Measures of dispersion

Measures of dispersion

- In statistics, the measures of dispersion help to interpret the variability of data

Types of Measures of Dispersion

- Absolute Measure of Dispersion
- Relative Measure of Dispersion

Absolute Measure of Dispersion

- An absolute measure of dispersion contains the same unit as the original data set.
- It includes

Range

Variance

Standard deviation

Quartiles and quartile deviation

Mean and mean deviation

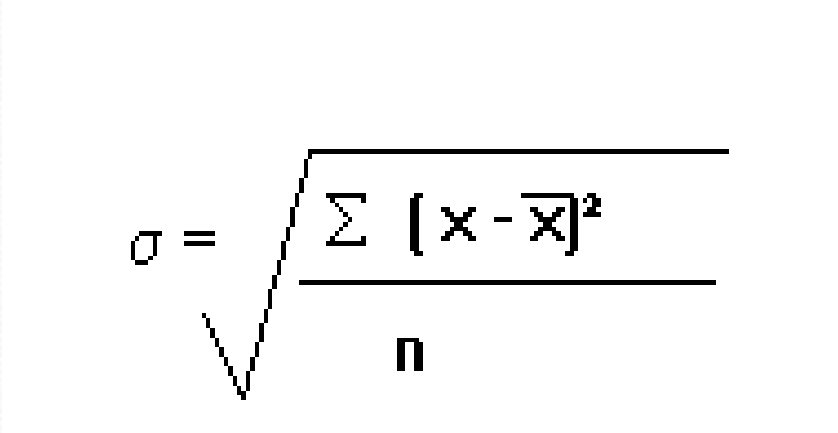
Range

- It is simply the difference between the maximum value and the minimum value given in a data set.
- Example: 1, 3,5, 6, 7

  Range = 7 -1= 6

Standard deviation

The standard deviation measures the spread of the data about the mean value.



Calculate standard deviation from the following data set: 4, 2, 5, 8, 6.

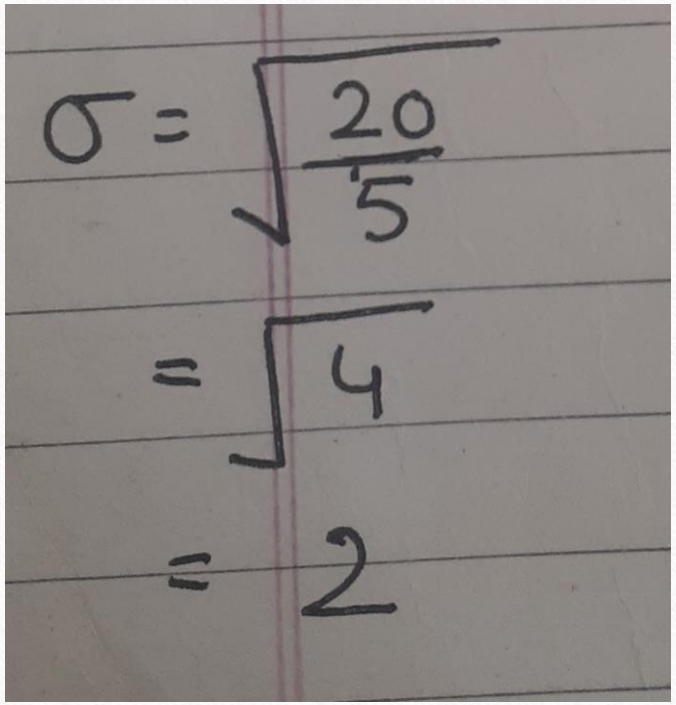
$$\sigma = \sqrt{\frac{\Sigma\,(x-\bar{x})^2}{n}}$$

$$\bar{x} = \frac{4+2+5+8+6}{5} = \frac{25}{5} = 5$$

x	$\bar{x}$	$x-\bar{x}$	$(x-\bar{x})^2$
4	5	-1	1
2	5	-3	9
5	5	0	0
8	5	3	9
6	5	1	1

$$\Sigma(x-\bar{x})^2 = 20$$

Cont…



Variance

The variance is a measure of how far a set of data are dispersed out from their mean or average value.

It is denoted as ‘σ^2’.

Calculate the variance if standard deviation is 5

- Variance= 'σ^2'.
- Standard deviation= σ = 5
- Variance= 'σ^2'= 5^2

  =25

Quartile Deviation (QD)

- Quartile deviation is one of the measures of dispersion.
- Quartiles are the values that divide a list of numerical data into three-quarters, such as Q_1, Q_2 and Q_3.
- Median is represented by Q_2
- QD = $(Q_3 - Q_1)/_2$