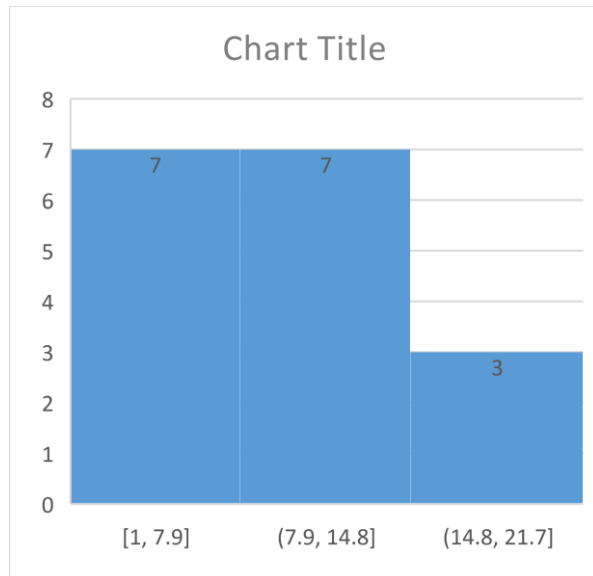Que 1) Plot a histogram,

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



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.

Ans. Given:-    No. of sample (n) = 2s

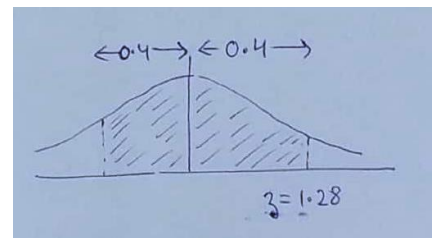        Mean of sample ($\bar{x}$) = 520

        Standard deviation of ($\sigma$) = population

    For 80% confidence  interval = 1.28 value of z

[∵ value in z table for 1.228 ⟶ 0.4 ]



∴ confidence interval :-

$$= \bar{x} \pm z\,(\sigma/\sqrt{n})$$

$$= 520 \pm 1.28\,(100/\sqrt{25})$$

$$= 520 \pm 25.6$$

$$= (49.4\,,\,545.6)\text{so}$$

So we are 80% confident that the population mean lies between 49.4 and 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.

Ans. Null Hypothesis : % of citizen who own car in a city ABC is ≤ 60%

$H_0 : \mu > 0.6$

Alternate Hypothesis : % of citizen who own vehicle in city ABC >60%

$H_a : \mu > 0.6$

Let X be R.V. denoting no. of residents owning vehicle

Now , No. of residents surveyed (n) = 250

No. of residence who own vehicle (x) = 170

$\therefore$ pro. Of owing vehicle $= p = 0.6$

So (1-p) $= 0.4$

So x follow binomial dist.

Mean $= np = 250\,(0.6)$

S.D. $= \sqrt{npq} = \sqrt{250(0.6)(0.4)} = 7.746$

$\therefore z = ( x - np ) / \sqrt{npq} = (170 - 150)/7.746 = 2.582$

Now z > 1.65

So 10% significance level there is very less evidence in f null hypothesis (or no evidence )


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

Ans. **P = n/N*100**

**P = (nth percentile/100 * Total number of values in the list )**

Here n = ordinal rank of the given values or values below number

    N = Number of values in the dataset

    P = Percentile

    Rank = Percentile /100

     Ordinal rank for percentile values = Rank x Total number of values in the list
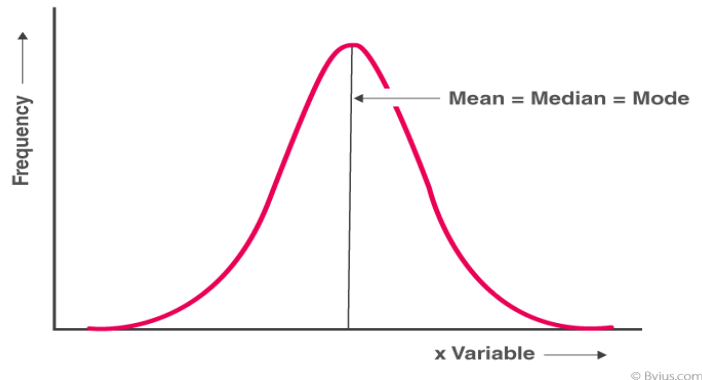
P =   (20*20)/100 = 4

The values of 99 percentile is **4**

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

Draw the graph to represent the same.

Ans. In statistics, for a moderately skewed distribution, there exists a relation between mean, median and mode. This mean median and mode relationship is known as the "empirical relationship" which is defined as Mode is equal to the difference between 3 times the median and 2 times the mean.

- Mean is the average of the data set which is calculated by adding all the data values together and dividing it by the total number of data sets.
- Median is the middle value among the observed set of values and is calculated by arranging the values in ascending order or in descending order and then choosing the middle value.
- Mode is the number from a data set which has the highest frequency and is calculated by counting the number of times each data value occurs.

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