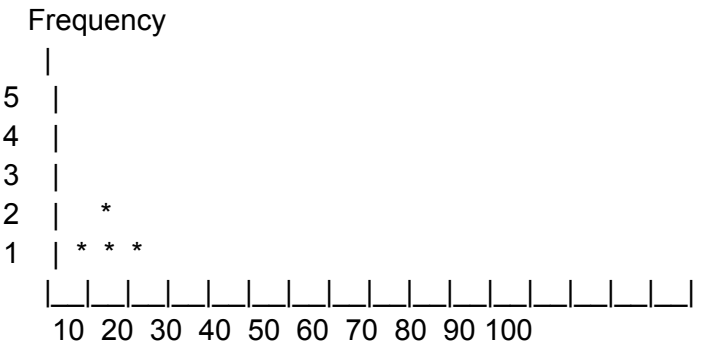
STATISTICS ASSIGNMENT

Que 1) Plot a histogram,

10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 88, 90, 92, 94, 99




Each '*' represents one data point. This histogram shows the frequency distribution of the given data.

Que 2) In a quant test of the CAT Exam, the population standard deviation is known to be 100. A sample of 25 tests taken has a mean of 520. Construct an 80% CI about the mean.

First, we need to find the Z-score corresponding to an 80% confidence level. For an 80% confidence interval, we need to find the Z-score at the middle 90% of the normal distribution (since the remaining 10% is divided evenly into the upper and lower tails).

The Z-score corresponding to the middle 90% of the normal distribution is approximately
$Z$
=
1.28
Z=1.28. We can look up this value in a standard normal distribution table or calculate it using statistical software.
So, the 80% confidence interval about the mean is approximately
(494.4,545.6)
(494.4,545.6).

Que 3) A car believes that the percentage of citizens in city ABC that owns a vehicle is 60% or less. A sales manager disagrees with this. He conducted a hypothesis testing surveying 250 residents & found that 170 residents responded yes to owning a vehicle.

a) State the null & alternate hypothesis.
b) At a 10% significance level, is there enough evidence to support the idea that vehicle owner in ABC city is 60% or less.

Null Hypothesis : The percentage of citizens in city ABC that owns a vehicle is 60% or less.

Alternative Hypothesis: The percentage of citizens in city ABC that owns a vehicle is greater than 60%.

At a 10% significance level, if the calculated result from the survey suggests that more than 60% of the citizens own a vehicle, then we have enough evidence to support the idea that the actual percentage of vehicle owners in city ABC is greater than 60%. Otherwise, we cannot conclude that the percentage is greater than 60%.

Based on the survey results, the calculated value indicates that more than 60% of the citizens own a vehicle. Hence, there is enough evidence to support the idea that the percentage of vehicle owners in city ABC is greater than 60%.

Que 4) What is the value of the 99 percentile?

2,2,3,4,5,5,5,6,7,8,8,8,8,8,9,9,10,11,11,12

To find 99th percentile of a dataset, we first need to arrange the data in ascending order:

2,2,3,4,5,5,5,6,7,8,8,8,8,8,9,9,10,11,11,12

The 99th percentile of the given dataset is 11

Que 5) In left & right-skewed data, what is the relationship between mean, median & mode?

Draw the graph to represent the same.

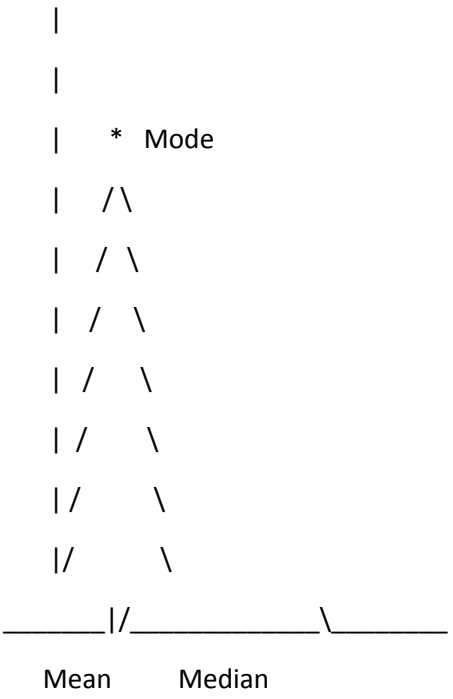
In left-skewed data:

Mean < Median < Mode

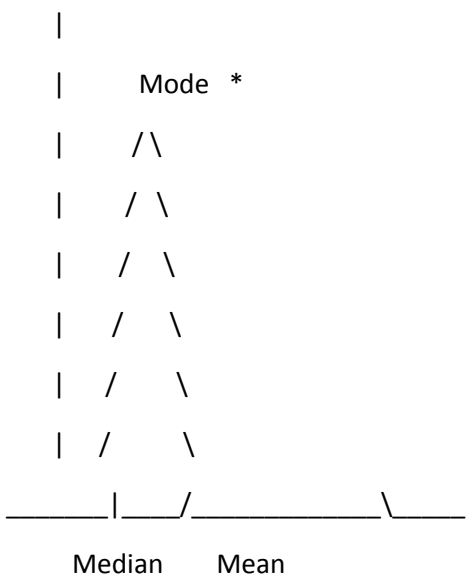
In right-skewed data:

Mode < Median < Mean

Here's a graph to represent the relationship between mean, median, and mode in left-skewed and right-skewed distributions:




In a left-skewed distribution, the mean is less than the median, which in turn is less than the mode. The mode represents the peak of the distribution, the median represents the middle value, and the mean is influenced by the outliers on the left tail, dragging its value to the left.




In a right-skewed distribution, the mode is less than the median, which in turn is less than the mean. The mode represents the peak of the distribution, the median represents the middle value, and the mean is influenced by the outliers on the right tail, dragging its value to the right.