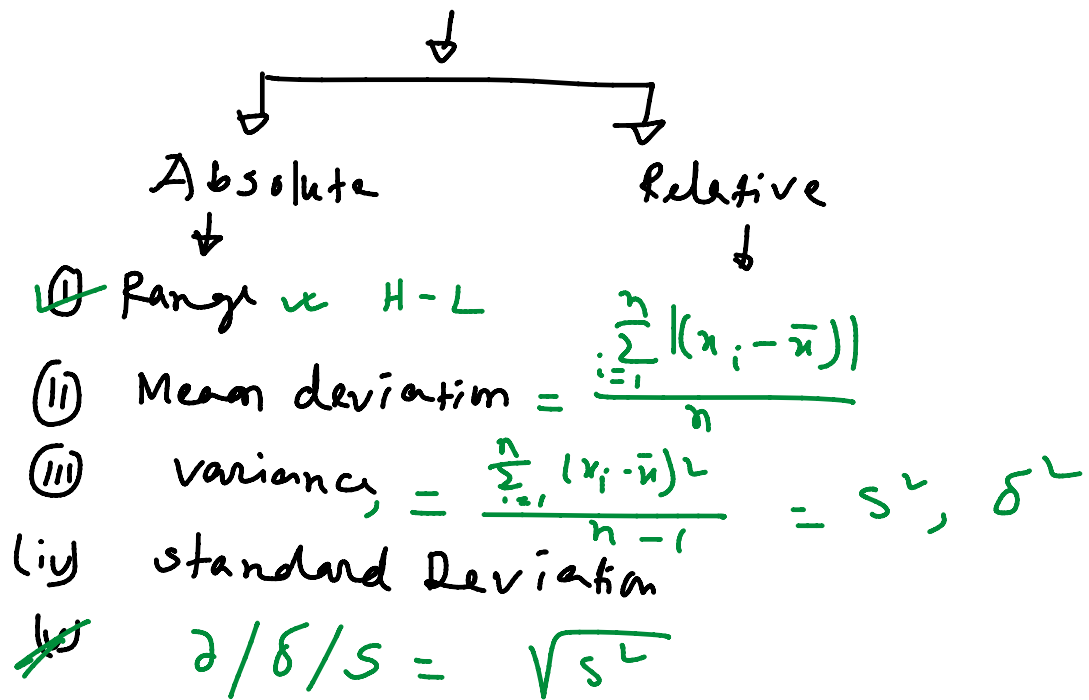


Measures of dispersion



Range: 6, 7, 8, 10, 11, 14

Highest $\rightarrow 14$

Lowest $\rightarrow 6$

\therefore Range = $H - L$

$$= 14 - 6 = 8$$

variation: \rightarrow Range \rightarrow H - L

$$\text{Mean Deviation} = \frac{\sum_{i=1}^n |x_i - \bar{x}|}{n}$$

Where, $x_i =$ Given data for ungroup

$\bar{x} =$ Mean for given data.

\bar{x} = Mean for given data.

$$n = \frac{\text{count of } x}{\text{number of } x}$$

Prob: 2, 3, 3, 3.5, 4, 5, 6.5, 7, 8, 8 [ungroup data]
Find Mean deviation.

Solⁿ: According to the ascending order,

2, - - - - ,

$$n = 10$$

$$\text{Highest} = 8$$

$$\text{Lowest} = 2$$

$$\begin{aligned} \text{Mean, } \bar{x} &= \frac{2+3+3+3.5+4+5+6.5+7+8+8}{10} \\ &= \frac{50}{10} = 5 \end{aligned}$$

$$\therefore \bar{x} = \underline{5}$$

we know, Mean deviation = $\frac{\sum_{i=1}^n |x_i - \bar{x}|}{n}$

x_i	$x_i - \bar{x}$	$ x_i - \bar{x} $	$(x_i - \bar{x})^2$
2	$2-5 = -3$	$ -3 = 3$	$(-3)^2 = 9$
3	-2	2	4
3	-2	2	4
3.5	-1.5	1.5	2.25
4	-1	1	1

4	-1	1	2.25
5	0	0	0
6.5	1.5	1.5	2.25
7	2	2	4
8	3	3	9
8	3	3	9
$n = 10$	$\sum_{i=1}^n x_i - \bar{x} = 19$		$\sum_{i=1}^n (x_i - \bar{x})^2 = 44.5$

$$\therefore \text{M.D} = \frac{19}{10} = 1.9$$

Variance : s^2, σ^2, δ^2

$$\therefore s^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1} = \frac{44.5}{9} = 4.94$$

Standard deviation:

$$s^2 = 4.94$$

$$\therefore s = \sqrt{4.94}$$

$$s^2 = 4.94$$

$$s = \sqrt{4.94}$$

$$= 2.22$$

H.W / Assignment:

10, 12, 14, 13, 9, 20, 25

Find: (i) Range (ii) Mean deviation (iii) Variance
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 variation (iv) ~~σ~~ S.D