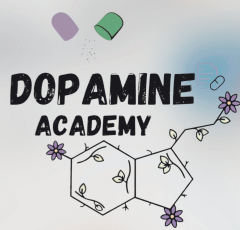


Statistics

Subject: Lecture 6



لجان الرفعات



Subject :

Measures of position :- are used to describe the relative location of an observation

Quantile systems :- that cut data into more than four ranges.

Q_3 Q_2 Q_1 : (Quartile) أرباع
75% 50% 25%

↓
Median

تجاني أحتال سؤال مهم !

3 Quartiles → 4 groups

9 Deciles → 10 ways

4 Quintiles → 5 ways

99 Centiles → 100 ways

Measures of position :-

1. percentiles 2. Quartiles 3. five Number Summary 4. Boxplot

$P_{40} = 15 \rightarrow 40\% \downarrow 15$ and $60\% \uparrow 15$

finding the score given a percentile :-

النسبة المئوية المستخدمة

$$L = \frac{K}{100} \cdot n$$

موقع القيمة
التي بدور عليها

عدد الكلي للقيم

then, you add 0.5 to find the exact position

Quartiles :- divides ranked scores into four equal parts.

"to the left of the median"

Q_1 :- is the median of the bottom half of the ordered observation for a data set

Q_2 :- is the median of the data set ← 50% 50% →

"to the right of the median"

Q_3 :- is the median of the top half of the ordered observation for a data set

► Subject :

A. The Quartiles for Raw Data :-

$n = 15$ (odd) left of MD

MD

right of MD

Ex: 5 10 10 (10) 10 12 15 (20) 20 25 30 (30) 40 40 60

Find the quartiles ?

$$Q_1 = 10$$

$$Q_2 = 20$$

$$Q_3 = 30$$

Since $Q_1 = P_{25}$ $Q_2 = P_{50}$ $Q_3 = P_{75}$ so we can find Q_1, Q_2, Q_3 as following :-

$$L = \frac{K}{100} \times n$$

$$Q_1 = \frac{25}{100} \times 15 = 3.75 + 0.5 = 4.25 \rightarrow Q_1 = 10 \checkmark$$

$$Q_2 = \frac{50}{100} \times 15 = 7.5 + 0.5 = 8 \rightarrow Q_2 = 20 \checkmark$$

$$Q_3 = \frac{75}{100} \times 15 = 11.25 + 0.5 = 11.75 \rightarrow Q_3 = 30 \checkmark$$

B. The Quartiles for ^{Ungrouped} Simple Frequency Table :-

1. Find the cumulative frequency (cf)

$$2. (n = \sum f) \rightarrow \frac{n}{4}, \frac{n}{2}, \frac{3n}{4}$$

$$3. Q_1 : \text{value} \geq n/4 \quad Q_2 : \text{value} \geq n/2 \quad Q_3 : \text{value} \geq 3n/4$$

Ex: Number of Accidents Number of weeks Cumulative Frequency

$\frac{n}{4} = 12.5$	2	5	5
	7	19	24
$\frac{n}{2} = 25$	12	13	37
	17	8	45
$\frac{3n}{4} = 37.5$	22	5	50

$$n = 50$$

$$Q_1 = 7$$

$$Q_2 = 12$$

$$Q_3 = 17$$

Subject: _____

C. The Quartiles for grouped Frequency Table :-

Ex:	Class (Sales Volume) in JD	Number of Days	Cumulative Frequency
$\frac{n}{4} = 7.5$	53 - 56	3	3
	57 - 60	5	$\leftarrow Q_1$ 8
$\frac{n}{2} = 15$	61 - 64	9	$\leftarrow Q_2$ 17
	65 - 68	7	$\leftarrow Q_3$ 24
$\frac{3n}{4} = 22.5$	69 - 72	6	30
4		$n = 30$	

← بعد هذا نطبق على القانون

The Inter-quartile Range (IQR) :- $Q_3 - Q_1$

- is a robust measure of variation.
- is defined as: the range of middle 50% of observation in the data set.
- Median and inter-quartile range are robust indicators of Central tendency and dispersion.

The Five-Number Summary (FNS) :-

- is a set of descriptive measures that provide information about a data set.
- 1. The minimum : Smallest observation
- 2. The lower quartile : first quartile Q_1
- 3. The median : middle value or second quartile Q_2
- 4. The upper quartile : third quartile Q_3
- 5. The maximum : largest observation