STATISTICS

Mean	$\bar{x} = \frac{\Sigma x}{n}$
Median	If n is odd, then $M = \left(\frac{n+1}{2}\right)^{th}$ term; If n is even, then $M = \frac{\left(\frac{n}{2}\right)^{th} \text{term} + \left(\frac{n+1}{2}\right)^{th} \text{term}}{2}$
Mode	The value which occurs most frequently
Variance	$\sigma^2 = \frac{\Sigma (x-\bar{x})^2}{n}$
Standard Deviation	$S = \sigma = \sqrt{\frac{\Sigma (x-\bar{x})^2}{n}}$

x = observations given
n = Total no. of observations
$\bar{x}$ = Mean

Range = Maximum value − Minimum value

Mean Deviation

$$M.D\,(a) = \frac{\text{Sum of absolute values of deviations from 'a'}}{\text{No. of observations}}$$

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$ ($\bar{x}$: Mean)

Mean deviation for ungrouped data

Let n observations be $x_1, x_2, x_3, \ldots x_n$.

$$M.D.(\bar{x}) = \frac{1}{n}\sum_{i=1}^{n}|x_i - \bar{x}| \quad \& \quad M.D.(M) = \frac{1}{n}\sum_{i=1}^{n}|x_i - M|$$

$\bar{x}$ = Mean
M = Median

Mean deviation for grouped data

$$(\bar{x}) = \frac{1}{N}\sum_{i=1}^{n} f_i$$

$$M.D.(\bar{x}) = \frac{1}{N}\sum_{i=1}^{n} f_i|x_i - \bar{x}|$$

$$M.D.(M) = \frac{1}{N}\sum_{i=1}^{n} f_i|x_i - M|$$, where $N = \sum_{i=1}^{n} f_i$

Shortcut method for calculating mean deviation about mean

$$\bar{x} = a + \frac{\sum_{i=1}^{n} f_i d_i}{N} \times h$$

a: assumed mean; h: common factor

$$\text{Median} = l + \frac{\frac{N}{2} - C}{f} \times h$$

Variance and standard deviation

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

Variance (σ^2)
Standard deviation (σ)

Cofficient of variation (C.V.) $= \frac{\sigma}{\bar{x}} \times 100$, $\bar{x} \neq 0$

Variance and standard deviation of a discrete frequency distribution

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

Variance and standard deviation of a continuous frequency distribution

$$\sigma^2 = \frac{1}{N}\sum_{i=1}^{n} f_i(x_i - \bar{x})^2 \qquad \sigma = \sqrt{\frac{1}{N}\sum_{i=1}^{n} f_i(x_i - \bar{x})^2} \quad \text{OR} \quad \sigma = \frac{1}{N}\sqrt{N\sum_{i=1}^{n} f_i x_i^2 - \left(\sum_{i=1}^{n} f_i x_i\right)^2}$$

Shortcut method to find variance and standard deviation

$$\sigma^2 = \frac{h^2}{N^2}\left[N\sum_{i=1}^{n} f_i y_i^2 - \left(\sum_{i=1}^{n} f_i y_i\right)^2\right] \qquad \sigma = \frac{h}{N}\sqrt{N\sum_{i=1}^{n} f_i y_i^2 - \left(\sum_{i=1}^{n} f_i y_i\right)^2}$$

where $y_i = \frac{x_i - A}{h}$