Variance

In simple terms Variance is the measure of how far the numbers from a dataset are from its mean (Average) value

To put Variance in mathematical form :-

$$\sigma^2 = \frac{1}{n} \sum_{i=1}^{n} (x_i - \bar{x})^2$$

Where,

n => no. of data points.

x_i => value of a single data point.

$\bar{x}$ => Average of all the data points.

TO put Variance in practice.

Dataset A: 4, 7, 8, 9, 10

(1) Average $= \frac{4+7+8+9+10}{5}$

$= \frac{38}{5}$

$\boxed{\text{Avg} = 7.6}$

Standard deviation

Data point	$x - \bar{x}_A$	Square
4	$4 - 7.6 = -3.6$	12.96
7	$7 - 7.6 = -0.6$	0.36
8	$8 - 7.6 = 0.4$	0.16
9	$9 - 7.6 = 1.4$	1.96
10	$10 - 7.6 = 2.4$	5.76

Adding all SD

$= 12.96 + 0.36 + 0.16 + 1.96 + 5.76$

$= 21.2$

$V = \frac{21.2}{5}$

$V = 4.24$

Dataset B: 2, 4, 6, 8, 10

$$\text{Avg} = \frac{30}{5} = 6$$

$$V = (2-6)^2 + (4-6)^2 + (6-6)^2 + (8-6)^2 + (10-6)^2$$

$$V = 16 + 4 + 0 + 4 + 16$$

$$= \frac{40}{5}$$

$$V = 8$$

$$\boxed{V = 8}$$