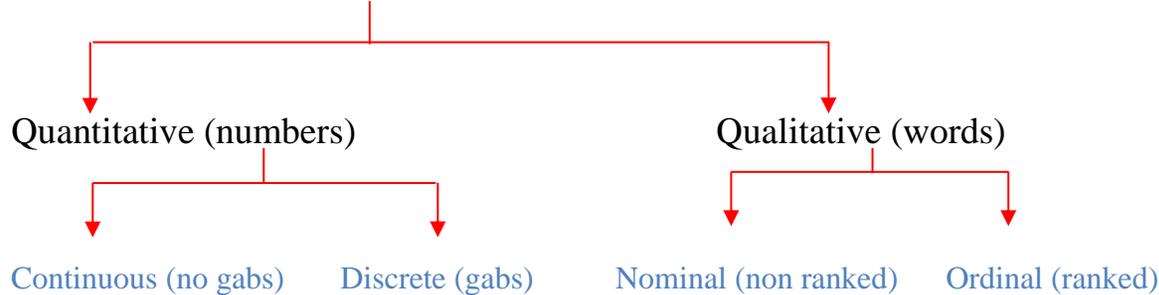


Population (N): largest collection of elements

Sample (n): part of the population

Variable (what is measured in the elements?)



Sampling Techniques



KEY WORDS FOR THE EXCERSICES:

Level → Qualitative ordinal Yes or No questions → Qualitative nominal

Age , Weight → Quantitative continuous

Frequency Distribution

- 1- Order array (smallest → largest)
- 2- Class intervals (lower limit (L) – upper limit (U))
- 3- Mid-point = $\frac{U+L}{2}$
- 4- True class interval

$$d = L - U \text{ (preceding class interval)}$$

$$\text{true upper limit} = U + \frac{d}{2}$$

$$\text{true lower limit} = L - \frac{d}{2}$$

- 5- Frequency → relative frequency = $\frac{f}{n}$
 ↓ Precantage frequency = $\frac{f}{n} \times 100\%$

- 6- Cumulative frequency → cumulative relative frequency = $\frac{cf}{n}$
 ↓ cumulative recantage frequency = $\frac{cf}{n} \times 100\%$

7- Width = 2nd lower limit – 1st lower limit

8- To present the frequency distributions

Histogram (class interval or mid point) polygon (mid point)

descriptive measures

Measure of central tendency:

1- Mean

population (μ) sample (\bar{X})

2- Median نعتمد الترتيب ثم الشطب

3- Mode

Measure of dispersion (variation)

1- Range = Max - Min

2- Variance (connected to the mean)

population (σ^2) Sample (S^2) ($unit^2$)

3- Standard Deviation (square root of the variance)

population (σ) Sample (S)

4- coefficient of variation (unit-less) (free of unit)

$$C.V = \frac{S}{\bar{X}} \times 100\%$$

Population	Sample
- Parameter	- Statistic
- Unknown	- Known
	- Used to approximate parameters

Probability → $P(E) = \frac{n(E)}{n(\Omega)}$, $P(\Omega) = 1$, $P(\phi) = 0$

Union → key word: (or) (+) , $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

Intersection → key word: (and) (×) , $P(A \cap B)$

Complement → key word: (not) , (A^c) (\bar{A}) , $P(A^c) = 1 - P(A)$

Conditional probability → key word: (given) , $P(A|B) = \frac{P(A \cap B)}{P(B)}$

Exhaustive events → $P(A \cup B) = 1$

Disjoint (Mutually exclusive) → $P(A \cap B) = 0$

Independent → $P(A|B) = P(A)$, $P(A \cap B) = P(A) P(B)$