

Statistics

Descriptive

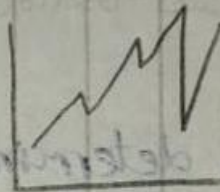
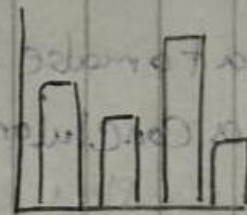
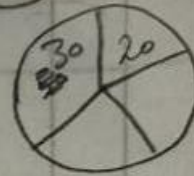
① Organizing and summarizing data using number and graphs.

② Data Summary :-
Bar graphs, Histograms, Pie charts -
Shape of graph and skewness

③ Measures of Central tendency:-

Mean, Median, Mode
the middle number of data set
المتوسط الحسابي
المتوسط الوسيط
المتعدد (القياس)

④ Measures of Variability
Range, Variance, standard deviation.



Mean

Simple mean $\bar{X} = \frac{\sum X}{n}$

المتوسط البسيط

Statistics

Inferential

- ① using Sample data to make an inference or draw a conclusion of the Population.

نمونه البيانات
على ما الفرق؟ فنزيد الحساب

- ② uses Probability to determine how confident we can be that conclusions we make are correct.

(Confidence Intervals and Margins of Error)

نواصل الشرح
(إن إحصائياتنا تكون بنسبة 95%)
أن النتائج واضحة ..

$$\text{mean} = \frac{\sum x}{n}$$

\rightarrow sum of numbers
 \rightarrow number of numbers

example

{12, 7, 14, 5, 7, 11, 9}

$$\text{mean} = \frac{12 + 7 + 14 + 5 + 7 + 11 + 9}{7} = \frac{65}{7} = 9.28$$

في حالة أن يكون عدد القيم زوجي، نأخذ رقمين في المنتصف ونقسمهما على 2

Median = 9 \rightarrow arrange number Ascending

{5, 7, 9, 12, 12, 14}

mode: The number that appears most often

mode = 7

Range = highest number - lowest number

$$14 - 5 = 9$$

* How to calculate Variance

$$S^2 = \frac{\sum (x_i - \bar{x})^2}{n-1}$$

example:-

Set = { 5, 6, 8, 9, 10, 11, 14 }

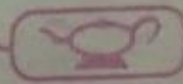
$$\text{mean} = \bar{x} = \frac{\sum x_i}{n} = \frac{63}{7} = 9$$

Data = x_i	$x_i - \bar{x}$	$(x_i - \bar{x})^2$
5	5 - 9 = -4	16
6	6 - 9 = -3	9
8	-1	1
9	0	0
10	1	1
11	2	4
14	5	25

$$S^2 = \frac{\sum (x_i - \bar{x})^2}{n-1}$$

$$\frac{56}{7-1} = \frac{56}{6} = 9.3$$

* كلما Set يكثر تتراوح ما بين بعض الفرق كىس كل ما البيانات

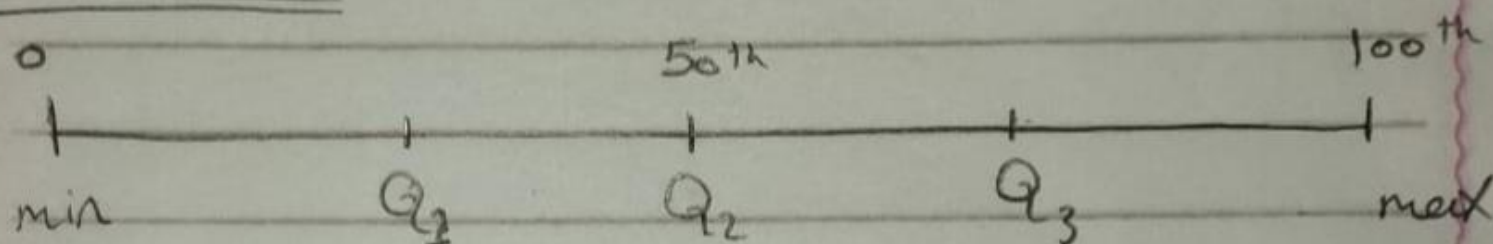


بعض كىس

How to Calculate the Standard deviation

الانحراف المعياري

$$\text{Standard deviation} = \sqrt{\text{Variance}}$$

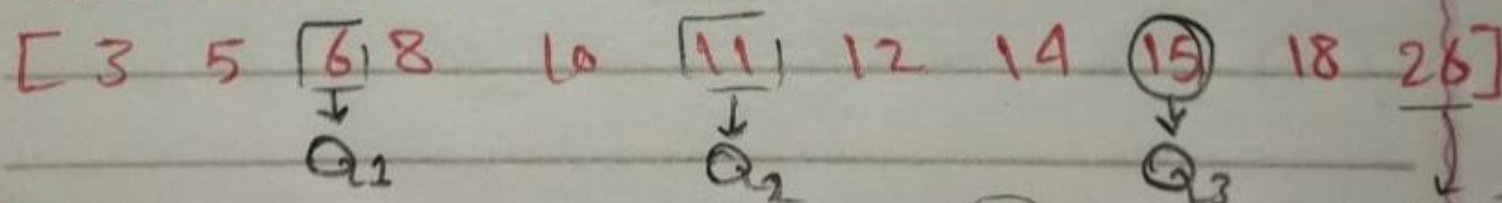


$$IQR = Q_3 - Q_1$$

Interquartile Range

$$\text{outliers} = [Q_1 - 1.5 \times IQR, Q_3 + 1.5 \times IQR]$$

example:-



$$IQR = Q_3 - Q_1 = 15 - 6 = 9$$

$$[Q_1 - 1.5 \times 9, Q_3 + 1.5 \times 9] =$$

$$[-7.5, 28.5]$$

رقم شاذ
عدد أقل من رقم الوسيط في Range
من
outliers