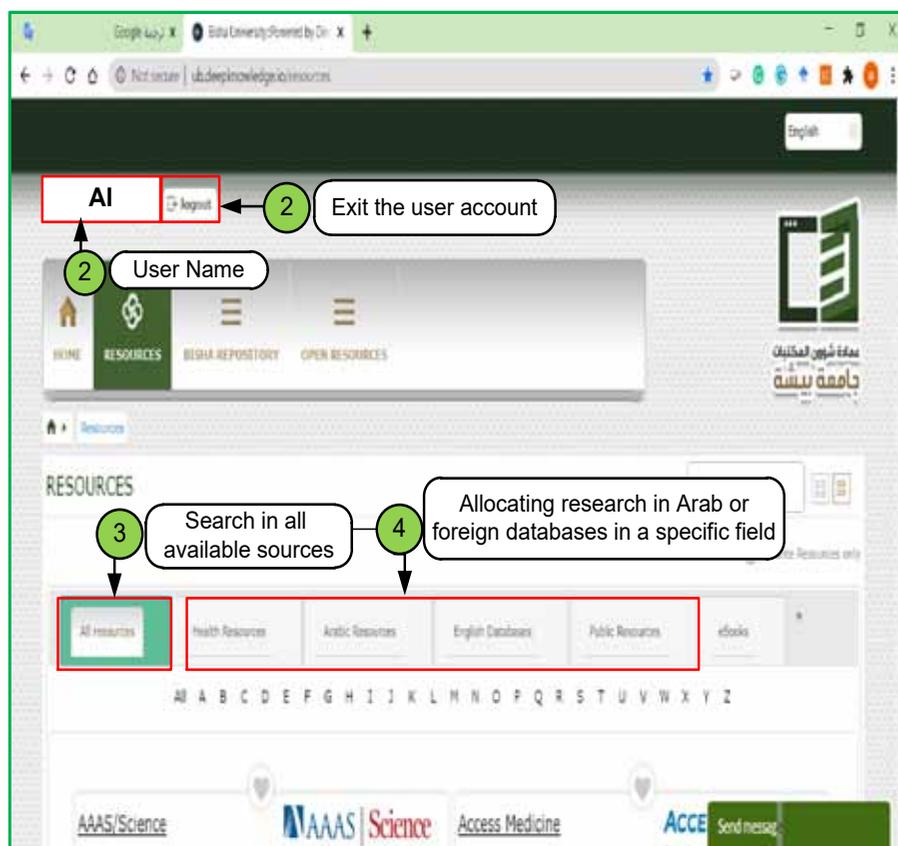


Figure 12-18 Searching in the Saudi Digital Library

### Skill 12 - 19

How to Search the Digital Library.



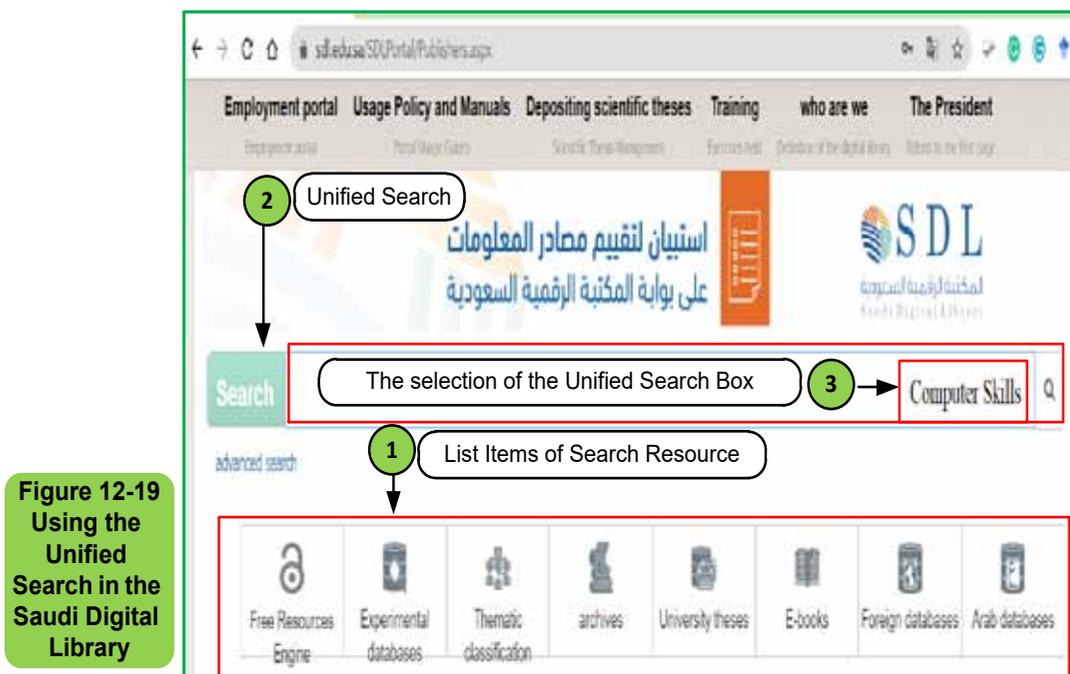
After signing in and getting an active account, the search page lets you expand your search to all available sources of information in the library, or customize searching Arabic or foreign databases in a particular discipline as shown in Figure 1218-. Expanding the search into all Arabic sources, for example, retrieves

everything that matches your search words in Arabic only from all available sources, as opposed to the allocation of search words in pure science, engineering, or computer science in English, which retrieves everything that corresponds to your search words in English only in specific sources.

To search for sources of information, whether all sources or specific sources follow the following steps:

1. Click on the login link as in Figure 1216- and enter the username and password.
2. Click the menu button as in Figure 1219- showing you the elements of the selection list of sources.
3. Choose a unified search (for example) or select the source you want to search.
4. Write the search words in the search box as in Figure12.19-
5. Click on the word 'Search' next to the search box.

The search engine retrieves all topics related to your search words in the form of arranged links; you can click on any of them to see the contents of the link.



### Skill 12 - 20

How to improve the Search result in the Digital Library.



#### 12 -5- 3 Improve and Order Search Results

To improve search results, and get what you want easily and quickly, you can click on the drop-down menu to the right of the search box to determine the scope of thesearch for keywords entered in one of the following elements:

1. **Full Text** if you want the full text of the scientific material.
2. **Author** if you are looking for the literature of a particular person.
3. **Title** if you want to search for topics title only.
4. **Subject Terms** if you want to search for specific vocabulary for a specific topic.
5. **Source** to determine the search for a specific source of information.
6. **Abstract Summary** if you want to search summaries only.

In determining the source, you can choose to search the books recorded in the database and located in the actual library of the university, e-books, or research articles in international journals etc, as shown in Figure 12. 20-

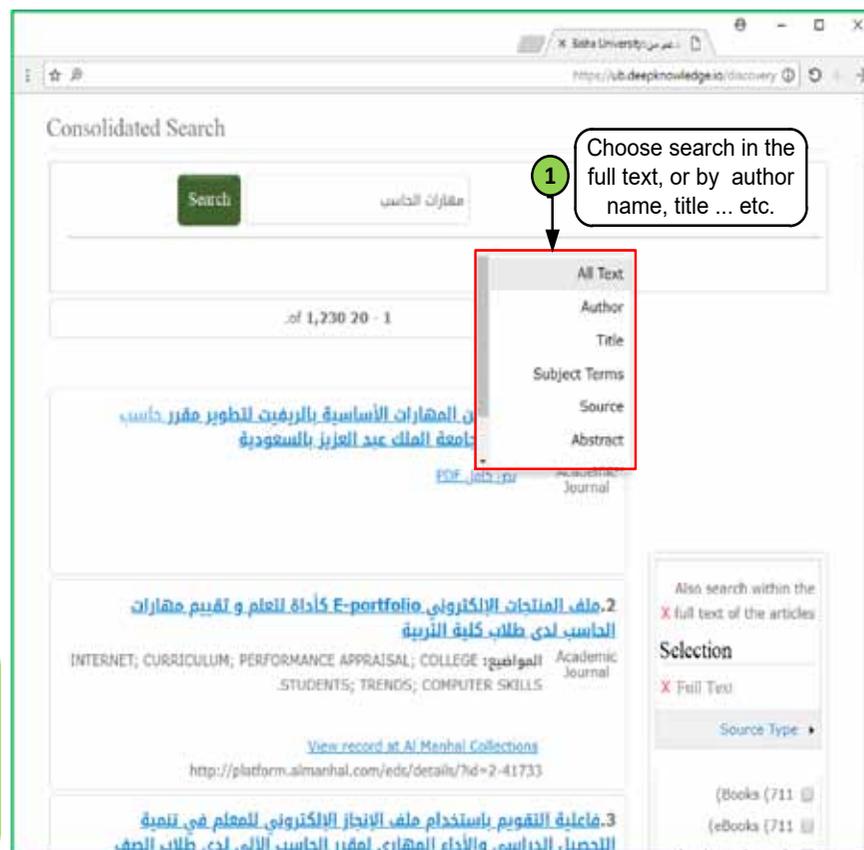


Figure 12-20  
Improving the  
Unified Search  
Results in the  
Saudi Digital  
Library

### Skill 12 - 21

#### How to Arrange a Search Result in a Digital Library.



You can arrange the search result after the result has been improved (or earlier), so that you see search results ordered according to their importance relative to search words, the most recent date first, the older date first, etc. This makes it easy for you to get the desired result at the beginning of viewing the results list, as in Figure 12- 21.

You can also control the way search results are displayed in terms of the information displayed for each item. In the default mode of the view, each search result is displayed as a link with the title of the result and directly below the main theme followed by that result, and a link to get the full text in pdf format. But you can change the view so that you get a summary of each item in the search result, or view more details about the item.

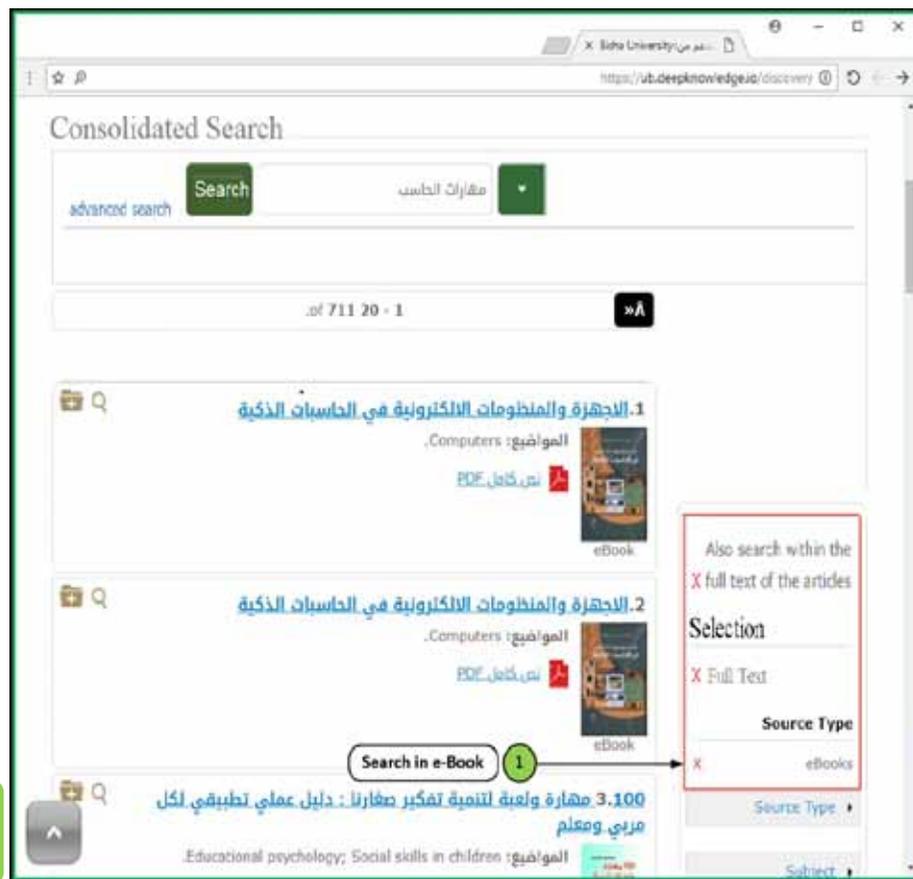


Figure 12-21  
Searching  
e-Books

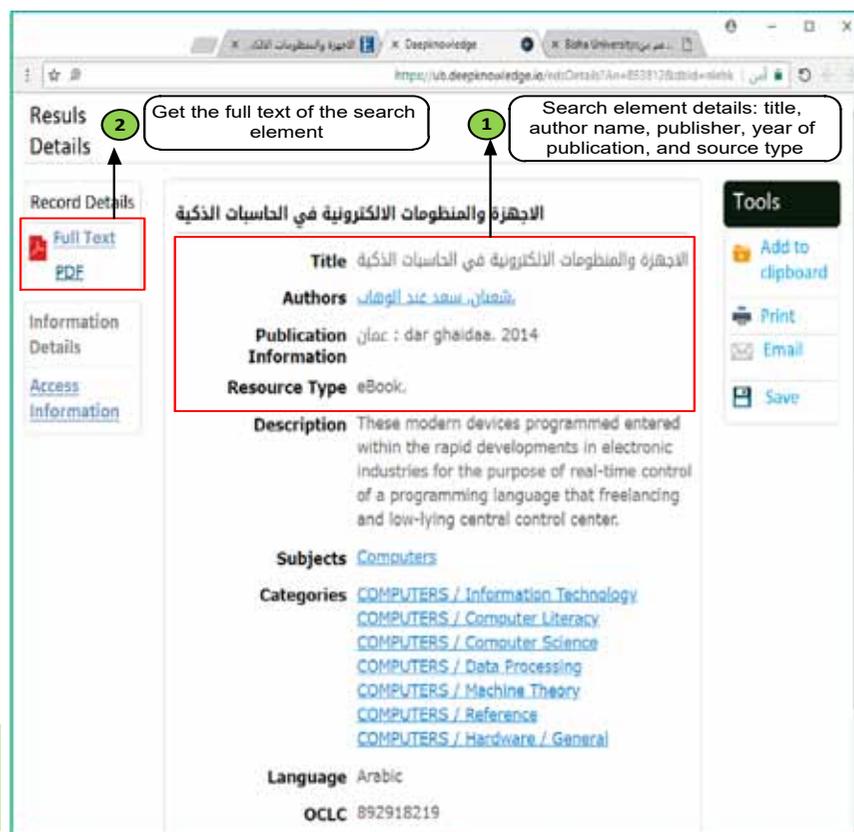
### Skill 12 - 22

How to Get the Full Text of a Search Result in a Digital Library.



**To get the full text, you should follow these steps:**

1. Click on the link to the title of the search item from the list of results, and the web browser will go to the search item description page with information on: item address, author, publisher, year of publication, source type (e-book as example), summary of the item, subject of that item, language and so on. Also to the left of the window is a link to the full text under the words 'Record Details' as in Figure 12- 22.
2. Click on the full text link, the web browser will move to the first page of the source (e.g., e-book), and on the left of the window you will find a small box (as in Figure 12 -23) in which the requested part of the source can be selected.
3. Start requesting the download by clicking on the downward arrow and the last window will appear to download the desired part, as in Figure12- 24, in which the number of pages to be downloaded is determined so that the total of all pages does not exceed 100 pages, and then click on Download PDF to download the file on your computer.



**Figure 12-22**  
Browsing the  
Search  
Results

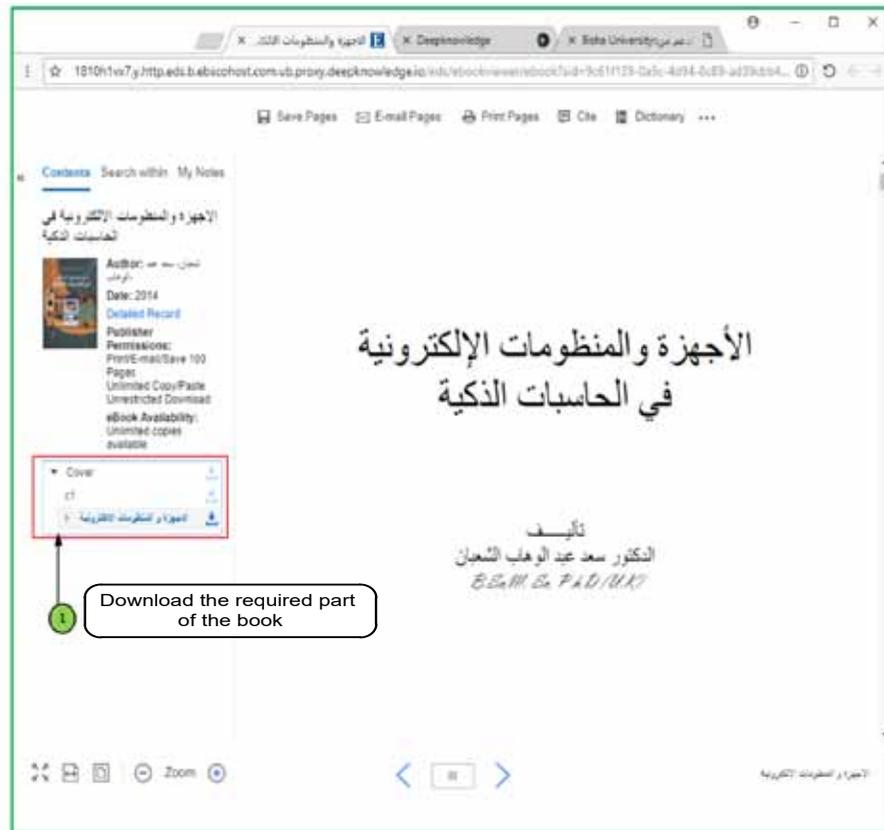


Figure 12-23  
Down the File  
of the Re

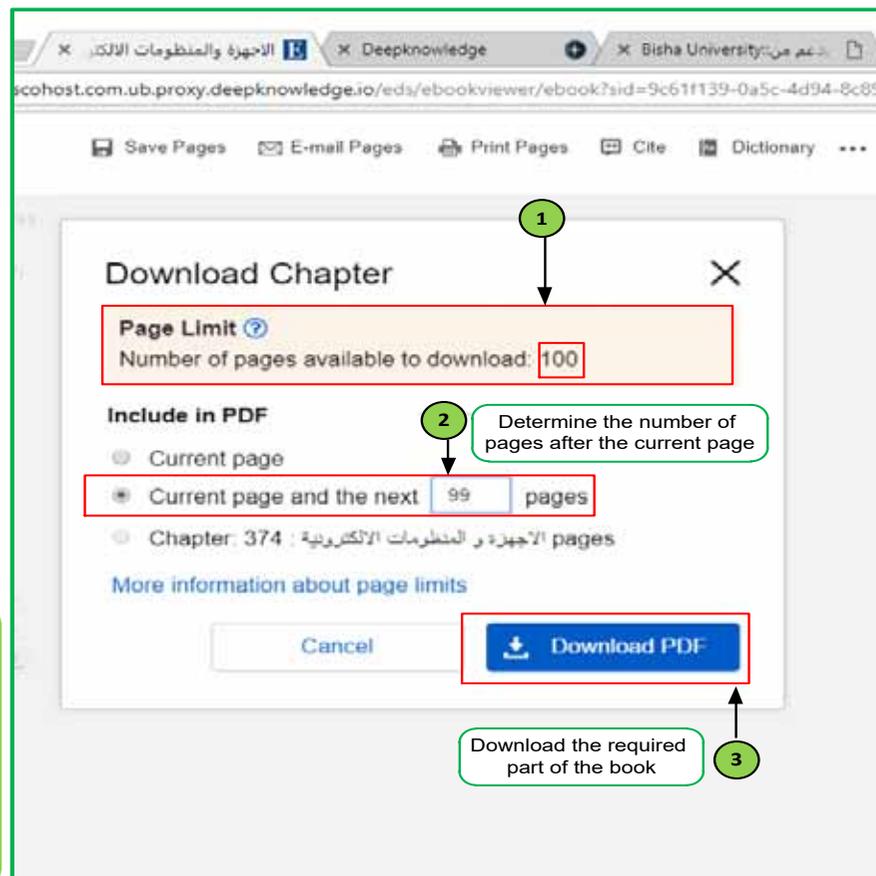


Figure 12-24  
Specifying the  
Selected  
Pages'  
Numbers to be  
Downloaded  
from a Certain  
Book at a  
Single Period  
of Time

# Chapter 13

## The Blackboard







## *The Blackboard*

### Objectives

#### ➔ Main objectives:

1. Learn about the blackboard e-learning management system.
2. Learn about the virtual classrooms.

#### ➔ Secondary objectives

After studying this chapter, the student is expected to master the following knowledge and skills:

1. Learn about the advantages of the blackboard e-learning management system.
2. Sign into the blackboard at Bisha University.
3. Learn about the different elements of the blackboard home home page.
4. View the contents of a course on the blackboard.
5. Completion of tests and assignments of course on the blackboard.
6. Access to the virtual classrooms.
7. Retrieve saved virtual classrooms



### 13 - 1 An introduction to the electronic learning management system “Blackboard”

The Blackboard system is an e-learning management system. It is characterized by managing the educational process in a synchronous and asynchronous manner, as the “Blackboard” system provides a safe educational environment. In this environment, instructors provide courses in an attractive way. This environment also allows students to interact with the instructor and with each other using a set of integrated tools that provide great opportunities for students to have continuous access to the course outside the lecture class anywhere and at any time outside the university campuses.

#### Skill 13- 1

#### Recognizing the Advantages of the Blackboard System



### 13- 2 Advantages of the e-learning management system “Blackboard”

The e-learning system “Blackboard” is not a free system and has many advantages, including:

1. It provides many tools and means for communication between the course instructor and his students in the course.
2. Giving the instructor the ability to build the educational content as desired, whether it is educational pages, units, or others.
3. It provides many advantages for the instructor in setting the tests electronically, including helping him to put questions of different types such as multiple-choice, true or false and many other types.
4. It gives the advantage of following the student from the beginning of his sign into the system until he logs out every time he signs in.
5. It uses a variety of means to display the educational content using multimedia such as text, images, audio, and video.
6. The system provides the advantage of live, direct conversation between members of the group through virtual classrooms, and the instructors are able to manage these conversations, and the system creates an archive of everything that was written in these conversations so that it is easy to refer to it when needed.
7. It enables the submission of assignments and surveys and effectively receive student responses electronically.

**Skill 13 - 2**  
Signing in to Blackboard



**13- 3 Signing in to the Blackboard**

*You can sign in to the “Blackboard” through the following:*

- Enter through the link <https://lms.uob.edu.sa> or through the Bisha University portal on the Internet <http://www.uob.edu.sa/> then choose "Blackboard" from the students' tab.
- The “Blackboard” system login page and login information for Bisha University students appear to you as follows:
  - Username / write the student's university ID.
  - Password / write the student's civil registry ID.
  - Then click on Login as in Figure 131- provided that the username and password are written in English.



**Figure 13-1**  
Login to the  
Blackboard

**Skill 13- 3**  
Recognizing the Home Page of Blackboard System



### 13-4 Home Page of the Blackboard System

In this section, we will learn about the contents of the home page of the electronic learning system, “Blackboard”, as the system provides through the home page a set of tools to facilitate the process of interaction between the student and the courses that he is studying, as shown in Figure 13 -2.



**Figure 13-2**  
The  
Blackboard  
Home Page

The home page of the electronic learning management system “Blackboard” contains the following components:

1. **“Global Navigation Menu”**: The e-learning management system provides the Global Navigation Menu for quick and timely access to information for the university and courses and follow-up the evaluation and It shows:

- The student name.
- The notification box appears in red, and it has the number of alerts to follow.
- Logout from the system

2. **“Home Page”**: It contains the Add Module, from which you can add and delete modules (will be explained in detail in a later section), and it contains a “Personalize Page” button to choose the screen format for the student from a set of options available in “Blackboard.”

3. **“Tools”**: From there you can see many messages and notifications as it contains many general tools such as:

- Announcements: It shows the university announcements and course announcements for the student within the group of registered courses for the student.
- My Grades: The student's grades recorded on "Blackboard" are displayed for the courses that the instructor has registered on the "Blackboard".
- Calendar: View events, homework times, tests, and more.

4. **“My Courses”**: from which the student can view a list of courses that he/she is studying.

### Global Navigation Menu

- To open the global navigation menu, we click on the small arrow next to the username as in Figure 13 -3.



Figure 13-3  
Public  
Navigation  
Menu

- After clicking on the small arrow in the global navigation menu, a list will appear for you, as in Figure 13 -4, which contains:

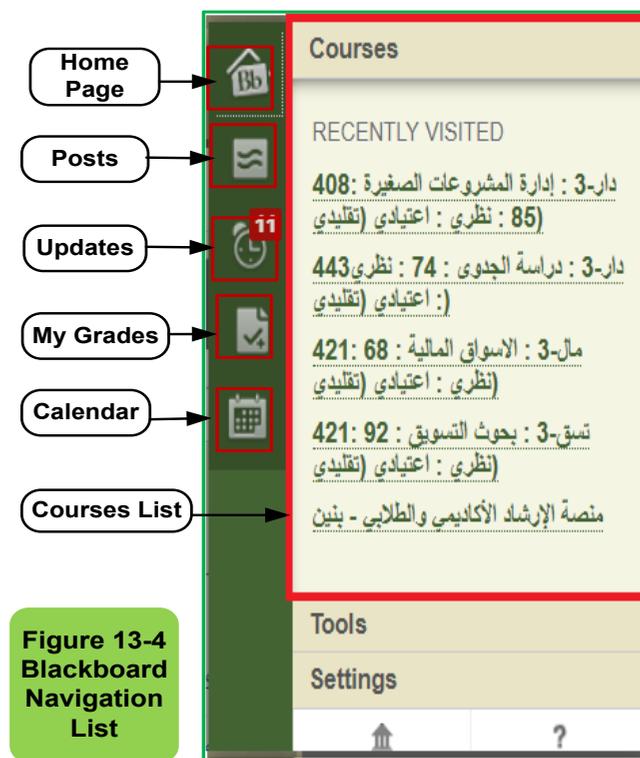


Figure 13-4  
Blackboard  
Navigation  
List

**1. Bb Home:** Click on the icon of the Bb home, which contains the latest posts from instructors on the “Blackboard” system, as in Figure 13- 5.

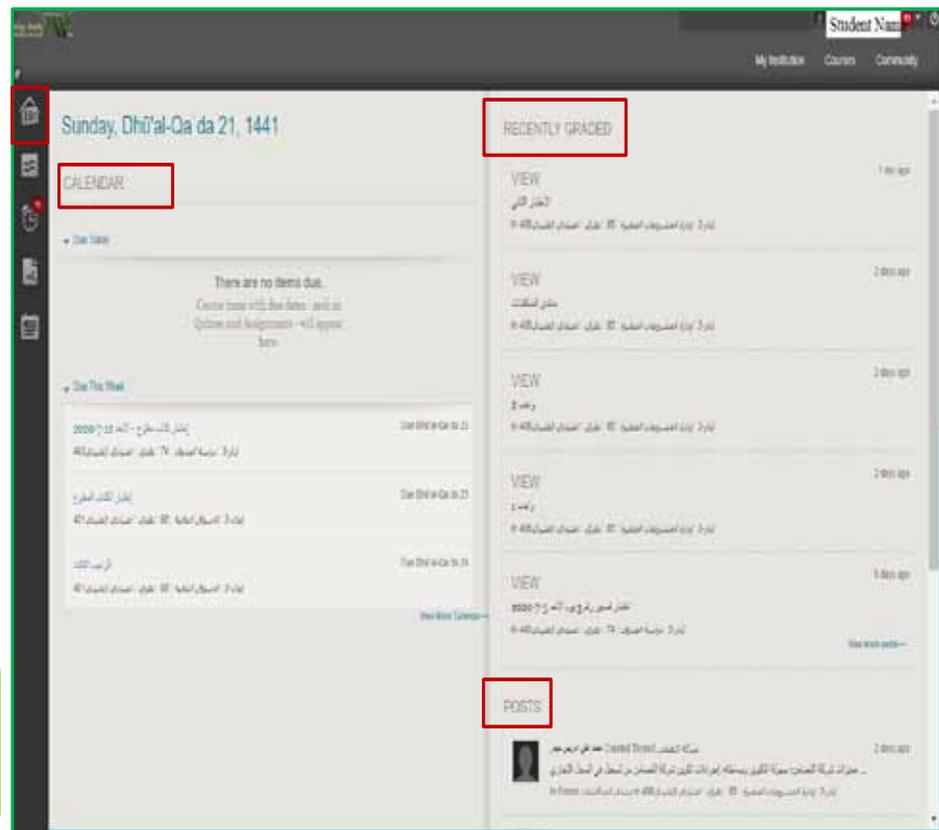


Figure 13-5  
Blackboard  
Home Page

**2. Posts Icon:** Click on the posts icon to view the latest available posts in the “Blackboard” system, as well as the posts for all the courses that the student is studying, as in Figure 136-. Select the post you want to view from the left side of the window, and you can reply to this post by clicking on the “Reply” button. A window will appear with the reply title. Enter the reply to the post in the message box. You can also attach a file. After completing the response, click the “Submit” button.

**Skill 13- 4**  
Recognizing Posts and Announcements for courses  
and their reply





Figure 13-6  
Posts List

**3. Updates icon:** Click on the updates icon to go to the updates page, which contains all notifications in the “Blackboard” system and in the courses such as meals and surveys; the updates for all courses can all be viewed at once, or browsed according to the courses as in Figure 13- 7.

**Skill 13- 5**  
Browsing the Courses Announcements of  
Asignments, Surveys and Other

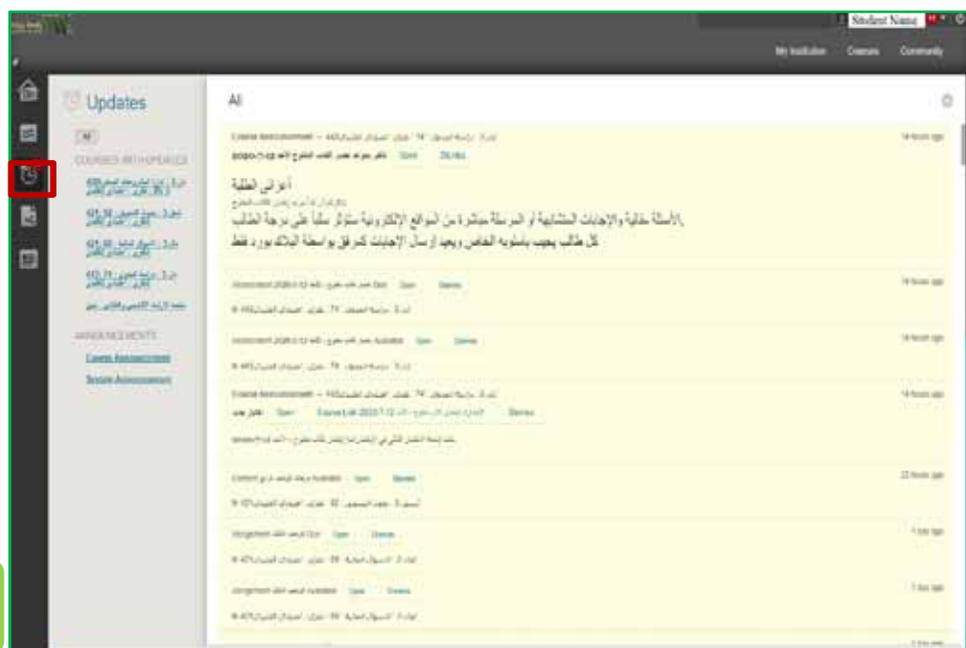
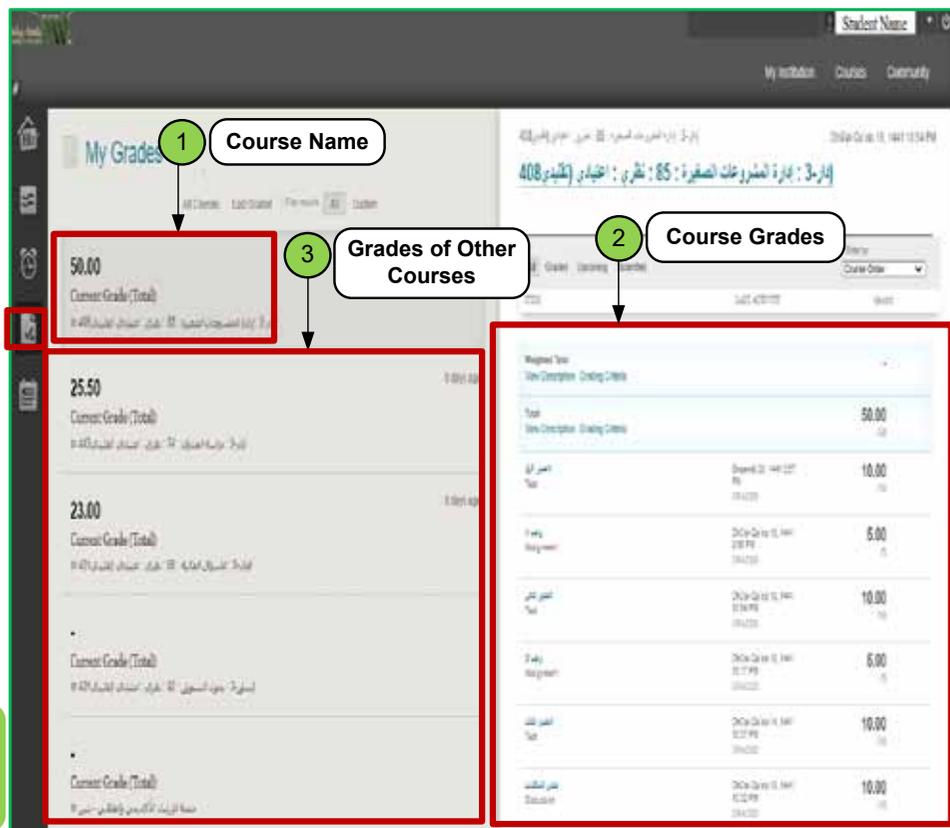


Figure 13-7  
Updates  
List

**4. My Grades icon:** Click on the My Grades icon to go to the grades page, which provides a way for the student to know the grades of the various courses that he/she is studying and inserted by the courses instructors on the “Blackboard” as in Figure 13 -8.

**Skill 13- 6**  
Browsing the Courses Grades recorded on the Blackboard

**Figure 13-8**  
Student Grades

**5. Calendar:** Click on the Calendar icon to switch to the Calendar tool on the Blackboard e-learning management system; that enables the student to view the various events, and the calendar tool can also be opened from the system’s home page by clicking on the “Calendar” button. Upon opening the Calendar window, the events of the university and all the courses that the student studies, and your recorded personal events are displayed and you can browse the events by day, week, or month, as in Figure 139-. You can also create a new event.

Skill 13 - 7  
Creat New Event in the Calender

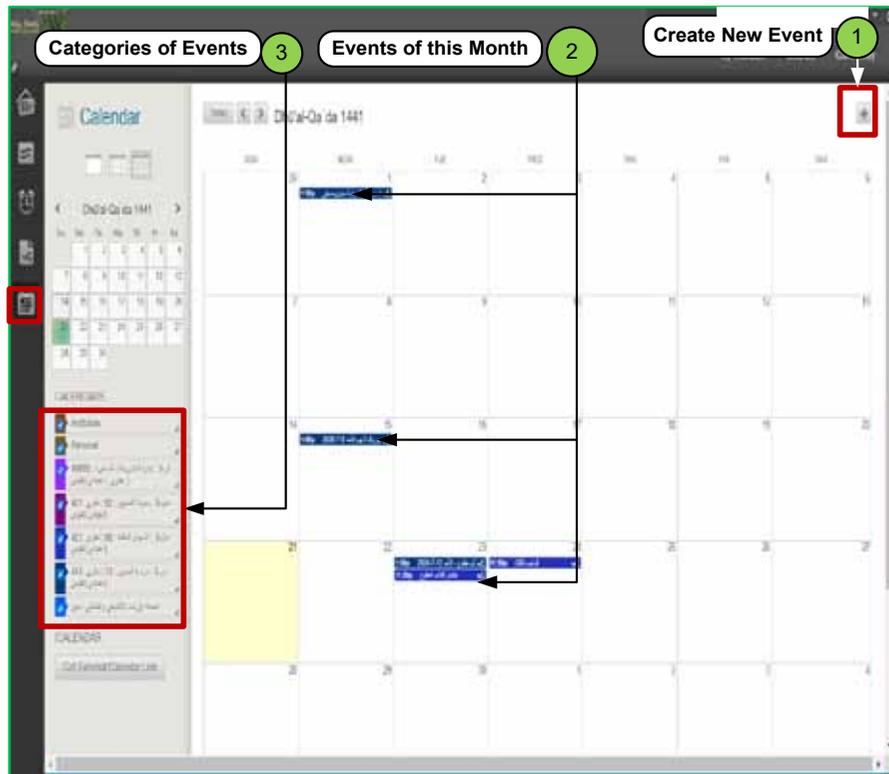


Figure 13-9  
Calendar's  
Screen

**To browse and see the details of any event, follow these steps:**

- Click on the event box to display a small window containing the details, where the details can be, for example, related to testing date or other.
- You can go directly to what the event indicates, for example, the test by clicking on the link to the test to go directly to the required window.

**To create a new event, follow these steps:**

- Click the (+) icon in the top right of the screen
- In the "Creat Event" window we write the name of the event
- Determine the duration of the event by specifying the day and the hour, or making it continuous throughout the day
- Type 'Event Description' at the appropriate location
- Click "Save" as shown in Figure 13 -10.

The screenshot shows a 'Create Event' dialog box with the following elements:

- Event Name:** A text input field labeled 'Event Name' with a circled '1' next to it.
- Calendar:** A section containing 'Start Date' (2) and 'End Date' (3) fields.
- Starts:** A date and time field showing '11/21/1441 03:30 PM'.
- Ends:** A date and time field showing '11/21/1441 04:00 PM'.
- Options:** Two checkboxes labeled 'All Day' and 'Repeat'.
- Event Description:** A large text area labeled 'Event Description' with a circled '4' next to it.
- Buttons:** A 'Save the Event' button (5) and a 'Save' button (highlighted with a red box) at the bottom right.

**Figure 13-10**  
Create a  
New Event

**6. Courses:** It contains the names of the recently visited courses arranged from the latest to the oldest, in addition to the Settings button and the Help button.

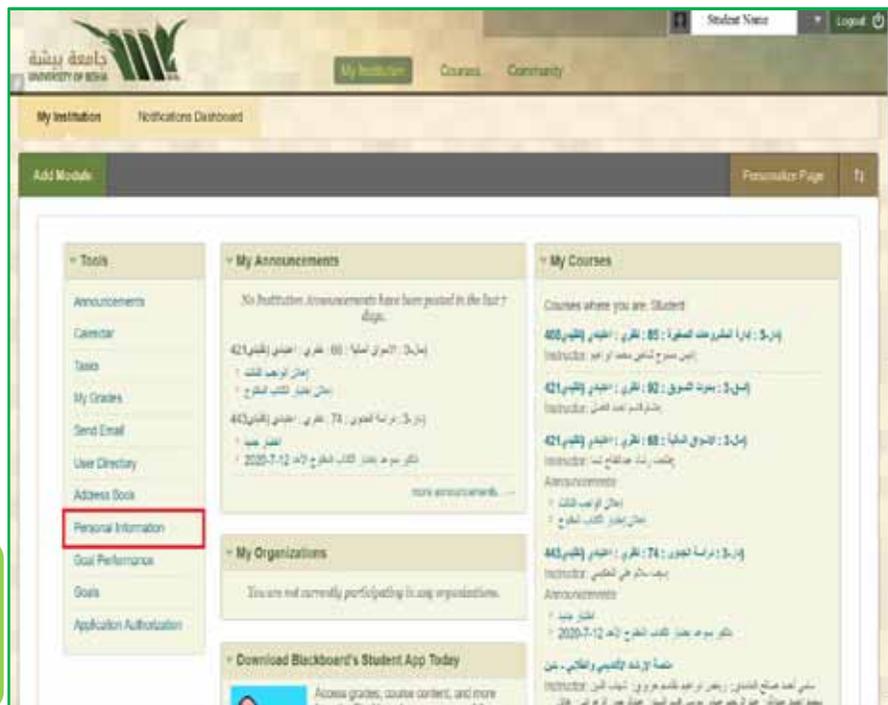
### 135- Change the settings and the main language of the Blackboard system

**Skill 13- 8**  
Changing the Interface Language of the Blackboard System



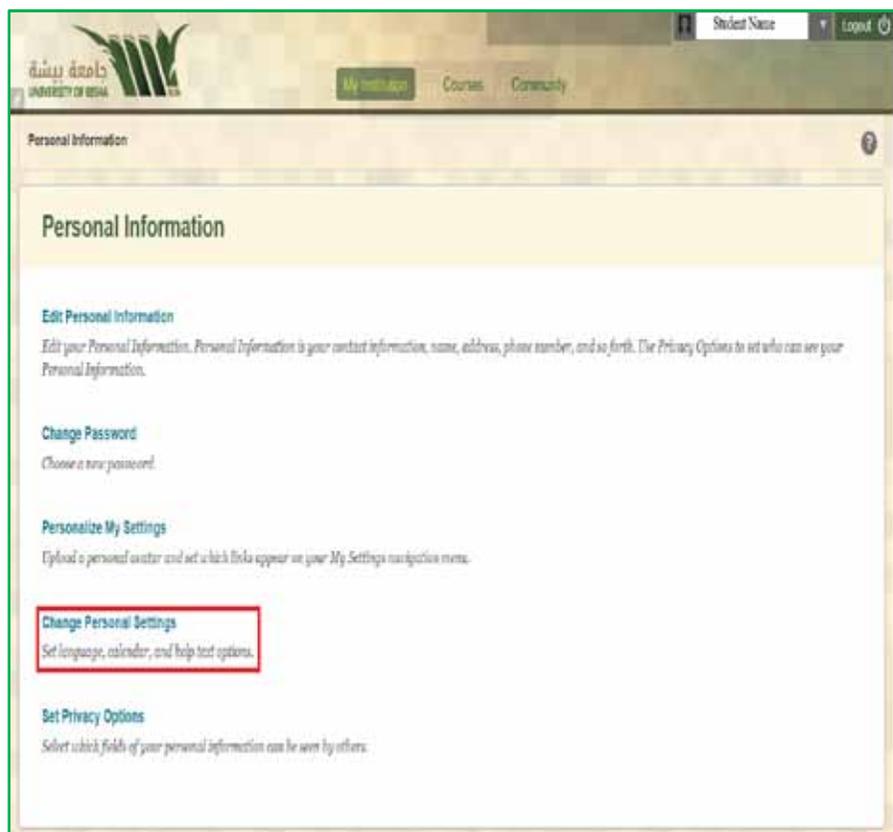
The e-learning system “Blackboard” allows you to change the display settings such as the language (Arabic or English), the type of calendar (Hijri or Gregorian) and the day of the beginning of the week, and you can choose by following the following steps:

- From the home page of the system choose "Personal Information" as shown in Figure 13 -11.



**Figure 13-11**  
Access  
Personal  
Information  
Screen

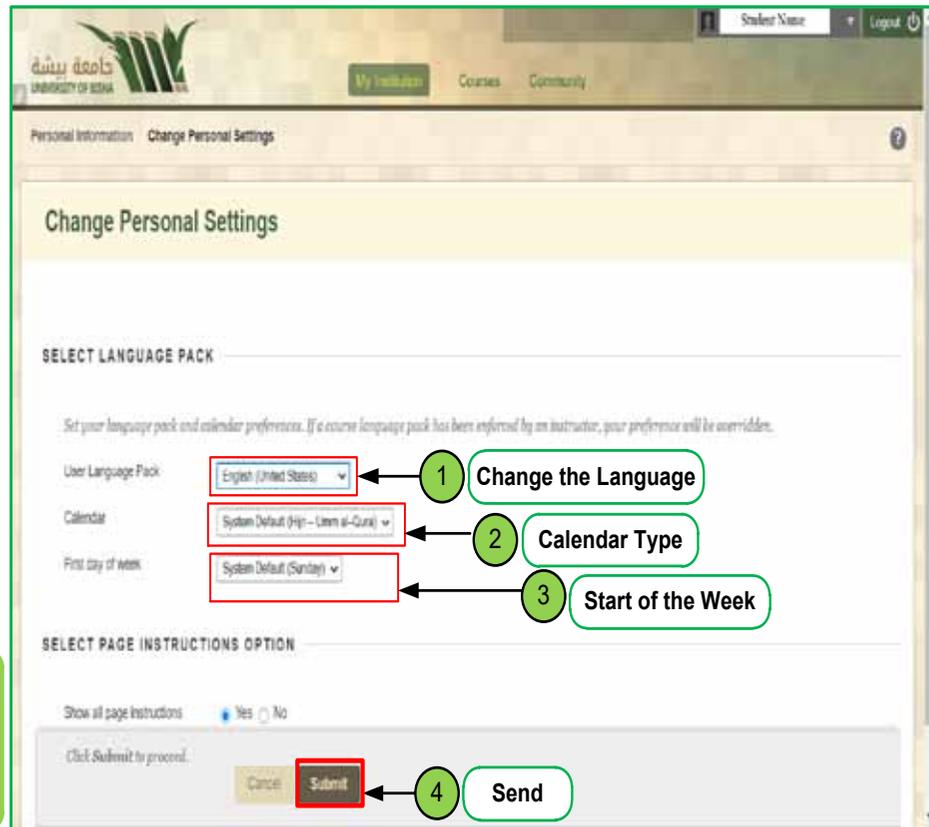
- Click on the “Change Personal Settings” button as shown in Figure 13 -12.



**Figure 13-12**  
Changing  
Personal  
Settings

- From the “Select a Language Pack” menu, choose the required language (Arabic or English) and from the Calendar list choose the required calendar type (Hijri

or Gregorian) then click “Submit” as in Figure 13- 13.



**Figure 13-13**  
Change  
Blackboard  
Personal  
Settings

To edit some personal information such as first name, middle name, lastname and used email, follow these steps:

### Skill 13 - 9

#### Edit Personal Information in the Blackboard



- From the home page of the system, choose "Personal Information" as shown in Figure 13- 11.
- Choose "Edit Personal Information".
- A window will appear to us through which you can update the information that can be changed, such as title, first name, middle name, last name, and email used, as in Figure 13 -14.

**Edit Personal Information**

\* Indicates a required field.

**PERSONAL INFORMATION**

Title

\* First Name

Middle Name

\* Last Name

Suffix

Other Name

Email

Student ID

**ACCOUNT INFORMATION**

\* Username

Click **Submit** to proceed.

Cancel Submit

Figure 13-14  
Personal  
Information  
Editing  
Screen

- After completing the update, click "Submit" to save the updates.
- A window will appear that confirms that your data has been successfully updated as shown in Figure 1315-.

UNIVERSITY OF BAHAMAS

My Institution Courses Community

Student Name Logout

Personal Information

Success: User St. ID edited

**Personal Information**

[Edit Personal Information](#)  
Edit your Personal Information. Personal Information is your contact information, name, address, phone number, and so forth. Use Privacy Options to set who can see your Personal Information.

[Change Password](#)  
Choose a new password.

[Personalize My Settings](#)  
Upload a personal avatar and set which links appear on your My Settings navigation menu.

[Change Personal Settings](#)  
Set language, calendar, and help text options.

[Set Privacy Options](#)  
Select which fields of your personal information can be seen by others.

Figure 13-15  
Success of  
Editing  
Personal  
Information

## Skill 13 - 10 Recognizing the Modules, Add and Delete Modules

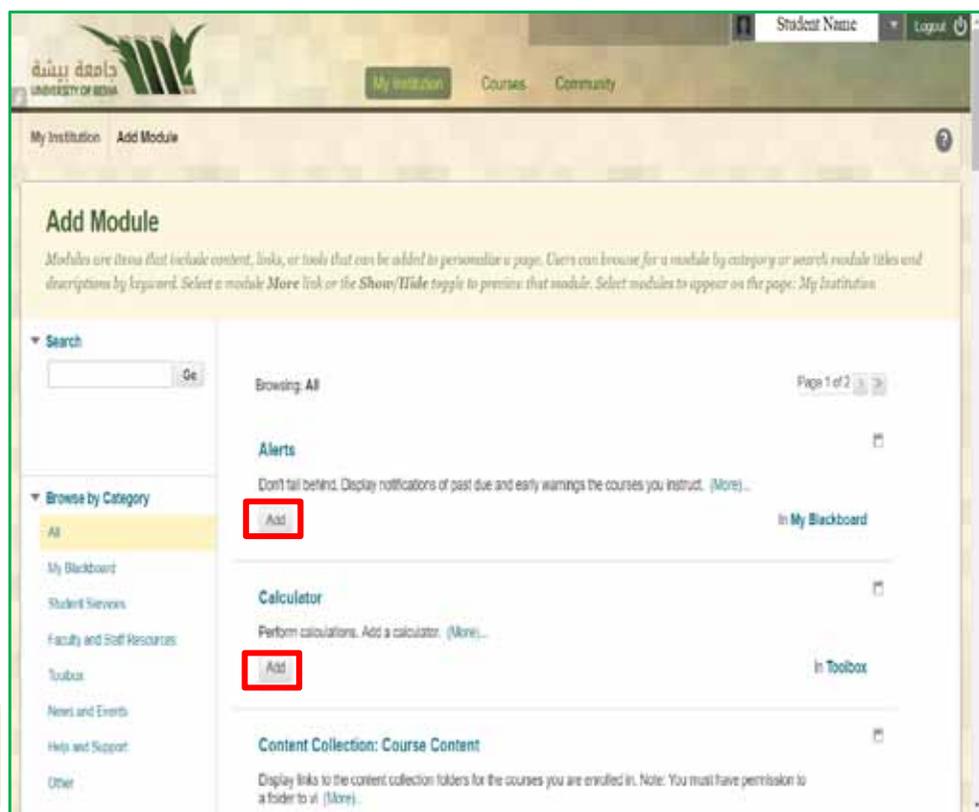


### 13-6 Modules

**Modules:** They are a group of objects that appear inside the home page and each module includes specific content within the page such as “announcements”, or links such as course links in “my courses”, or tools that can be added to customize the user’s page such as “calculators”.

#### *To add a module to the home page*

- Click the left mouse button on “**Add Module**” located in the top left of the page.
- View the available units and choose the unit to be displayed by clicking on the “**Add**” button, located directly below the unit as shown in Figure 13 -16.
- The added unit will appear on the home page, for example adding the **Calculator**, as in Figure 13 -17.



**Figure 13-16**  
Adding a  
Module

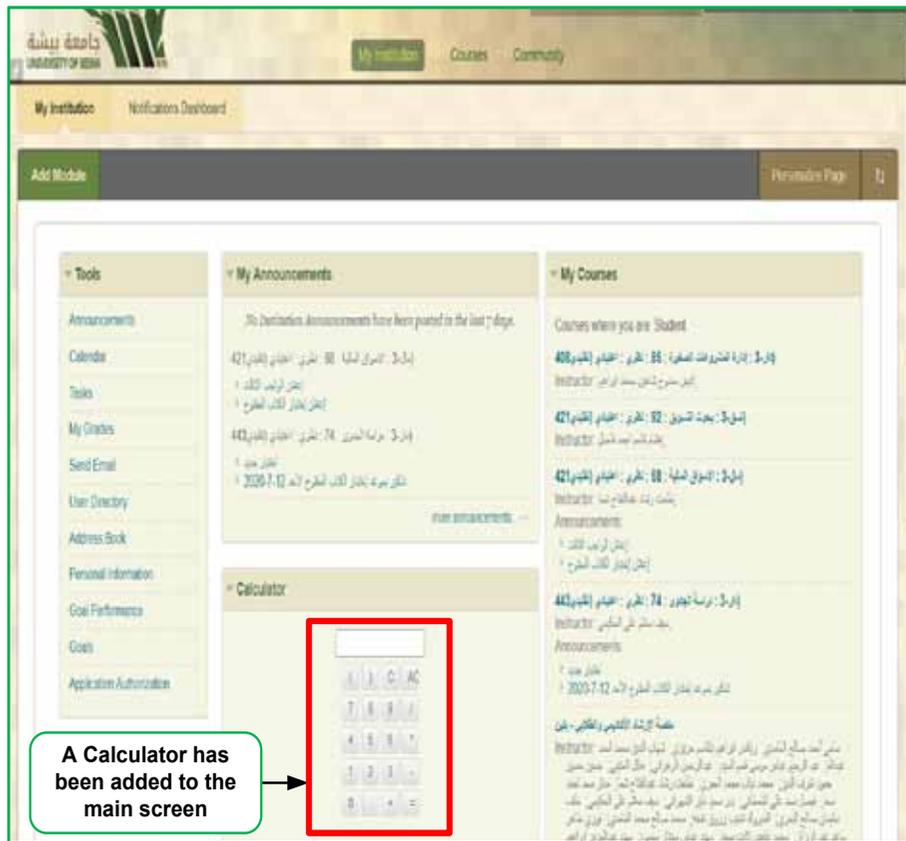


Figure 13-17  
Adding a  
Calculator

- To remove a module from the home page, we follow the same previous steps, but we click on the “Remove” button that is located below the module to be removed directly as in Figure 13 -18.

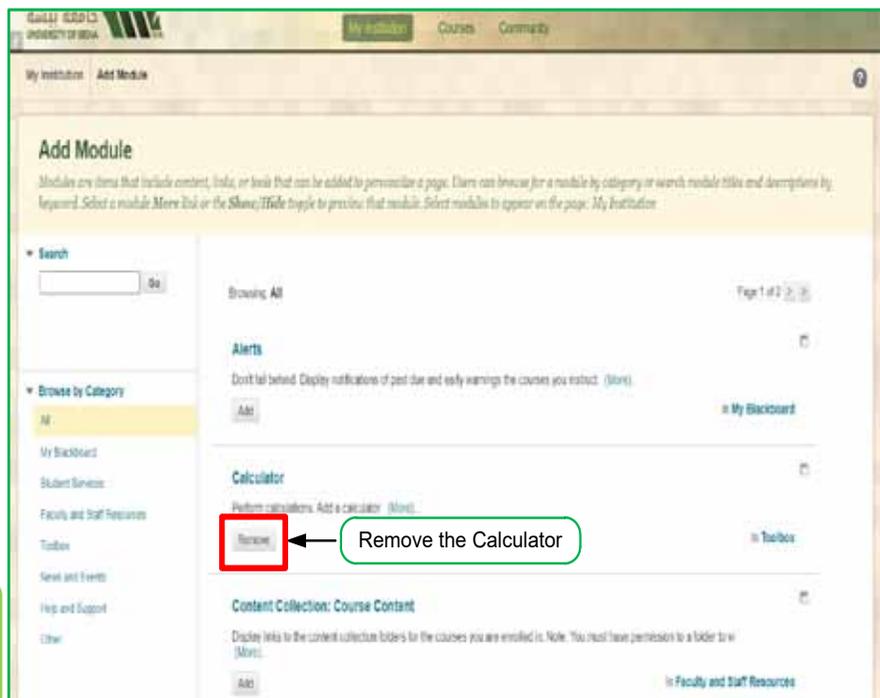


Figure 13-18  
Removing  
the  
Calculator

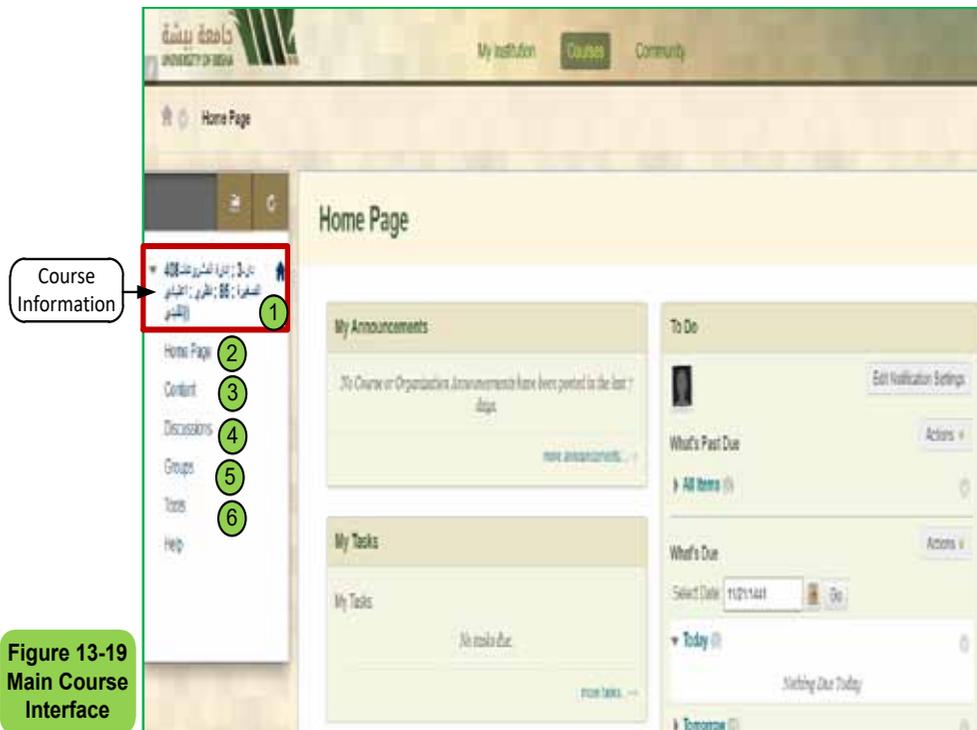
## Skill 13- 11

### Recognizing the Course Home Page in the Blackboard System



#### 13 -7 Course Home Page

The course home page can be viewed, as it contains the following elements, as shown in Figure 13 -19.



**Figure 13-19**  
Main Course Interface

- 1. Course Information:** This page contains the course name, code, number, and type of section (theoretical or practical).
- 2. Home Page:** This page displays the home page of course through which you can browse the course contents.
- 3. Content:** This page displays information about the course and is created by the instructor. It can contain course lectures, as well as attached files of text files, presentations, videos ... etc. You can open and download the existing files by clicking on the file link as shown in Figure 13- 20.

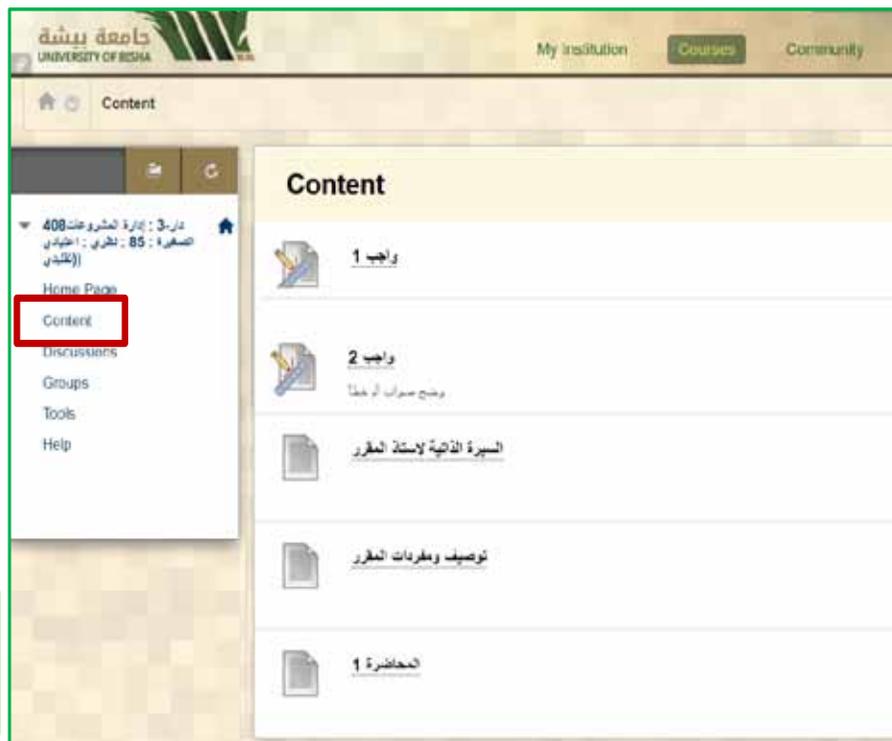


Figure 13-20  
Course  
Content  
Screen

4. **Assignments and Tests:** The faculty member creates them and can contain assignments and electronic tests, and they will be detailed later.
5. **Discussion:** This page displays a list of forums and course discussions as shown in Figure (13 -21).

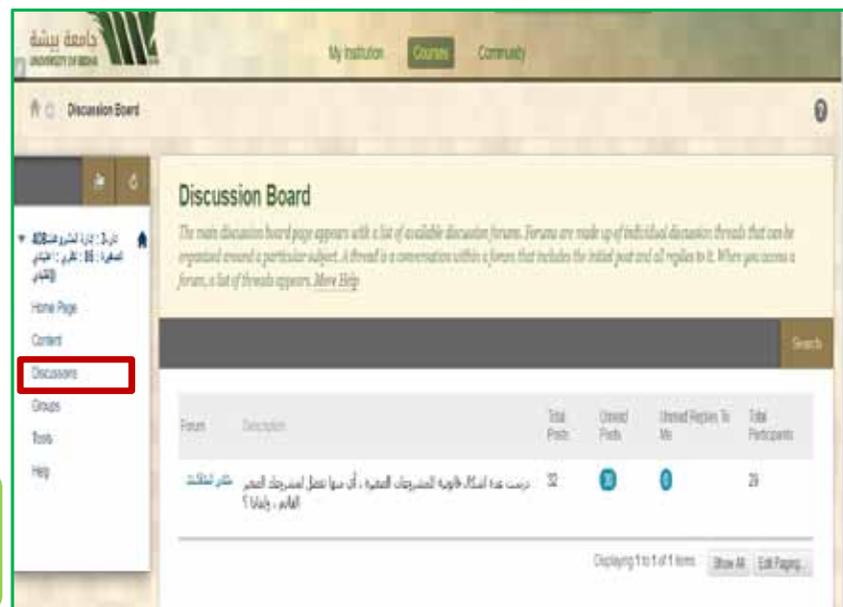


Figure 13-21  
Discussion  
Board  
Screen

6. **Tools:** This page contains additional tools that the student can use, such as Blogs and Blackboard Collaborate Ultra, as well as through which you send and receive messages in the course by following the following steps:

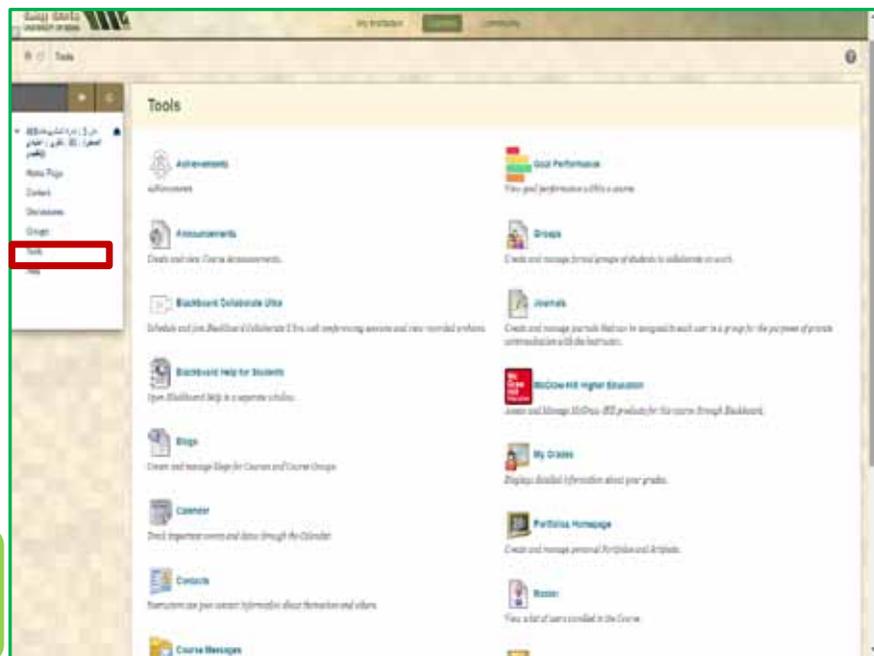
## Skill 13- 12

### Reviewing and Sending Messages to the Course Members



#### *To display and read messages from the course members:*

- Click on "Course Messages" as in Figure 13 -22
- Choose "Inbox" to view the received email from a course member (course students or instructor)



**Figure 13-22**  
Tools Screen

#### *To send a new message:*

- Choose "CreateMessage"
- Select recipients from the course members.
- Type the subject of the message and the message with the required formatting using the formatting bar
- Click "Submit"

## Skill 13 - 13

### Submitting and Downloading Assignments



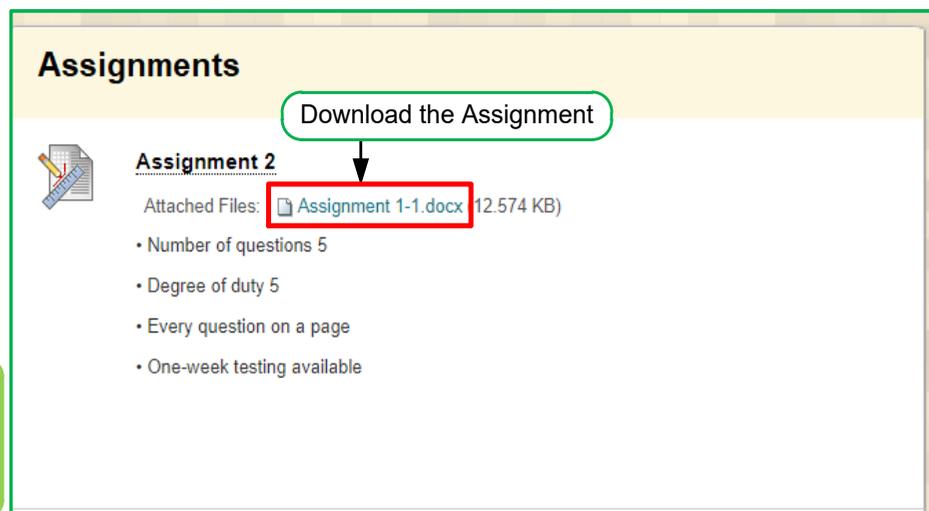
### 13 -8 Assignments

Assignments are considered one of the most important means in evaluating students, especially in electronic courses that are taught remotely. The instructor

creates the assignment and determines his grades and the number of trials for answering is permitted, and then he uploads it to students on the “blackboard”. The instructor controls the date the assignments are made available. It is advised before starting on the submission process of assignment to read the instructions for the assignment, if any, that provided by the instructor.

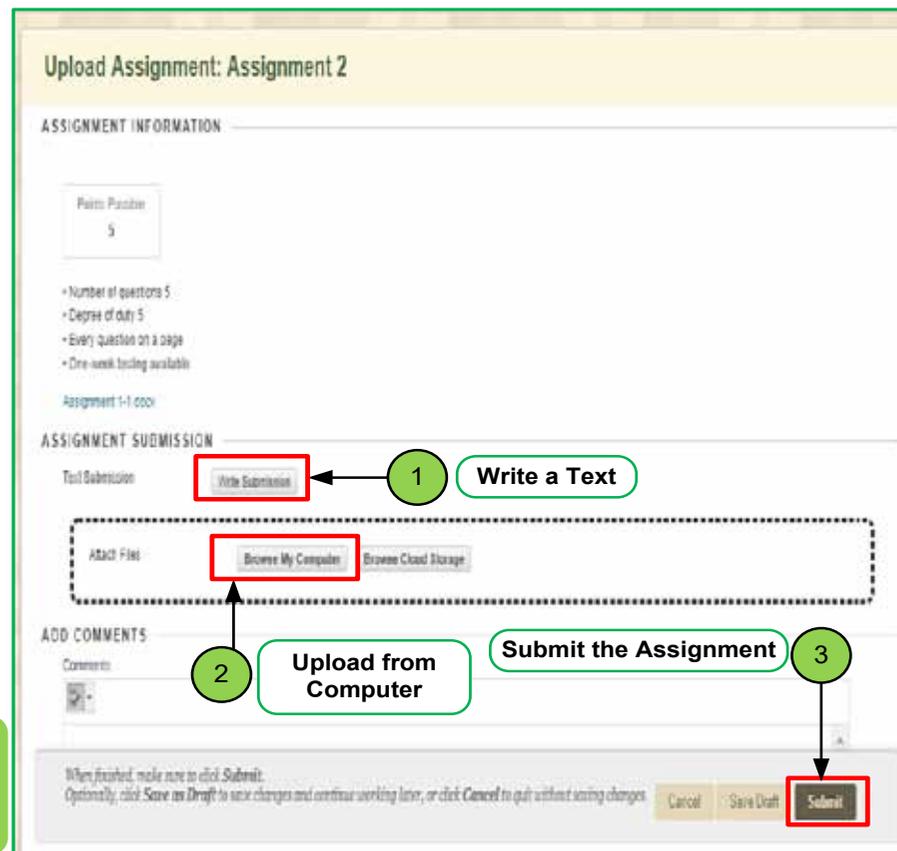
**How to download assignment:**

- Go to the course you want to do its assignment.
- Choose the assignment area from the course list that specified by the instructor (varies from one course to another depending on how the instructor has added it)
- Click on the name of the assignment to be resolved from the list of assignments as in Figure 13 -23.



**Figure 13-23  
Selecting an  
Assignment**

- Click on the assignment file link and choose "Save As" to download the assignment on your device
- Solve the assignment and follow the attached instructions, if any, that explain how to solve the assignment and how to upload it
- How to submit an assignment?
- Go to the course you want to submit the assignment with.
- Click on the name of the assignment to be submitted from the list of assignments, and then a window for submitting the assignment will appear to you as in Figure 13 -24.



**Figure 13-24**  
**Assignment**  
**Submission**

- Choose how to submit the assignment from one of the two available options, writing the answer through the **"Write a Submit"** button to write the answer text-only, or click on the **"Browse My Computer"** button to attach the answer file from your computer.
- In the **"Comments"** box, write any comments that you would like to send to the course professor.
- Click **"Submit"**.
- The Submission Record Review window appears to confirm the success of the submission process as in Figure 13 -25.
- The instructor can allow you to submit the assignment a certain number of times, and you can do so through the "start over" button as in Figure 13- 25.

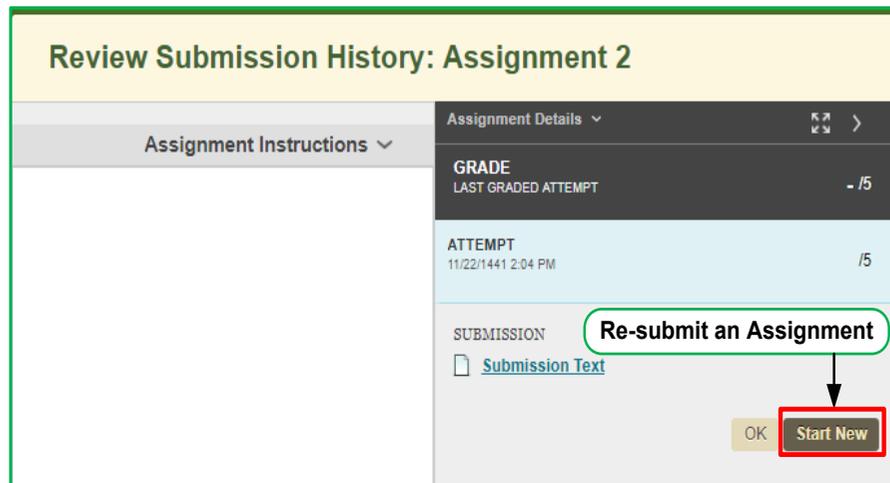


Figure 13-25  
Assignment  
Review and  
Resubmission  
Screen

### Skill 13 - 14 Displaying and Taking Electronic Tests

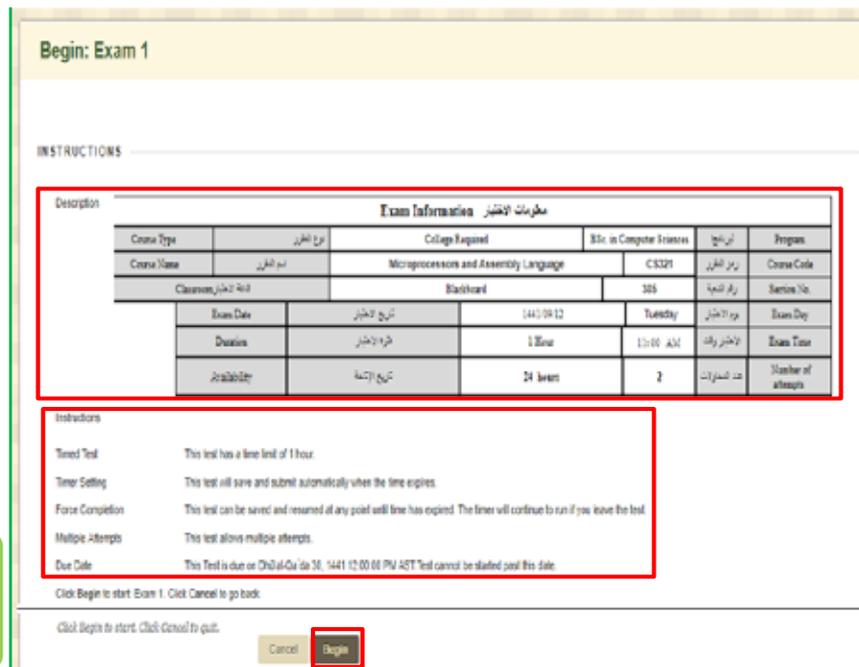


#### 13 -9 Electronic Tests

Electronic tests have an important role in evaluating the extent to which students can understand the course. The course professor can perform a set of electronic tests throughout the semester to measure the progress of students. Where he asks a set of questions and specifies a particular timing for the answer and number of the attempts to answer, as well as determine the method for calculating the degree (the degree of another attempted - average degrees of attempts or the highest degree).

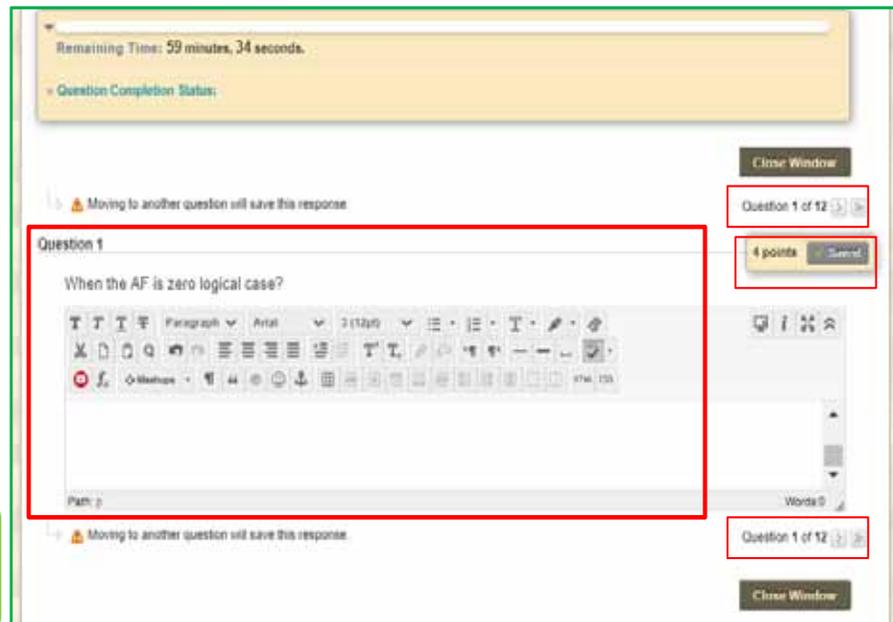
##### *How to take the electronic test?*

- Go to the course for which you want to take the exam
- Choose the test to be solved from the course list (in most cases, the instructor will place a test announcement on the course home page)
- Read the test instructions as shown in Figure 1326- and press the start button



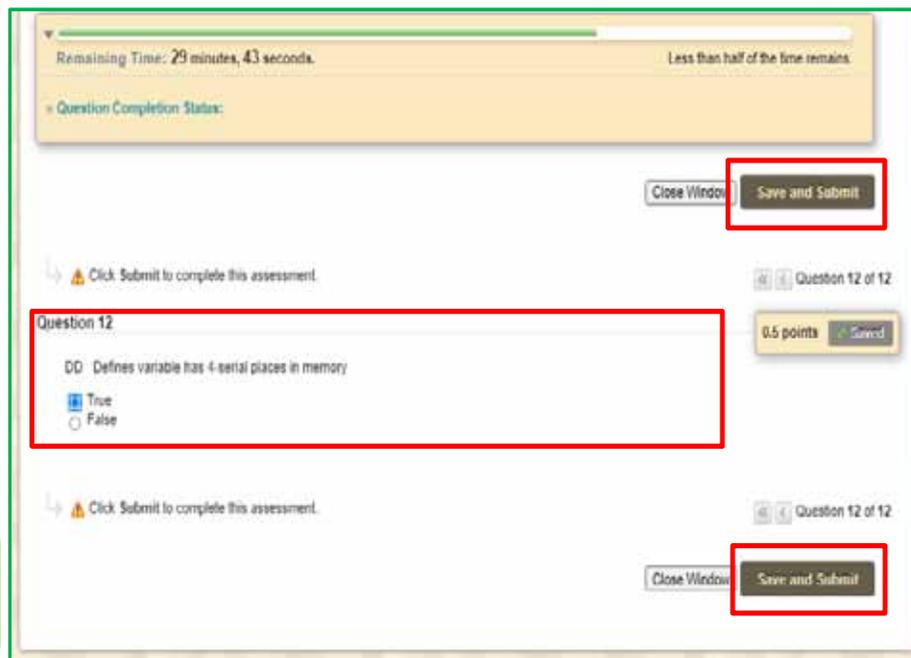
**Figure 13-26**  
Electronic  
Tests  
Guidelines

- Read the test instructions to know the number of attempts and how the grade is calculated and then start to solve the test questions as in Figure 13- 27.



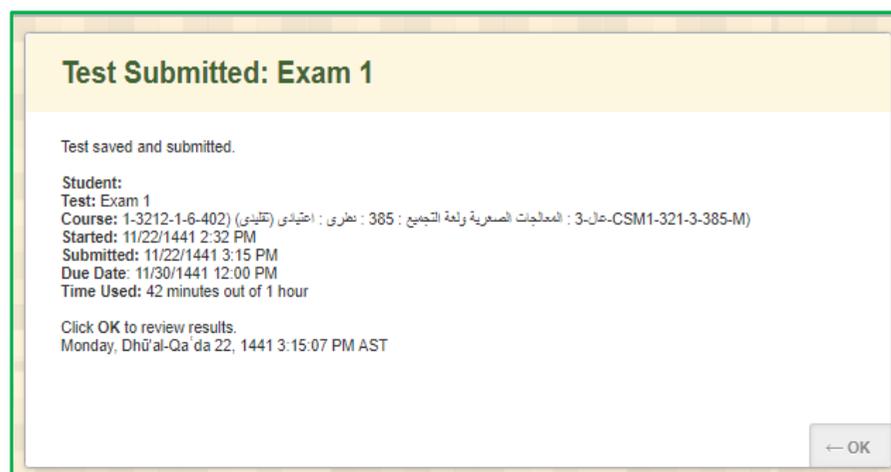
**Figure 13-27**  
Begin the  
Test

- Click on the "Save and Send" button after completing the answer to the last question, as in Figure 13 -28.



**Figure 13-28**  
Finalize the  
Test

- The Submission alert window will appear to show you the success of the test performance and the degree obtained in each question as in Figure 13- 29.



**Figure 13-29**  
Review the  
Test

### Skill 13- 15

Recognizing the Virtual Classrooms and How to Work with Them



### 13 -10 Virtual Classrooms

Virtual Classrooms are a virtual environment developed for online learning, and its goal is to facilitate the educational process by allowing students and instructor to participate and control the learning communities by using personal computers and smart devices. The “Blackboard” system provides a set of tools that make the virtual classrooms a flexible environment for practicing e-learning

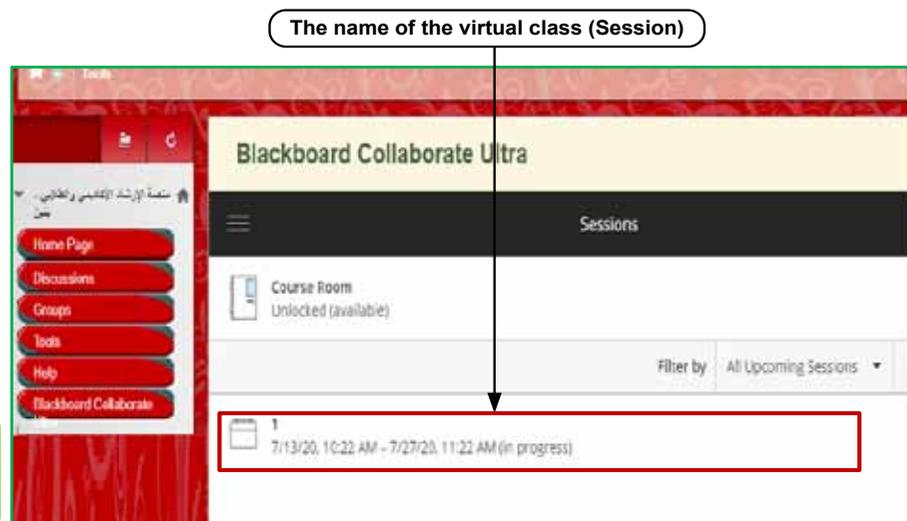
*To enter the virtual classrooms on the “Blackboard” system, follow these steps:*

- Choose the tools from the course list, then click Collaborate



**Figure 13-30**  
Entry into  
Virtual  
Classes

- Choose the required session to join from the list of the available sessions (if available) by clicking on the session name as in Figure 13- 31.



**Figure 13-31**  
Open the  
Session

- If this is the first time to join the blackboard collaborate on the computer, then the “Launcher” program should be downloaded as in the following figure to download, click on the "Download Launcher" button and follow the download steps as shown in Figure 13 -32.



Figure 13-32  
Download  
Launcher

- A window will appear containing the details of the sessions, such as the session name, start and end date, to join the virtual classroom click on the "Join Course Room" button as shown in Figure 13- 33.

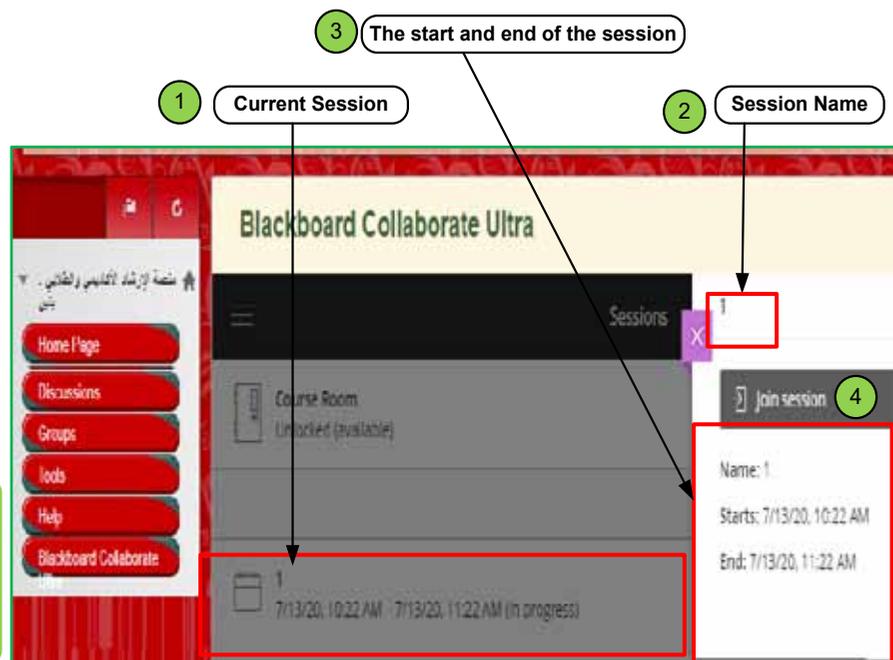
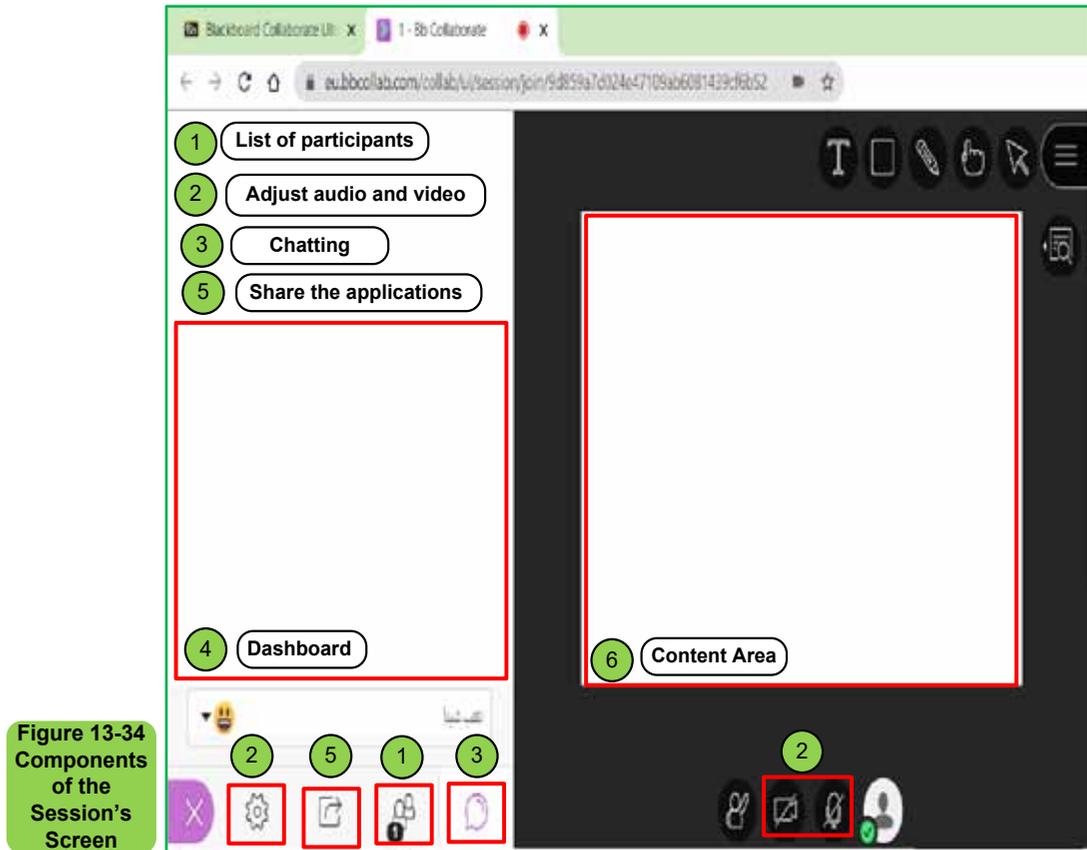


Figure 13-33  
The  
Session  
Details

- Allow Java to operate by clicking the "Run" icon from the window that will appear.
- The virtual classroom window will appear as in Figure 13 -34 with noting that

the language used in the virtual classroom is the same as the language of the computer used. To change the language of the virtual classroom, the language of the used device must be changed.



From Figure 13 -34, we find that the main components of the home page of the virtual classrooms:

1. **List of Participants:** The list of participants displays all the people who are currently in the virtual classroom, and the participant can control the status (active or inactive) and also can use the hand-raising icon in case of a question.
2. **Audio and video tuning window:** This window is used to control and adjust the audio and video in sound way, whether headphones or microphone, as well as adjust the camera to shoot video in case of need.
3. **Conversation window (chatting):** Through this window, the participant can exchange messages with the rest of the participants in the virtual classroom, whether he is the course professor or students.
4. **Dashboard:**It contains the most important information of the session.
5. **Sharing applications:** Through this button, the course instructor can share

different applications with students in the virtual session.

6. **The content area:** it is the area in which the interaction, explanation, and comments will be made by the course professor.

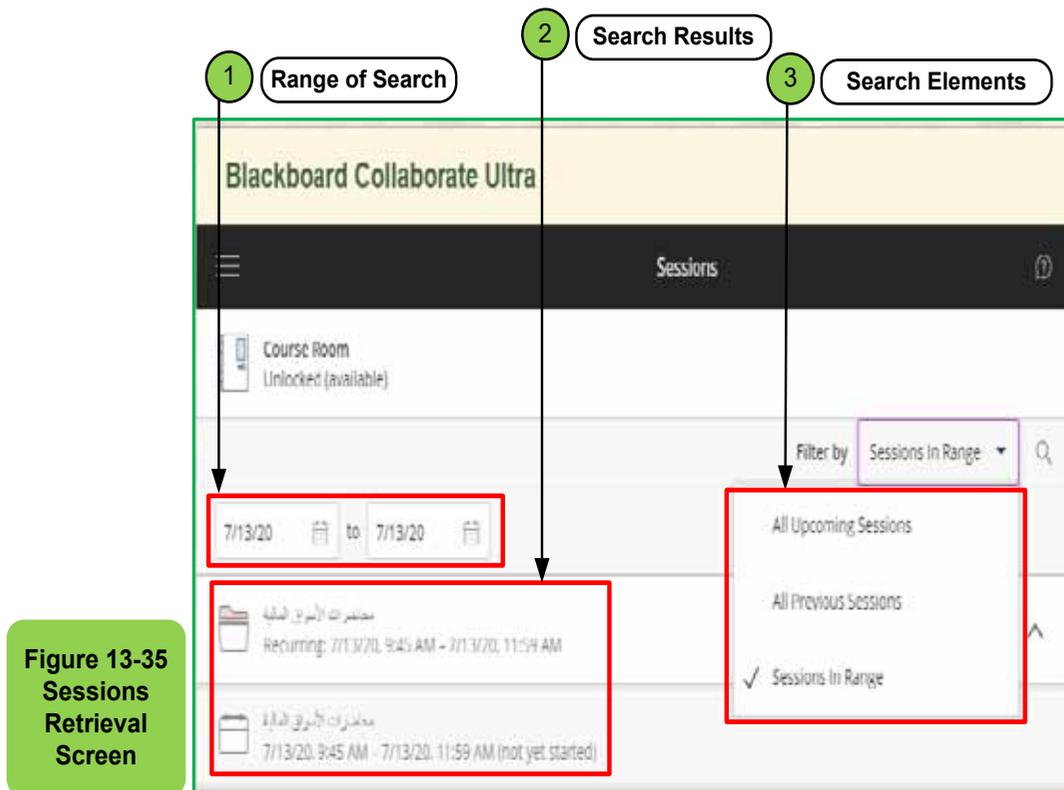
### Skill 13 - 16 Recording and Saving the Sessions



#### 13 -11 Recordings and Savings the Sessions

The instructor can save the virtual sessions when they are finished so students can reach them at any time by following the following steps

- From the “Blackboard Collaborate” page, click on the “Recordings” button as in Figure 13 -35.
- Choose the session to play from the list of saved sessions (if any)

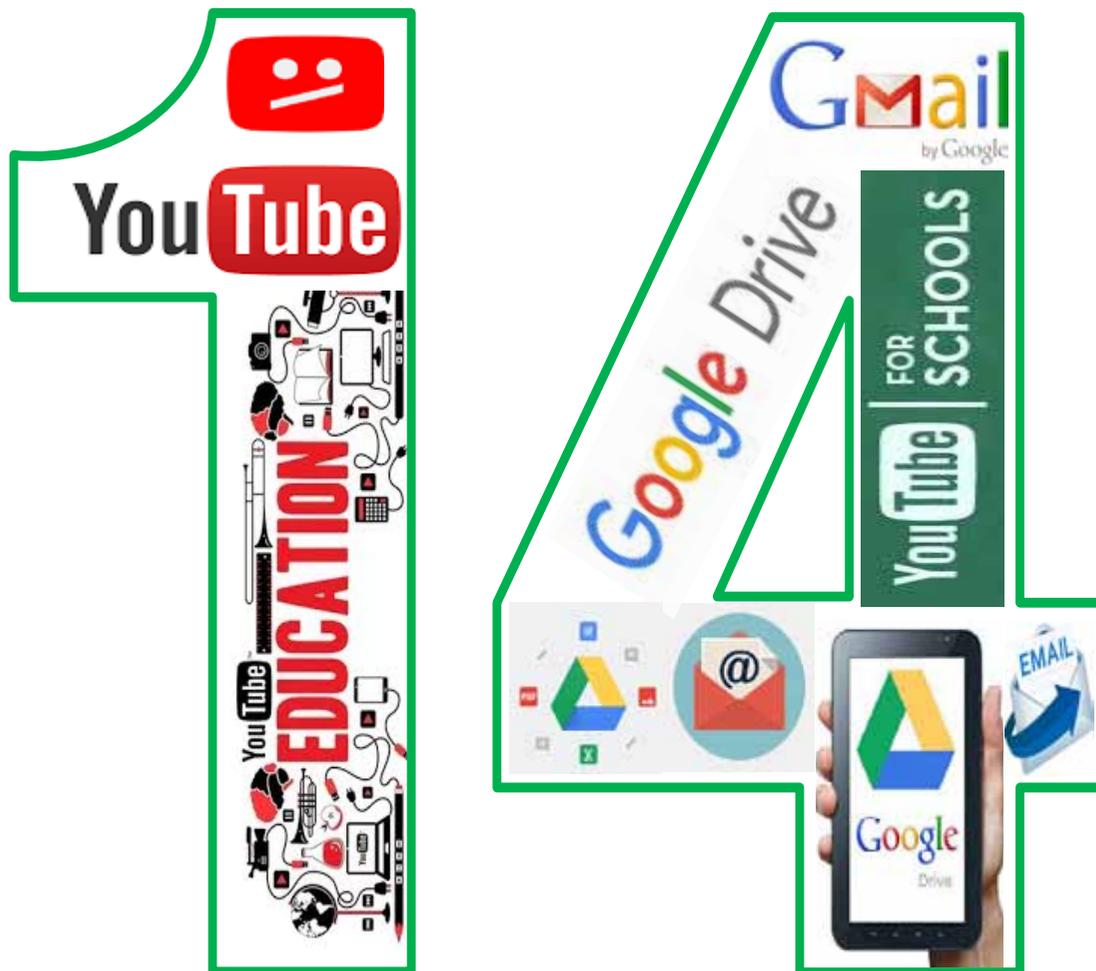


**Figure 13-35**  
Sessions  
Retrieval  
Screen



# Chapter 14

## Electronics Communication Methods







## *Electronics Communication Methods*

### Objectives

**➔ Main objectives:**

1.

**➔ Sub-Objectives**

It is expected from the student after studying this chapter, to master the following knowledge and skills: Recognize the operating systems and their main functions and types.

## 14- 1 Introduction to Electronics communication

### Skill 14 - 1

Learn about the most important methods of electronics communication and its features.



Definition: Electronics communication media are a group of modern technical applications that rely on the Internet to support communication and interaction through audio messages, text messages, and video messages that work these means to build and activate living communities around the world, and electronic media has become a major influence in the educational fields. The most famous of which is e-mail, Google Drive and YouTube because of their great role in increasing interaction within the educational institution in order to integrate students into effective activities, and to start to other uses more useful and effective. Based on this principle, Bisha University has been keen to provide its students with a range of social networking services, the most famous of which is the university e-mail service in order to increase the interaction between the university staff in order to improve the educational process.

### Skill 14 - 2

Access to the Student's University E-mail.



## 14 -2 Access University E-mail

An e-mail account is created for all university students and is linked to the university's network (ub.edu.sa). The form of this e-mail is as follows:

Student\_Id@ub.edu.sa

The password is the national id number. University e-mail is an account provided by Google via Gmail and the email service of internet giant Google.

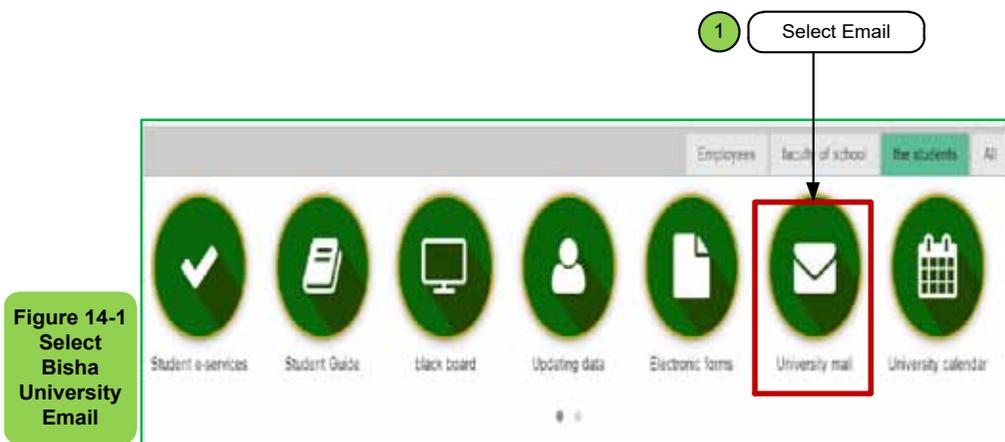
Gmail is an abbreviation for Google Mail. Here are the most important features of this email:

1. **Storage:** Gmail provides 15GB of storage for new accounts, which is constantly increasing.
2. **Protection:** Gmail accounts are highly secure, making their hacking difficult.
3. **Interface:** Gmail has a simple and wonderfully organized user interface.
4. **Supports most languages:** Gmail supports the ability to write in more than 40 languages, one of which, of course, Arabic language.

5. Convert Conversations into Video: Gmail allow to Convert Text Conversations into Video Calls using Hangouts.
6. Google Drive: Gmail supports saving message attachments in Google Drive, accessible from anywhere in the world.

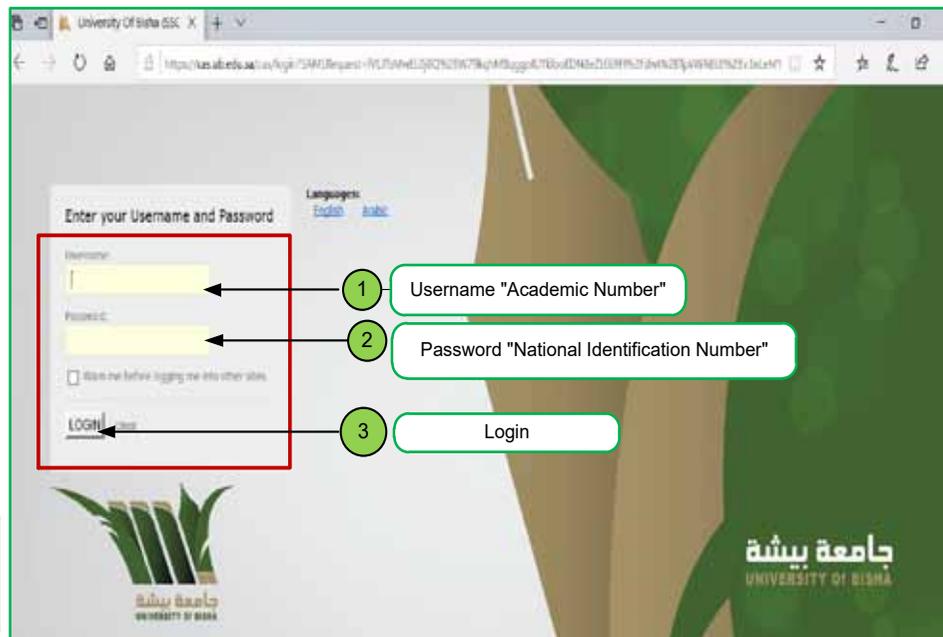
**To access the University's e-mail service through the university's website, follow the following steps:**

- Write the university's website address (www.ub.edu.sa) in the internet browser area, and then press the Enter key from the keyboard.
- Click the left mouse button on the «Students» icon on the page and then choose the university e-mail as in Figure 14- 1.



**Figure 14-1**  
Select  
Bisha  
University  
Email

- The login screen appears as in Figure 14- 2



**Figure 14-2**  
Login to  
Email

- The university e-mail page will appear to the user, through which e-mails and electronic files can be sent and received as in Figure 14- 3.

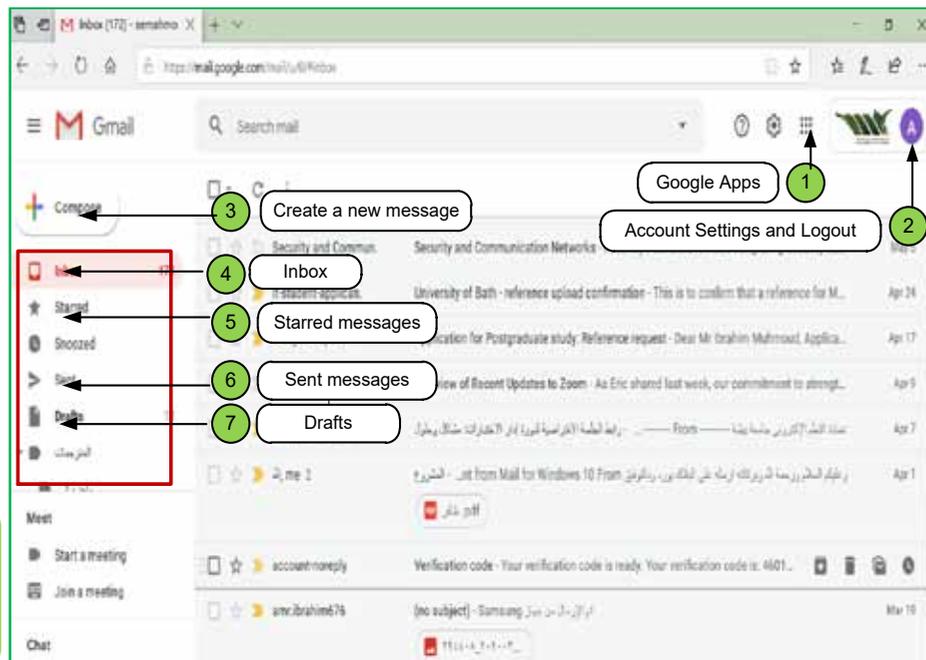


Figure 14-3  
Email Page

## Skill 14 - 3

### Create a New E-mail Message

#### 14- 3 Creates a New E-mail Message

*To create and send a new email message, follow the next steps*

- Click the left mouse button on the «Create» icon on the home page showing a new message creation window that contains options to create a new message as in sections 1 to 10 in Figure 14- 4.

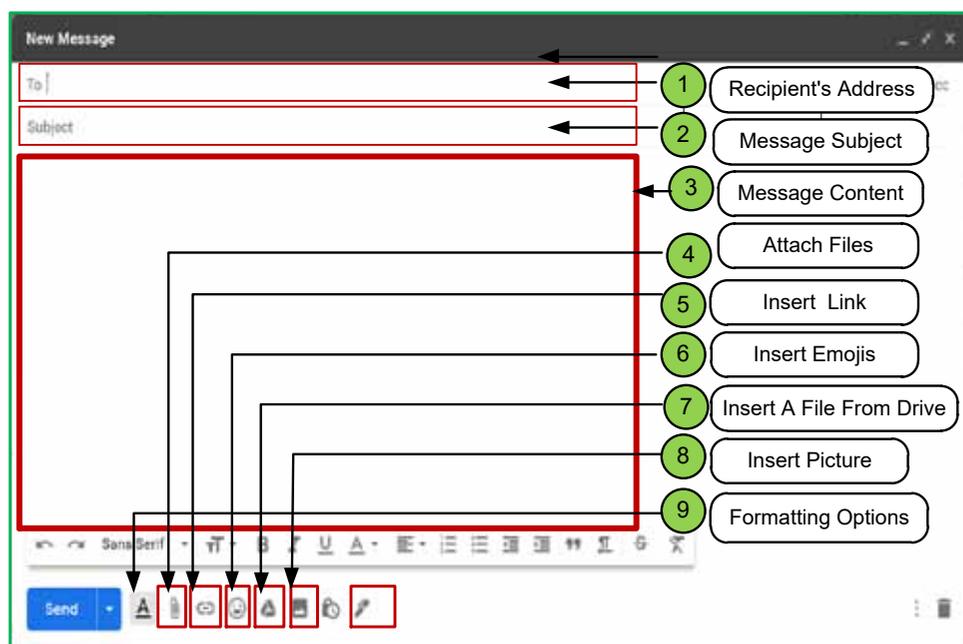


Figure 14-4  
Create a  
New Email

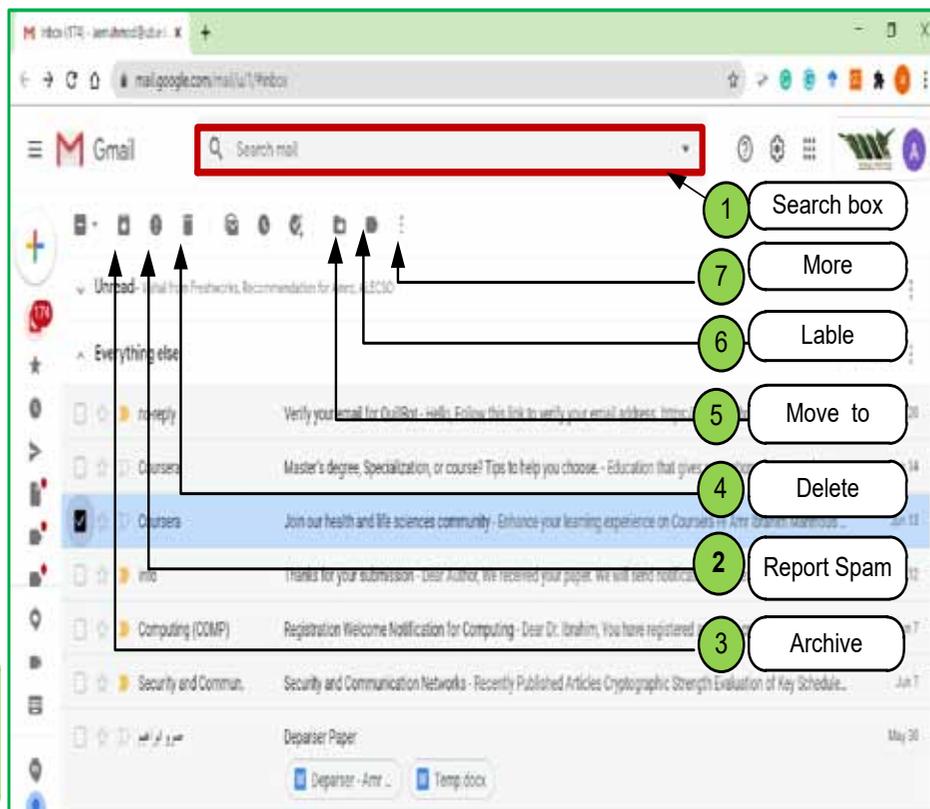
- Type the recipient's email address in the recipient's address with the word 'To', then write the subject of the message in 'Subject' and then write the message contain in the designated area.
- You can use the tools at the bottom of the window to insert emoji, links, or image.
- After you have finished writing the desired message click on the 'Send' button

**Skill 14 - 4**  
Delete, Move and Archive E-mails.



**14- 4 Working with E-mails Messages**

E-mail messages can be handled by performing many processes such as deleting the message or moving the message to a folder or distinguishing by star and to do so you must first select the message to be dealt with by clicking on the small box on the right of the message and then the required process can be chosen as in Figure 14- 5.



**Figure 14-5**  
Dealing  
with Gmail

There are several of processes that can be performed on messages and contacts that are summarized as follows:

A- To search for a specific message or messages, you can use the search box at the top of the email home page, write some words that indicate the message or messages you want to search for, or you can use advanced search options in the search process by clicking on the small arrow on the left of the search box to show the advanced search screen as in Figure 14 -6.

### Skill 14 - 5 Search for €-mail Messages

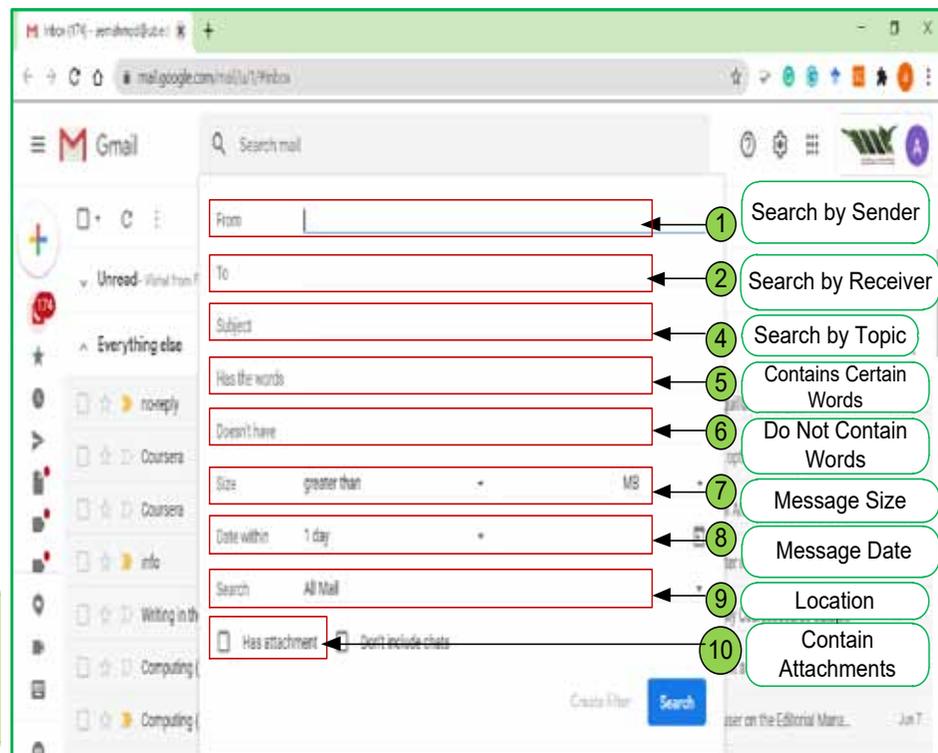


Figure 14-6  
Advanced  
Search for a  
Message

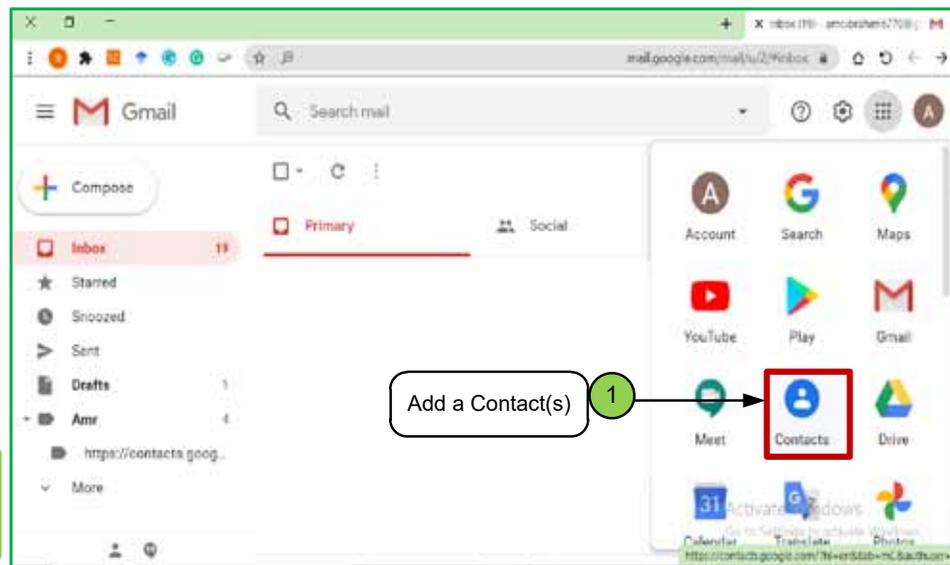
### Skill 14 - 6 Add a New Contact for €-mail.



A. Add a new contact: You can use the 'Mail' button at the top right of the email home page

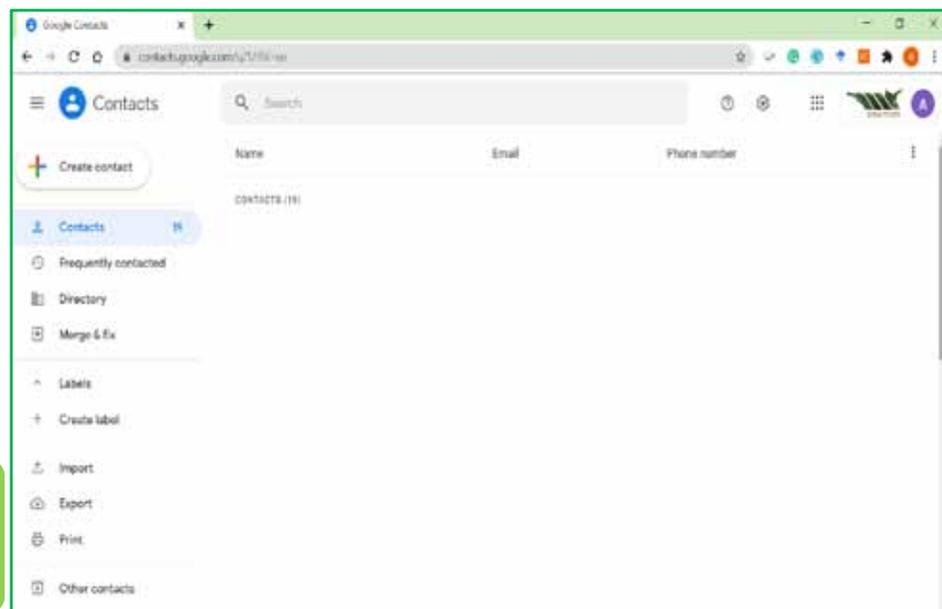
**To do this, follow the following steps:**

- Click on the small arrow to the left of the mail button as in Figure 14- 7.
- Click on <Contacts> and then on the add a contact button as in Figure 14- 8



**Figure 14-7**  
Add a  
Contact(s)

- Enter new contact data as in Figure 14.8 .

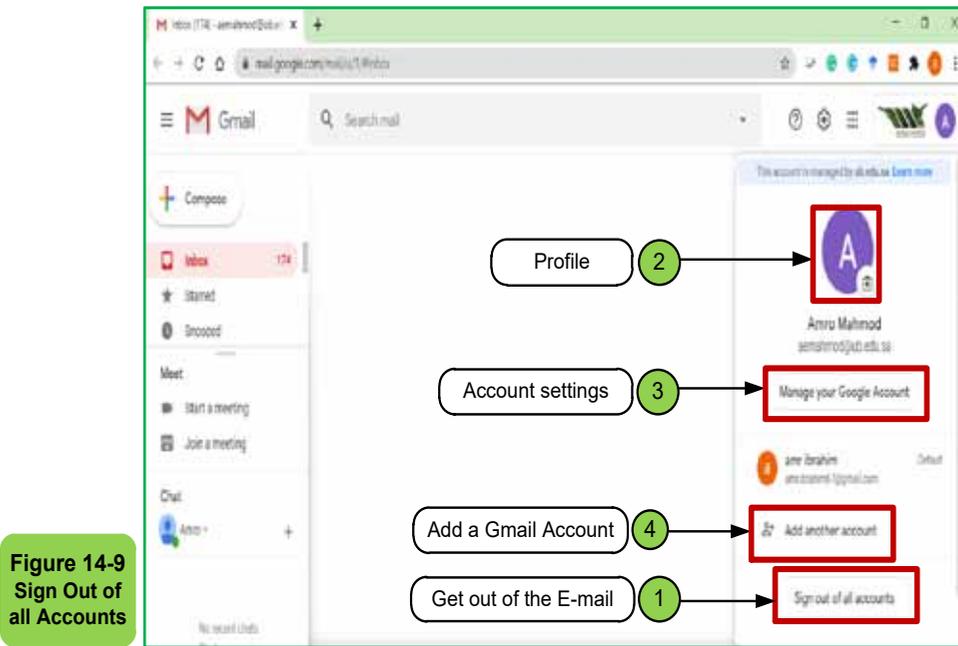


**Figure 14-8**  
Enter a New  
Contact Data

**Skill 14 - 7**  
Sign out from E-mail correctly.



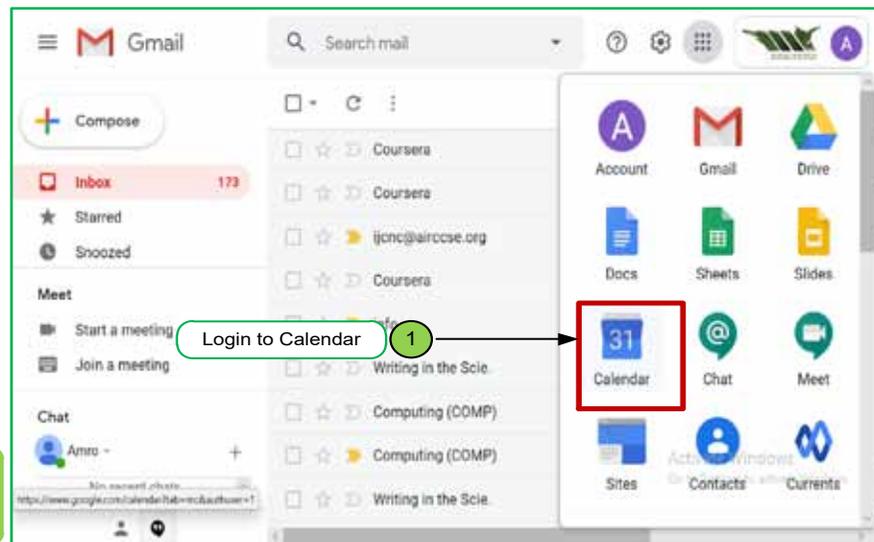
A- Sign out: To record the process of sign out the email, click the left mouse button on the mail address (or mail image) at the top left of the page, and then click 'Exit' as 14 -9.



**Figure 14-9**  
Sign Out of  
all Accounts

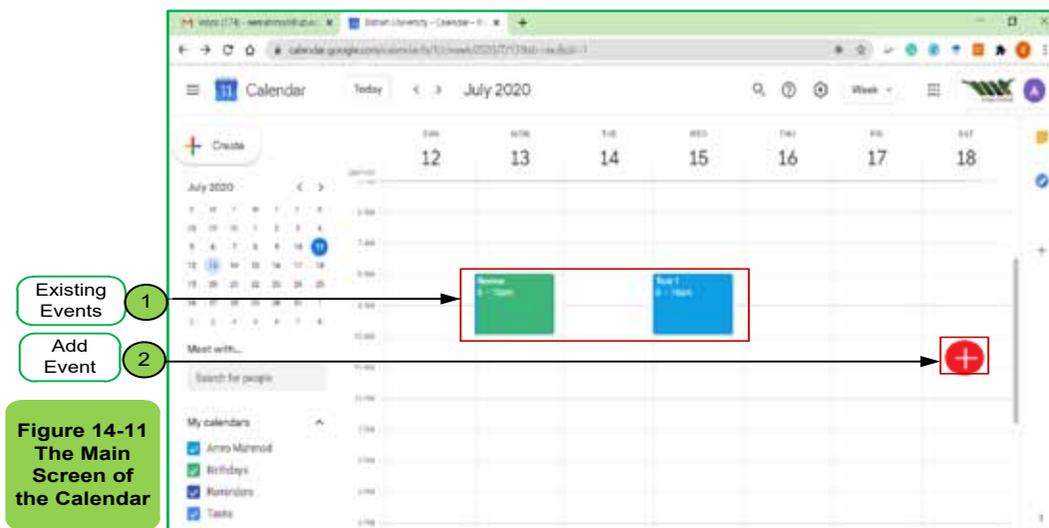
**Skill 14 - 8**  
View and Add Events to the Calendar in E-mail.

A- Calendar service, appointment sit-in and e-mail notifications Google’s calendar service allows the email user to show and add appointments as well as share calendar dates with multiple users. To start using the calendar service after signing in to the email service, click the ‘Apps’ button at the top left of the main page, and then click the Calendar button as in figure 14- 10.

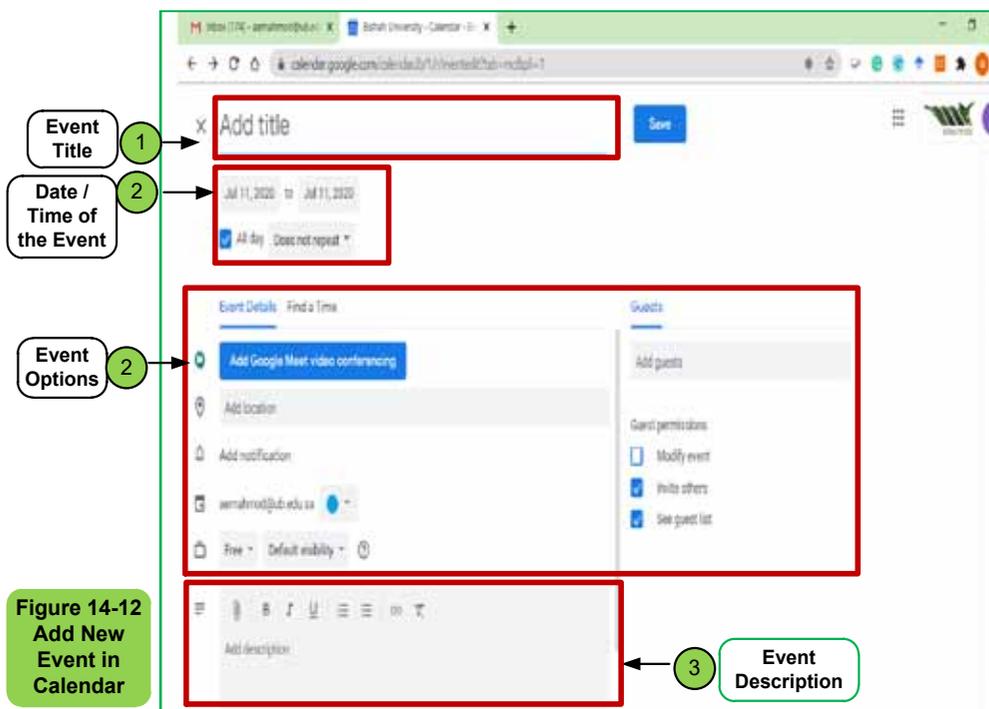


**Figure 14-10**  
Login to  
Calendar

The home screen of the calendar appeared where you can review events and add new events



To add a new event, click on the button + located at the bottom of the left of the screen to show the window to add a new event as in Figure 14- 12 and to add the event select steps from 1 to 4 as in the figure and then press the ‘Save’ button

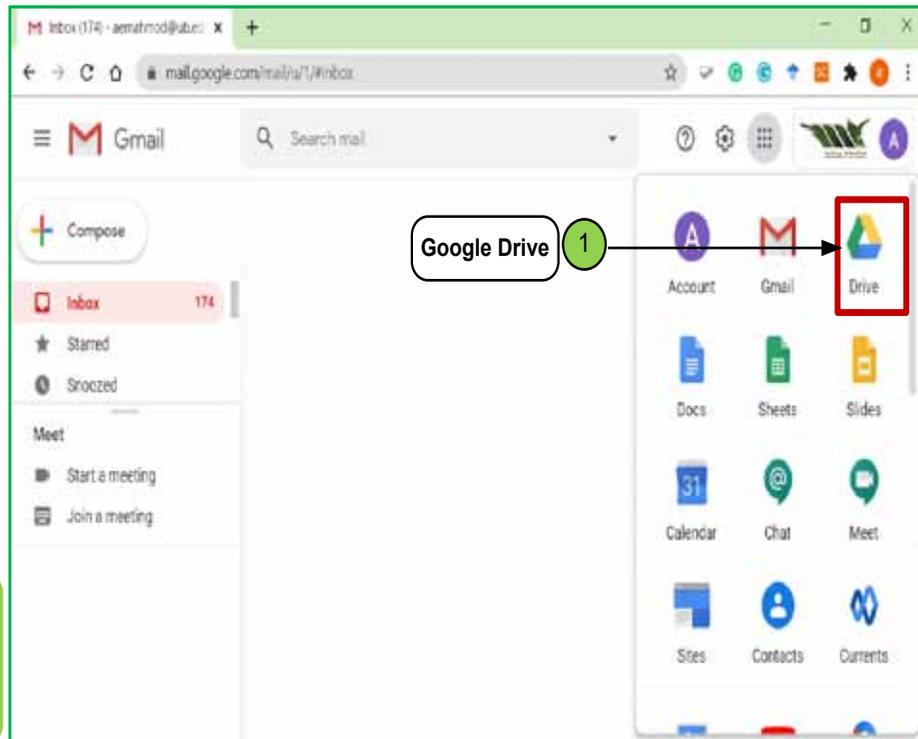


**Skill 14 - 9**  
Upload and Share files on Google Drive.

### 14-5 Share Files on Google Drive

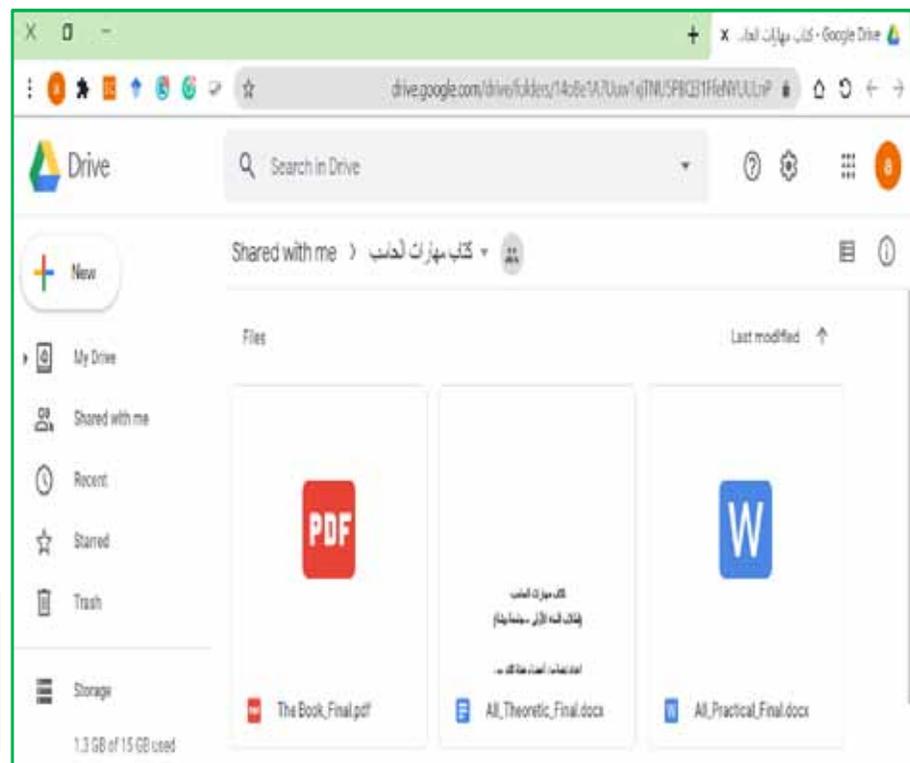
Google Drive is a cloud storage service, introduced by Google. This service offers a storage space of 10 terabytes (10TB) with the university account until

this moment, and you can use Google drive after logging into the email service, click on the 'apps' icon at the top left of the mail home page and then choose the Google Drive code as in Figure 14 -13.



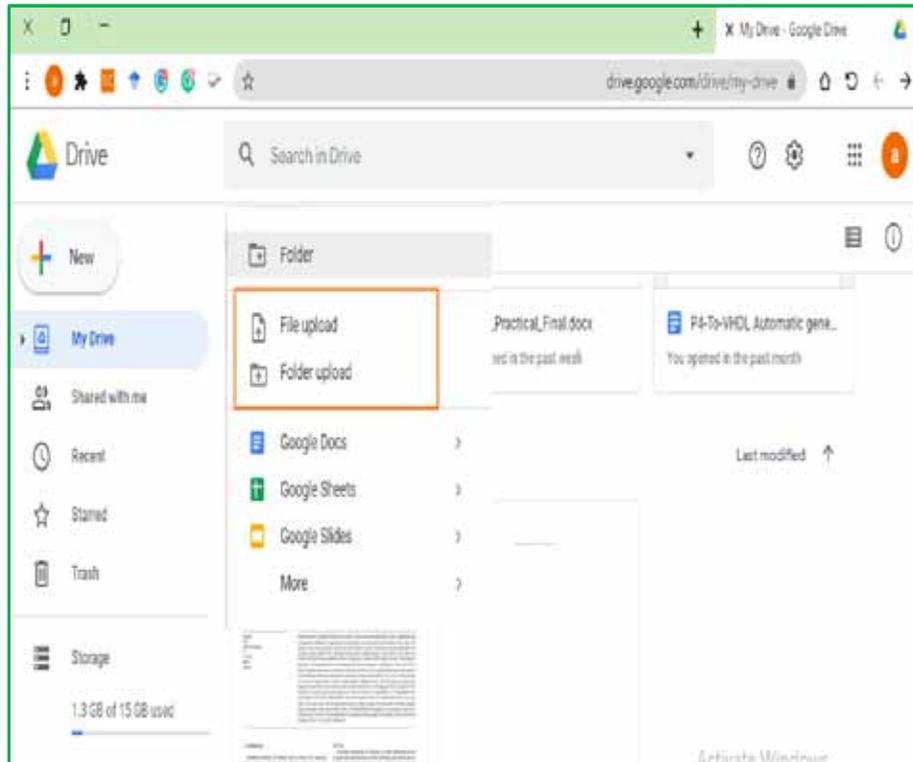
**Figure 14-13**  
Login to  
Google Drive

Google Drive's home screen appears as in Figure 14- 14



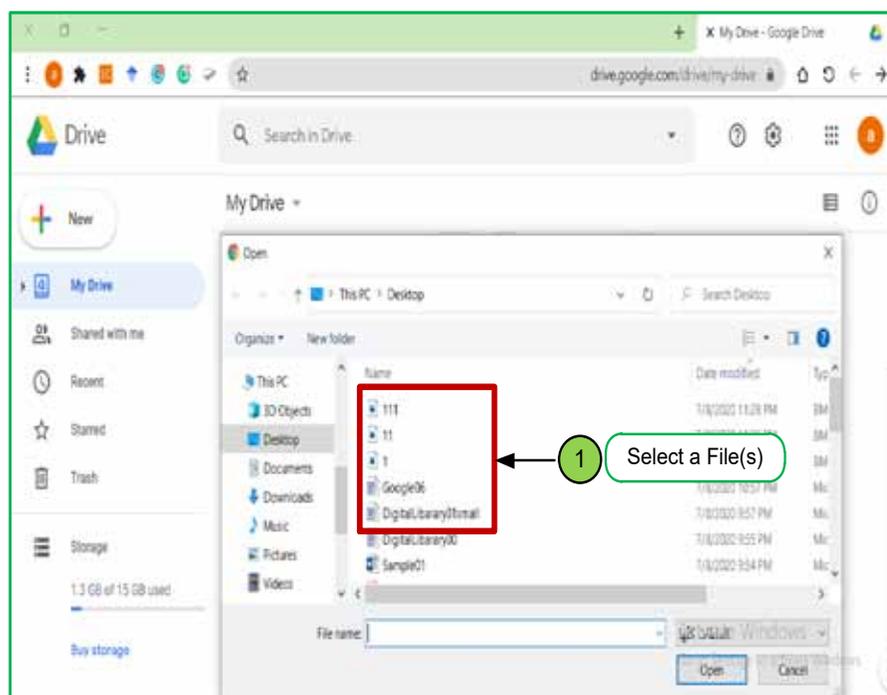
**Figure 14-14**  
The Main  
Screen of  
Google Drive

To start downloading a file click on the mouse left button on 'New' at the top right of the page and then choose 'Download a file' or 'Download a folder'. As in Figure 14- 15



**Figure 14-15**  
Upload Files  
or Folders  
to Google  
Drive

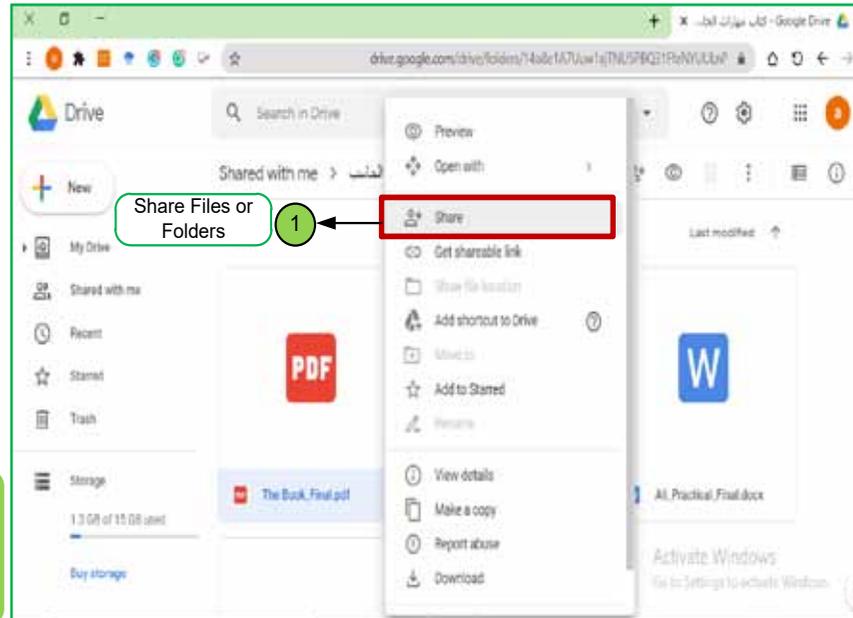
You see a window from which you can choose the file to be uploaded on the drive as in Figure 14- 16



**Figure 14-16**  
Upload File(s)  
or Folder(s)  
to Google Drive

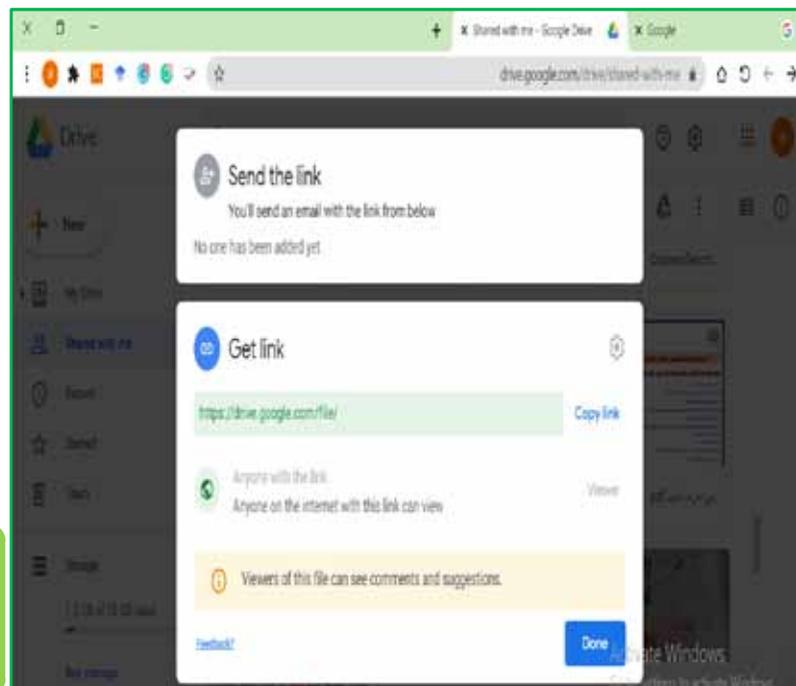
The file or folder is uploaded to your Google Drive account, and the file can be shared with other users to give them the ability to upload, view or edit the file. To start the file sharing process with Google Drive, follow these steps:

- We point on the file to be shared and then click the right mouse button and choose the «Share» button as in Figure 14 -17.



**Figure 14-17**  
Share on  
Google  
Drive

- A window will appear from which the addresses of the people you want to share in the file will be entered as in Figure 14- 18



**Figure 14-18**  
Share File on  
Google Drive

- Enter the address and click on the 'Done'
- It will then appear next to the file or folder: 'Shared', indicating that this file or folder has been shared with other people.

**Skill 14 - 10**

Learn about YouTube's most important features.

**14- 6 YouTube**

YouTube is known as website that allows its users to upload and watch video recordings for free and watch live streaming, other than downloads, and share, comment on, and so on. YouTube was founded in February 2005 by three former employees of the famous PayPal Company, one of whom is a Muslim of Bengali origin, Jaoud Karim. YouTube uses Adobe Flash technology to display animated-videos. The content of the site has varied so much that it now includes film, TV, audio clips, amateur video, and more. In October 2006, Google International reached an agreement to buy the site for \$1.65 billion. According to one statistic, YouTube is the third most popular site in the world right now after Facebook and Google. The website interface is available in copies to suit about 42 countries, a global version, and the YouTube interface is available in 54 languages.

According to the YouTube website's policy, it is not permitted to upload clips containing copyrighted rights to certain people or entities, movie files that offend a particular person, obscene videos, or topics that encourage criminality. YouTube also allows content owners (YouTuber) to make money through Google AdSense to place skippable ads. The Telecommunications and Information Technology Authority oversees Internet censorship in Saudi Arabia, where most sections for adults (18 years or older) or containing insults to Islam or the state are prohibited from display in the Kingdom.

Videos uploaded to YouTube should not exceed 15 minutes for new users but can be longer than that for older users, and not more than 1GB for everyone. Files with the following extensions can be uploaded: WMV, AVI, MOV, MPEG, MP4, and 3GP. 3GP movies can be uploaded directly from the mobile phone via the phone's website, <m.youtube.com>. Files uploaded on YouTube contain MP3 audios and by default, the audio system is individual (mono), at a rate of 64 kbps, with a sampling rate reduced to 22,050 Hz.

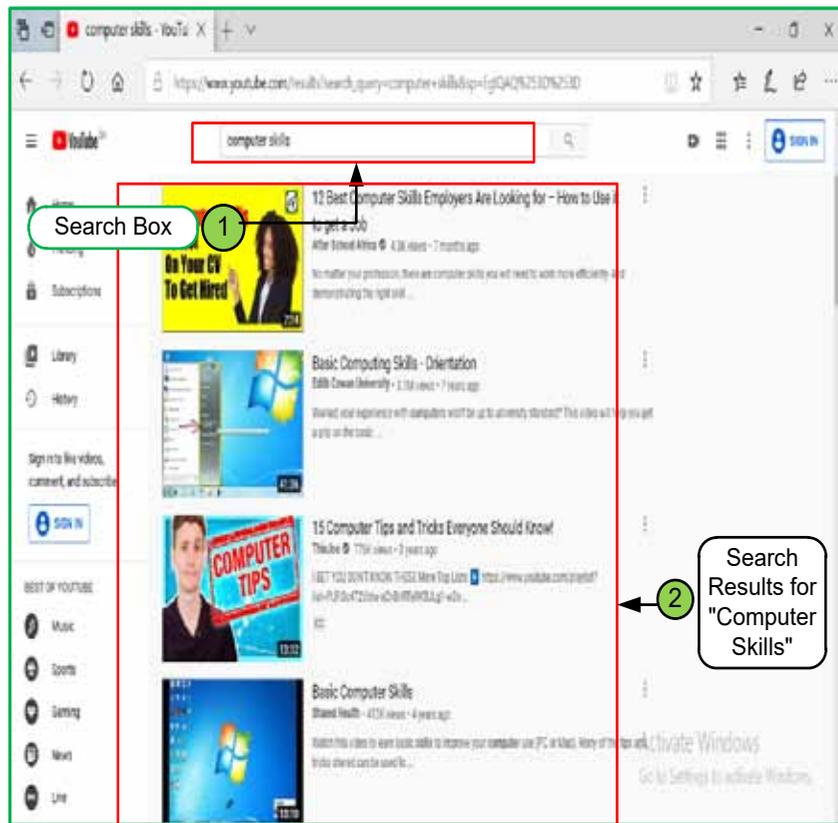


Figure 14-19  
YouTube  
Search  
Interface

### Skill 14 - 11

Learn the Search Interface on YouTube.



#### 14- 6 -1 Search Interface YouTube Website.

Unlike any other social networking sites, YouTube doesn't ask you to create an account before you can search for content or view videos, where you can search and watch anonymously on the site. But if you want to stream audio or video material, you must register for a Google account (get a username and password).

To search the site, just type the search words in the search box and click on the search icon as in Figure 14- 19, and you'll see links to search words from videos, audio clips, etc.

### Skill 14 - 12

How to Filter Search on YouTube.



#### 14 -6 -2 Filter Search on YouTube

You can filter the search by clicking on the filter code so that you can view the links according to the download date, type, duration of the clip, or a specific

feature of the clip such as quality or license, or categorize by the extent to which the section relates to search words or other views, depending on the options of each filter selector, as shown in Figure 14- 20.

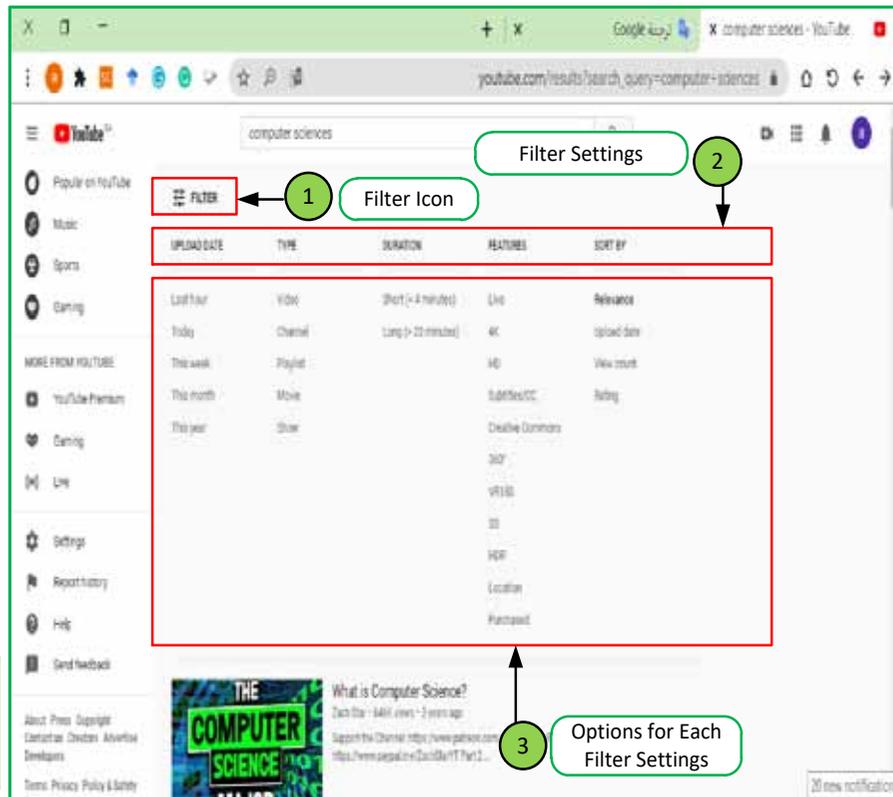


Figure 14-20  
YouTube  
Search  
Interface

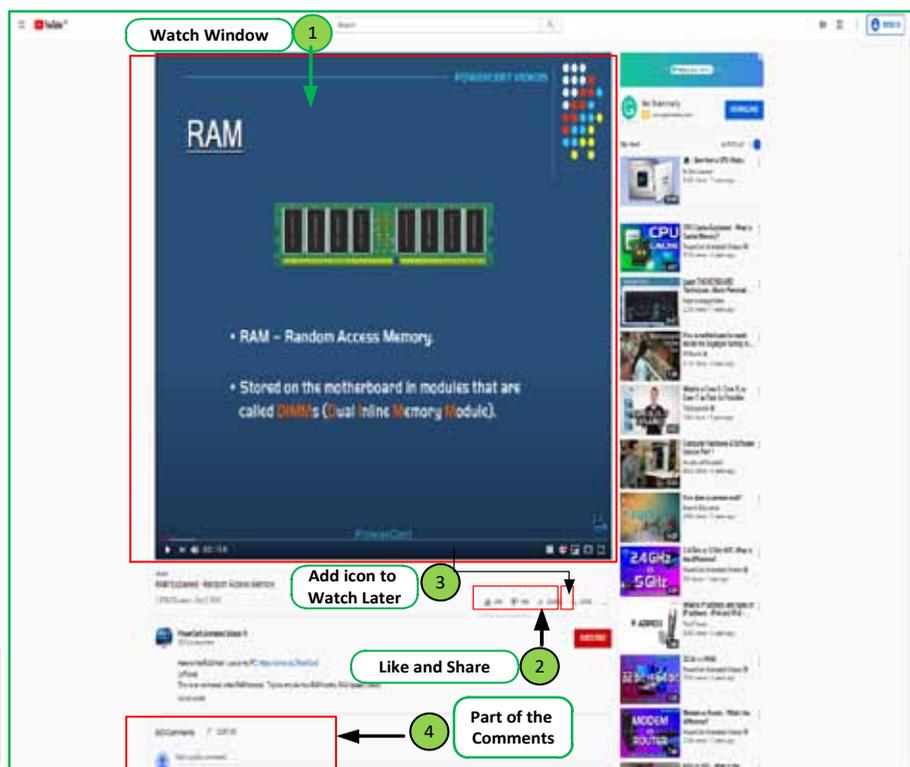


Figure 14-21  
Watch and  
Interact with  
the Clip

### Skill 14 - 13

Watch and Comment on the Clips on YouTube.



#### **14- 6- 3 Watch and Interact with Clips**

After you've searched and filtered our search, you can see the desired section by clicking on the link to that section of the search results list. YouTube takes you to the article view interface to watch or hear. With the view interface, you can record likes or unlike the section, share the section with someone else, or add the section to the playlist to see it later (but you must sign in to enjoy this feature). You can also read information about the section such as the date of publication, the category to which it belongs, the license on YouTube, or comments on the section from other viewers, as well as the ability to comment yourself after signing in, see Figure 14- 21.

### Skill 14 - 14

Restrict Inappropriate Content on YouTube.

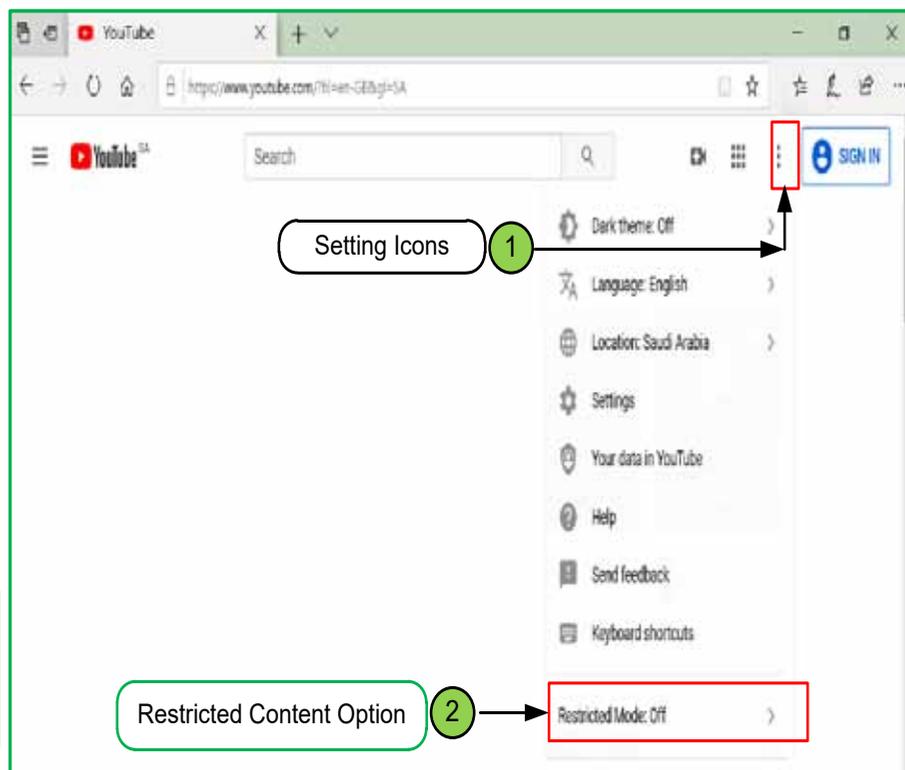


#### **14- 6 - 4 Content Restriction Mode**

Content restriction mode hides videos that are likely to contain inappropriate content reported by users or detected via other signs. This situation should help to avoid the most inappropriate content.

***In order to activate or stop content restriction mode, follow these steps:***

- Click on the Settings button
- Then choose content restriction mode from the bottom of the drop-down menu.
- Then click on the activation button (see Figure 14- 22)



**Figure 14-22**  
Enable or  
Disable  
Content  
Restriction

### Skill 14 - 15

Learn the Most Important Educational Channels on YouTube.



#### 14 -6- 7 Educational Channels on YouTube

It is worth mentioning that YouTube has many educational channels in a variety of areas that you can benefit greatly from during your educational career. In recent times, the demand for learning through YouTube channels has increased significantly more than ever. This may be due to the way many YouTube channels present scientific material in an interesting, interactive, and unconventional way. YouTube has become an environment for receiving specialized channels in education and providing information in various branches of science, reinforced by useful audio-visual means. There are countless educational channels on YouTube, but some may be better than others. For example, some channels can be briefly described as follows:

##### 1. TED-DE

This channel is interested in motivating teachers and students around the world with the participation of their ideas. The channel aims to support learning from producing a growing library of videos to providing an international platform for teachers to create their own interactive lessons to help students around the world gain knowledge. The channel offers scientific materials in many subjects

such as physics, history, stories about scientists, and many other things in a simple and attractive animation way.

### **2. YouTube EDU**

This channel introduces some of the most popular educational videos on YouTube. The channel offers sections on business, languages, education, medicine, biosciences, history and other subjects, and offers interactive lessons for professors specializing in different disciplines.

### **3. Crash Course**

This channel includes many professors specializing in psychology, computer science, history, mythology, and other sciences. All of them offer useful ideas for all categories of the channel subscribers, in a simple, perfect and beautiful graphical way. You can also view playlists of previous courses in physics, philosophy, gaming, economics, government, politics, astronomy, anatomy, physiology, world history, biology, literature, ecology, chemistry, and psychology.

### **4. Khan Academy**

Khan Academy is a non-profit organization that aims to provide a free world-class education to anyone anywhere. It helps students succeed in mathematics, biology, chemistry, physics, history, economics, finance, grammar, and many other subjects through interactive training, essays, and videos. Khan Academy also provides teachers with data on how students perform so they can identify learning gaps and provide personalized guidance. The channel's resources have been translated into dozens of languages, and the channel has more than 3 million followers worldwide.

### **5. Nafham**

Nafham Arabic channel introduces videos to explain school curricula in some Arab countries in a simplified way. One lesson is explained in more than one way through the contributions of teachers, students, and parents, with the aim of more students understanding and spreading useful information to the community. The channel is interested in the different stages of education from primary to secondary, and the videos are 10 to 20 minutes long. The channel contains more than 8,000 videos reviewed by professors specializing in the field of education and various curricula.

### **6. Free4arab**

The channel offers courses in various computer software such as Office, Photoshop, 3D-Max, Networks, and other important programs. The channel has more than 9,000 videos and more than 5,000 subscribers.

To search for a channel in a particular area, just type the keywords for the desired channel in the YouTube search box, then click the search button, and then

through the filter button, you choose the word «channel» of the type selector, as in Figure 14- 23. Channels related to your search words will show you the number of subscribers to the channel. You can choose the right channel and subscribe to it to receive an all-new alert from that channel. See Figure 14 -24.

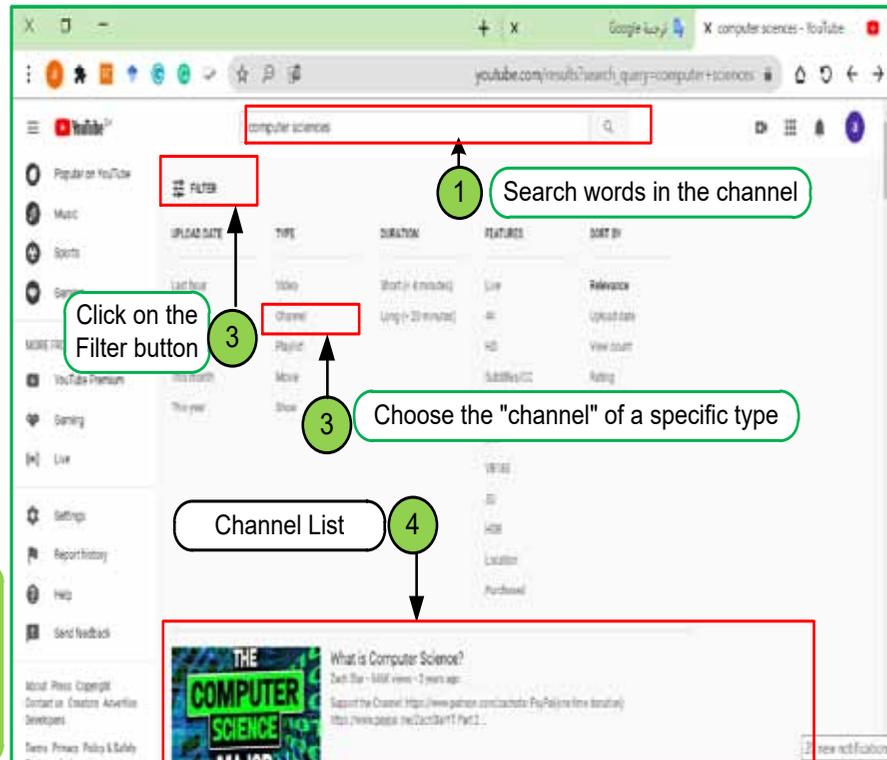


Figure 14-23  
Search for  
Educational  
Channels in a  
Specific Field

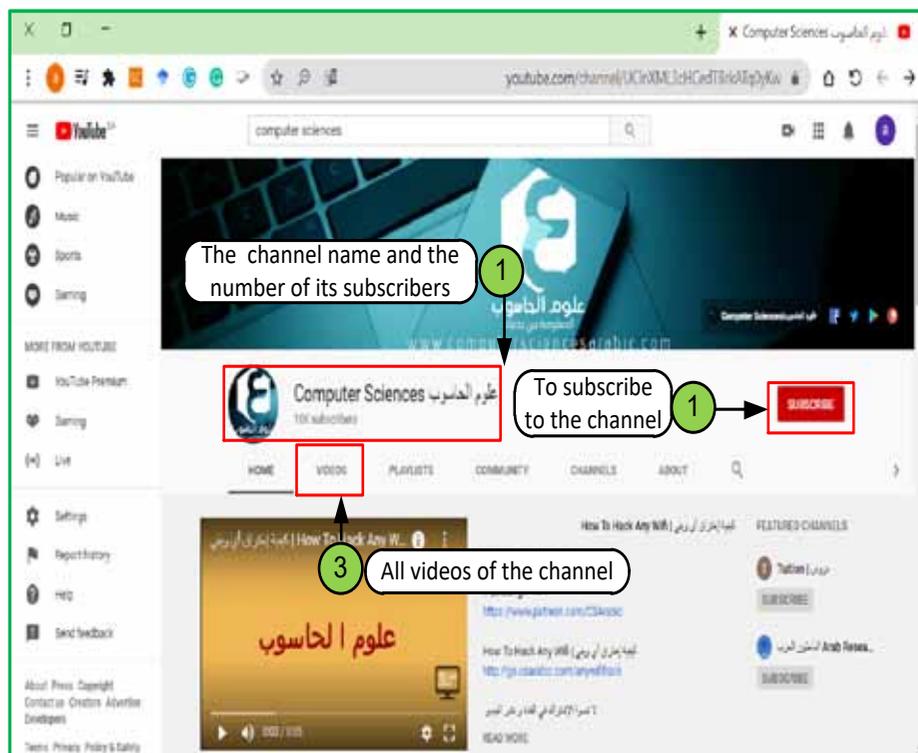


Figure 14-24  
Educational  
Channel  
Details

## Skill 14 - 16

### Create an Account on YouTube.



#### 14- 8 Get a YouTube Account

Google allows people to use any Google account to sign in to YouTube, so they can create custom channels and do all the things allowed. If you don't have a Google account or you don't want to link it to YouTube, you can create a new YouTube account, which necessarily means creating a new Google ID as in Figure 14 -25. You can use your University Gmail account as a YouTube account.

The screenshot shows the 'Create your Google Account' page. The form fields for 'First name', 'Last name', 'Username', 'Password', and 'Confirm' are highlighted with a red box. A green circle with the number 1 and a callout box labeled 'Fields to be filled' points to the 'Next' button. The page also includes a 'Sign in instead' link and a 'Next' button.

Figure 14-25  
Create a  
Google  
Account to  
Login to  
YouTube

## Skill 14 - 17

### Learn the Features of Signing in to Your YouTube Account.



#### 14 -8- 1 Using Basic Activities in YouTube

YouTube login lets you do a lot of things you can't do while browsing the site without signing in, such as:

1. Save your favorite videos to watch faster later.
2. Comment on the videos you see or have an opinion about.
3. Evaluate the video you watched.

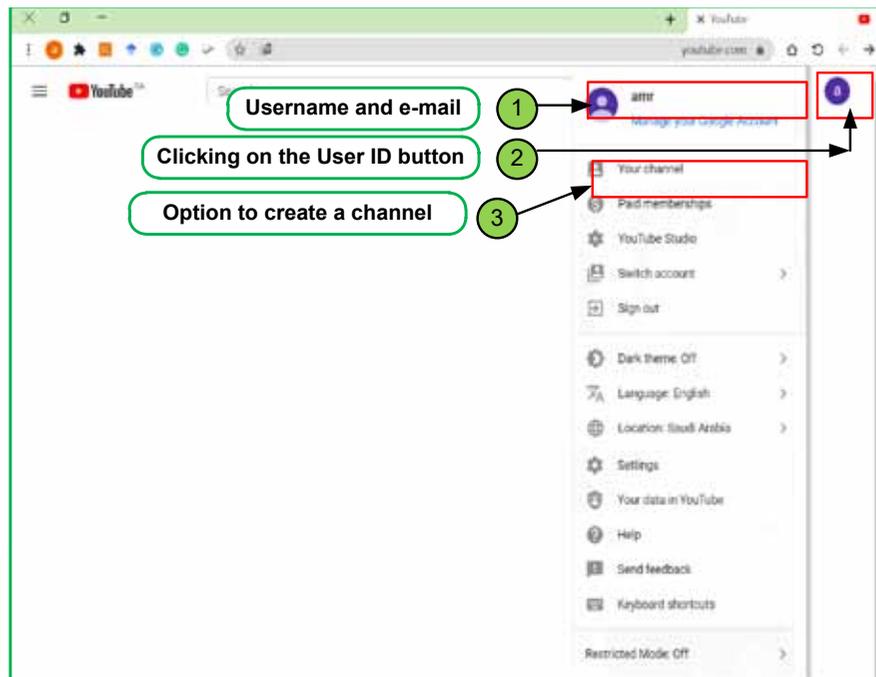
4. Create playlists for videos to watch later.
5. Create and run your own YouTube channel.

**Skill 14 - 18**  
How to Create your Own YouTube Channel.

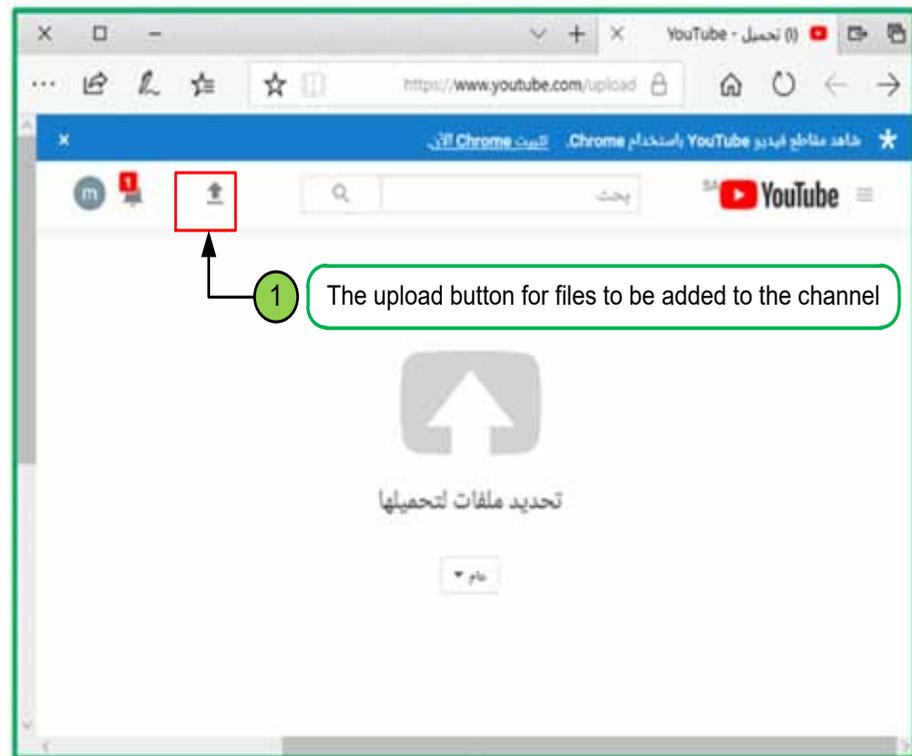


**14 -8 -2 Creating Channel in YouTube**

Once you’ve created a Google account, or you’ve accessed your university email account, you can sign in to YouTube with that account. You will then notice that the user name appears on the left of the window and next to it is the user ID button far left. Now press this button until the drop-down menu appears as in Figure 1426-. Choose from the ‘Creators Studio’ window, and then create a channel. YouTube will ask you some questions about the name of the channel you want to create, and whether you want the name to be the same name as the account you signed in or want another name, choose the right category for the channel, and agree to YouTube terms. Now that you’ve answered questions, you’ve created your own channel, so you can upload the videos you want to add to the channel by clicking the upload button as in Figure 14- 27.



**Figure 14-26**  
Create a  
YouTube  
Channel



**Figure 14-27**  
Upload  
Videos to  
the Channel