MATHEMATICS

ASSIGNMENT - 01.

1. Define mean, mode, median.

mean : The Average value

median: The mid point

mode : The most common value.

2. Define standard Deviation and variance.

standard deviation is a number that describes how spread out the values are.

A low standard deviation means that most of the numbers are close to the mean value.

A high standard deviation means that the values are spread out over a wider range.

variance.

variance is another number that indicates how spread out the values are.

standard deviation = $\sqrt{\text{variance}}$

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

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

3. Define population mean and sample mean.

population is the collection of all items of interest to our study and is usually denoted with an uppercase "N"

→ Everything in the group that we want to learn about.

population mean

$$\mu = \frac{\sum_{i=1}^{N} x_i}{N}$$

N = number of items in the population.

Sample:

A sample is a subset of the population and is denoted with a lowercase n.

A part of population drawn according to a rule or plan for concluding characteristics is called sample.

The number of items in a sample is called sample size.

sample mean $\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$

n = number of items in the sample

4. Find mean, median, mode and standard deviation for each data set.

a: 7, 11, 16, 14, 11, 13, 19, 13, 13.

mean = $\frac{7+11+16+14+11+13+19+13+13}{9}$

mean = 13

median : n is odd.

Data in sorted order: 7, 11, 11, 13, **13**, 13, 14, 16, 19

If n is odd, median is $\left(\frac{n+1}{2}\right)^{th}$ term.

∴ **median = 13**

mode : The most common value = 13.

standard deviation

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

$\sum_{i=1}^{n}(x_i - \bar{x})^2 = 36+4+9+1+4+0+36+0+0$

$= 90.$

$\frac{1}{n}\sum_{i=1}^{n}(x_i - \bar{x})^2 = \frac{1}{9}(90) = 10$

$\sigma = \sqrt{10} = 3.162$

standard deviation = 3.162.

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

mean = $\frac{16+15+16+17+19+12+14+9}{8}$

mean = 14.75

median :- Here n value is Even = 8.

median = $\frac{(\frac{n}{2})^{th}+(\frac{n}{2}+1)^{th}}{2}$

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

$= \frac{15+16}{2}$

median = 15.5

mode : common value = 16.

standard deviation

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

$$= \sqrt{\frac{1}{8}(1.5625+0.0625+1.5625+5.0625+18.0625+7.5625+0.5625+33.0625)}$$

$= \sqrt{8.4375}$

SD = 2.9047

c; 27, 66, 24, 81, 50, 40, 74, 81, 97.

mean = $\frac{27+66+24+81+50+40+74+81+97}{9}$

mean = 60

median = n is odd :- $(\frac{n+1}{2})^{th}$ term.

24, 27, 40, 50, **66**, 74, 81, 81, 97

median = 66

mode = The most common value = 81.

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

$$= \sqrt{\frac{1}{9}(1089+36+1296+441+100+400+196+441+1369}$$

$= \sqrt{596.444}$

SD = 24.42