



# King Saud University

College of Computer and Information Sciences  
Computer Science Department

	<b>Course Code:</b>	CSC 111
	<b>Course Title:</b>	Computer Programming I
	<b>Semester:</b>	Fall 2011-2012
	<b>Exam:</b>	<b>Final Exam</b>
	<b>Duration:</b>	3 hours

Student Name:	
Student ID:	
Student Section No.	

Tick the Relevant	Computer Science B.Sc. Program ABET Student Outcomes	Question No. Relevant Is Hyperlinked	Covering %
√	a) Apply knowledge of computing and mathematics appropriate to the discipline;	<b>Part I</b>	<b>25</b>
	b) Analyze a problem, and identify and define the computing requirements appropriate to its solution;		
√	c) Design, implement and evaluate a computer-based system, process, component, or program to meet desired needs;	<b>Part II, III</b>	<b>75</b>
	d) Function effectively on teams to accomplish a common goal;		
	e) Understanding of professional, ethical, legal, security, and social issues and responsibilities;		
	f) Communicate effectively with a range of audiences;		
	g) Analyze the local and global impact of computing on individuals, organizations and society;		
	h) Recognition of the need for, and an ability to engage in, continuing professional development;		
√	i) Use current techniques, skills, and tools necessary for computing practices;		
	j) Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;		
	k) Apply design and development principles in the construction of software systems of varying complexity.		

Part II. Complete the methods of the following class  
(20 Marks: 2marks for the first method and 3 marks for each of the other methods)

```
public class Game100 {  
    private int[] itemsCodes ; // stores the code of the items  
    private double[] itemsPrices ; // stores the price of the items  
    private int[] itemsQuantities ; // stores the quantity of the items  
    private int counter ; // counts the number of the inserted items  
  
    public Game100 (int size) { // this constructor is given  
  
        itemsCodes = new int[size];  
        itemsPrices = new double[size];  
        itemsQuantities = new int[size];  
        Counter = 0 ;  
    }  
  
    public int getCounter() { // return the value of counter  
  
        return counter; ..... 2.00  
    }  
  
    public void insertItem(int code, double price, int quantity) {  
        // if the counter does not exceed the size of the array  
        // inserts the data (code, price and quantity) of this new item  
        // we suppose that the code of the item was not inserted before  
  
        if (counter < itemsCodes.length) { ..... 0.75  
            itemsCodes[counter] = code; ..... 0.50  
            itemsPrices[counter] = price; ..... 0.50  
            itemsQuantities[counter] = quantity; ..... 0.50  
            counter++; ..... 0.75  
        }  
  
    }  
  
}
```

```

public double getItemPrice(int index) {
    //returns the price of the item located at index

    if (index >=0 && index < counter) .....0.00
    return itemsPrices[index]; .....0.00
}

public void sellItem(int wantedCodeItem, int wantedQuantity) {
    // if the item that has a code = wantedCodeItem exists
    // and it has a quantity greater or equal to wantedQuantity,
    // it modifies its itemsQuantities value.

    for (int i=0; i<counter; i++) .....0.00
        if (itemsCodes[i] == wantedCodeItem &&
            itemsQuantities[i] >= wantedQuantity) { .....0.00
            itemsQuantities[i] -= wantedQuantity; .....0.00
            return; // depends on the requirement .....0.00
        }
}

public void addQuantity(int codeItem, int newQuantity) {
    // newQuantity is added to the quantity of the item
    // that has the code= codeItem

    for (int i=0; i<counter; i++) .....0.00
        if (itemsCodes[i] == wantedCodeItem) { .....0.00
            itemsQuantities[i] += wantedQuantity; .....0.00
            return; // depends on the requirement .....0.00
        }
}
}

```

Result					
Question No.	Relevant Student Outcome	SO is Covered by %	Full Mark	Student Mark	Assessor's Feedback
I	a	10%	4		
I	a	7.5%	3		
I	a	7.5%	3		
II	c	50%	20		
III	c	25%	10		
Totals		100%	40		
<b>I certify that the work contained within this assignment is all my own work and referenced where required.</b>  <b>Student Signature:</b> _____ <b>Date:</b> _____					<b>Feedback Received:</b>  <b>Student Signature:</b> _____ <b>Date:</b> _____

Part I. (10 Marks)

I.1 What is the printout of the loop?

```
int i = 0;
while (i < 10) {
    if ((i + 1) % 2 == 0)
        System.out.println(i);
    i++;
}
```

Answer I.1: (4 Marks)

1	0.00
3	0.00
5	0.00
7	0.00
9	0.00

I.2 Suppose the input is 2 3 5 4 0. What is the output of the following segment code?

```
Scanner input = new Scanner(System.in);

int number , value =0;
number = input.nextInt();

while (number != 0) {
    if (number > value)
        value = number;
    number = input.nextInt();
}
System.out.println("Value is " + value);
System.out.println("number " + number);
}
```

Answer I.2: (3 Marks)

Value is 5	1.50
number is 0	1.50

```

public int findCheapestItem() {
    //returns the Code of the item that has the minimum price.

    int min_price = Integer.MIN_VALUE; .....0.00
    int min_code = -1; .....0.00
    for (int i=0; i<counter; i++) .....0.00
        if (itemsPrices[i] < min_price) { .....0.00
            min_price = itemsPrices[i]; .....0.00
            min_code = itemsCodes[i]; .....0.00
        }

    return min_code; .....0.00
}

```

```

}

public boolean isItemAvailable(int codeItem) {
    // if the item with codeItem exists and its Quantity
    // is greater than zero it returns true otherwise it returns false.

    for (int i=0; i<counter; i++) .....0.00
        if (itemsCodes[i]==codeItem && itemsQuantities[i]>0) .....0.00
            return true; .....0.00
    return false; .....0.00
}

```

}

Part III. Complete the following Java program that uses Game100 to do the following:

- a- Create an object of the class Game100 that can process 200 items
- b- Insert the item that has the following data:  
Code = 12345, price = 24.95, quantity= 1200
- c- Insert one item where its data (code, price and quantity) is entered by the user
- d- Add 20 to the quantity of the cheapest item
- e- Display the prices of all the inserted items

Answer part III: (10 Marks: 2 marks for each question)

```
import java.util.Scanner;

public class TestGame100 {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);

        Game100 obj = new Game100(200); ..... 2.00

        Obj.insertItem(12345, 24.95, 1200); ..... 2.00

        Obj.insertItem(input.nextInt(),
                       input.nectDouble(),
                       input.nectInt()); ..... 2.00

        int cheapestCode = obj.findCheapestItem(); ..... 1.00
        obj.addQuantity(cheapestCode, 20); ..... 1.00

        for (int i=0; i< obj.getCounter(); i++) ..... 1.00
            System.out.println(obj.getItemPrice(i)); ..... 1.00

        // or, simply:
        // System.out.println(obj.getItemPrice(0));
        // System.out.println(obj.getItemPrice(1));

    }
}
```

I.3 Convert the following 'if statement' using a 'switch' statement

```
// Find interest rate based on year
if (numOfYears == 7)
    annualInterestRate = 7.25;
else if (numOfYears == 15)
    annualInterestRate = 8.50;
else if (numOfYears == 30)
    annualInterestRate = 9.0;
else {
    System.out.println("Wrong number of years");
}
```

Answer I.3: (3 Marks)

```
switch (numOfYear) {.....0.00
    case 7: annualInterestRate = 7.25; .....0.00
        break; .....0.00
    case 15: annualInterestRate = 8.50; .....0.00
        break; .....0.00
    case 30: annualInterestRate = 9.0; .....0.00
        break; .....0.00
    default: System.out.println("Wrong number of years"); .....0.00
}
```