

## Assignment

1) Define Mean, Mode, Median.

\* Mean : The mean is the average of the data set.

\* Median : It is the middle of the set of numbers.

\* Mode : It is the most common number in a data set.

2) Define Standard deviation & Variance.

\* Standard deviation : It is the measure of dispersion of a set of data from its mean. Symbol - ( $\sigma$ )

\* Variance : The variance refers to a statistical measurement of the spread between numbers in a data set.

3) Define population mean & Sample mean.

\* Population mean : It is an average of a group characteristic.

\* Sample mean : It is the arithmetic mean of random sample values drawn from the population.

4) Find Mean, median, mode & standard deviation for each data set.

a) 7, 11, 16, 14, 11, 13, 19, 13, 13

$$\text{Mean} = \frac{\text{Sum of observation}}{\text{num of observations}} = \frac{117}{9} = 13$$

7, 11, 11, 13, 13, 13, 14, 16, 19

odd Median =  $\left(\frac{n+1}{2}\right)^{\text{th}}$

$$= \left(\frac{9+1}{2}\right)^{\text{th}} = \left(\frac{10}{2}\right)^{\text{th}} = 5^{\text{th}}$$

Median = 11

even Mode =  $\left(\frac{n}{2}\right)^{\text{th}} + \left(\frac{n}{2} + 1\right)^{\text{th}}$

$$= \frac{5^{\text{th}} + 6^{\text{th}}}{2}$$

$$\frac{11 + 13}{2} = \frac{24}{2} = 12$$

Median = 12

Median = 13

Mode: Most popular number

Mode = 13

Standard deviation:

$$\text{Mean} (\bar{x}) = \frac{x_1 + x_2 + x_3 + \dots + x_n}{N}$$

$$(\bar{x}) = \frac{7 + 11 + 16 + 14 + \dots + 13}{N}$$

$$\text{Mean} (\bar{x}) = \frac{117}{9} = 13$$

$$x \quad x - \bar{x} \quad (x - \bar{x})^2$$

$$7 \quad -6 \quad 36$$

$$11 \quad -2 \quad 4$$

$$16 \quad 3 \quad 9$$

$$14 \quad 1 \quad 1$$

$$11 \quad -2 \quad 4$$

$$13 \quad 0 \quad 0$$

$$19 \quad 6 \quad 36$$

$$13 \quad 0 \quad 0$$

$$13 \quad 0 \quad 0$$

$$\text{Total} = 90$$

$$\text{Variance} = \frac{90}{19} - 10$$

$$\text{Standard deviation} = \sqrt{10} = 3.16$$

b) 16, 15, 16, 17, 19, 12, 14, 9

$$\text{Mean} = \frac{118}{8} = 14.75$$

odd Median :  $\left(\frac{n+1}{2}\right)^{\text{th}} = \left(\frac{8+1}{2}\right)^{\text{th}} = \left(\frac{9}{2}\right) = 4.5$

even  $= \frac{\left(\frac{n}{2}\right)^{\text{th}} + \left(\frac{n}{2}+1\right)^{\text{th}}}{2}$

$$= \frac{4.5 + 5}{2}$$

$$\text{Median} = 9, 12, 14, 15, 16, 17, 17, 19$$

$$= \frac{16+16}{2} = \frac{31}{2} = 15.5$$

$$\boxed{\text{Median} = 15.5}$$

Mode : Most popular number

$$\boxed{\text{Mode} = 16}$$

Standard deviation :

$$\text{Mean } (\bar{x}) = \frac{16+15+16+17+19+12+14+9}{8}$$

$$= \frac{118}{8} = 14.75$$

$x$	$x - \bar{x}$	$(x - \bar{x})^2$
16	0	0
15	-1	1
16	0	0
17	1	1
19	3	9
12	-4	16
14	-2	4
9	-7	49

$$\text{Total} = 80$$

$$\text{Variance} = \frac{80}{8} = 10$$

$$\text{S.D} = \sqrt{10} = 3.16$$

(g)

- c) 27, 66, 24, 81, 50, 40, 74, 81, 97

$$\text{Mean} = \frac{540}{9} = 60$$

$$\text{Median} = 24, 27, 40, 50, 66, 74, 81, 81, 97$$

$$\boxed{\text{Median} = 66}$$

Mode = Most popular number

$$\boxed{\text{Mode} = 81}$$

standard deviation:

$x$	$x - \bar{x}$	$(x - \bar{x})^2$
97	-33	1089
66	6	36
74	-36	1296
81	21	441
50	-10	100
40	-20	400
74	14	196
81	21	441
97	37	1369

$$\text{Total} = 5368$$

$$\text{Variance} = \frac{5368}{9} = 596.44$$

$$S.D = \sqrt{596.44} =$$

$$S.D = 24.42$$