

## ISE 1 - Component 2 : Tutorial

Q.1] A group of students took a math test & test, and the scores are as follows:

85, 90, 88, 92, 78, 95, 90. Calculate the mean, median and mode of the scores.

test scores :- 85 90 88 92 78 95 90

1) mean =  $\frac{85 + 90 + 88 + 92 + 78 + 95 + 90}{7}$

=  $618/7 = 88.28$

2) median = middle number when you place the numbers in ascending order

78, 85, 88, 90, 90, 92, 95

median = 90

3) mode = number with the highest frequency.

= 90

Q.2] The monthly incomes (in dollars) of a sample of 8 employees in a company are : \$4000, \$4500, \$3800, \$4200, \$4800, \$4000, \$3600, \$4500. Calculate the mean, median & mode.

1)

mean =  $\frac{4000 + 4500 + 3800 + 4200 + 4800 + 4000 + 3600 + 4500}{8}$

8



$$\text{mean} = \frac{33400}{8} = 4175$$

mode = 3400, 4500  $\therefore$  mode is 4000 & 4500

median (3600, 3800, 4000, 4000, 4200, 4500, 4500, 4800) =  $\frac{4000+4200}{2} = 4100$   
 $\therefore$  median is 4100

Q.3] The weights (in kg) of a sample of 10 apples are 150, 140, 155, 160, 145, 150, 152, 148, 155, 158. Calculate the mean, median and mode.

$$\begin{aligned} \text{1) mean} &= \frac{150+140+155+160+145+150+152+148+155+158}{10} \\ &= \frac{1513}{10} = 151.3 \end{aligned}$$

$$\begin{aligned} \text{2) median} &= (140, 145, 148, 150, 150, 152, 155, 155, 158, 160) \\ &= \frac{150+152}{2} = 151 \end{aligned}$$

$$\text{3) mode} = 150, 155$$

Q.4] For a set of exam scores, the mean is 75 & the median is 80. What does this suggest about the distribution of scores?

The mean of the set of exam scores is 75.



The median of the set of exam scores is 80. Since, the median is greater than the mean, the distribution of scores must be skewed to the left.

Q.5] Calculate the range of the following dataset: 15, 22, 18, 25, 30, 12, 28.

→ 1) ascending order of data -

12, 15, 18, 22, 25, 28, 30

Lowest value = 12

Highest value = 30

∴ Range = Highest value - Lowest value

$$= 30 - 12 = 18$$

Q.6] The monthly rents (in dollars) for a sample of apartments are: \$1,200, \$1,400, \$1,250, \$1,300, \$1,500. Calculate the variance and standard deviation of the rents.

→ rents ⇒ 1200, 1400, 1250, 1300, 1500

Variance :-

1) The First step is to calculate mean.

$$\therefore \text{mean} = \frac{\text{Sum}}{\text{no. of data points}} = \frac{1200 + 1400 + 1250 + 1300 + 1500}{5}$$

$$= \frac{6650}{5} = 1330$$

Now, take each value in dataset, subtract the mean and square the difference.

$$\therefore (1200 - 1330)^2 + (1400 - 1330)^2 + (1250 - 1330)^2 + (1300 - 1330)^2 + (1500 - 1330)^2$$

$$= 16900 + 4900 + 6400 + 900 + 28900$$

$$= 58000$$



- The sum is then divided by number of data points.  
 $59000 / 5 = 11600$

$\therefore$  The variance is 11600.

2) Standard deviation :-

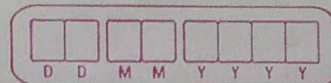
$$\text{Standard deviation} = \sqrt{\text{variance}} = \sqrt{11600} = 107.70$$

$\therefore$  Variance of the rents is \$11600 and  
 Standard deviation is \$107.70.

Q.7] The heights (in cm) of a sample of 12 students are:  
 160, 165, 158, 170, 155, 162, 168, 175, 160, 172, 165,  
 180. Calculate the variance and standard deviation.

$x_i$	$x_i - \bar{x}$	$(x_i - \bar{x})^2$
160	-5.83	33.9889
165	-0.83	0.6889
158	-7.83	61.3089
170	4.17	17.3889
155	-10.83	117.2889
162	-3.83	14.6689
168	2.17	4.7089
175	9.17	84.0889
160	-5.83	33.9889
172	6.17	38.0689
165	-0.83	0.6889
180	14.17	200.7889
$\Sigma x_i = 1990$		$\Sigma (x_i - \bar{x})^2 = 607.6668$





$$\text{mean} = \bar{x} = \frac{\sum x_i}{n} = \frac{1990}{12} = 165.83$$

$$\begin{aligned} \text{Variance} &= \frac{\sum (x_i - \bar{x})^2}{n} = \frac{607.66}{12} \\ &= 50.63 \end{aligned}$$

$$\begin{aligned} \text{Standard deviation} &= \sqrt{\text{variance}} \\ &= \sqrt{50.63} = 7.11 \end{aligned}$$

$\therefore$  Variance is 50.63 cm<sup>2</sup>  
Standard deviation is 7.11 cm.

Q.8] For a set of data the interquartile range (IQR) is 12. If the lower quartile is 20, what is the upper quartile?

→ interquartile range (IQR) = 12  
lower quartile = 20.

$$\begin{aligned} \text{interquartile range} &= \text{upper quartile} - \text{lower quartile} \\ 12 &= \text{upper quartile} - 20 \end{aligned}$$

$$\therefore \text{upper quartile} = 20 + 12 = 32.$$

$\therefore$  upper quartile is 32.