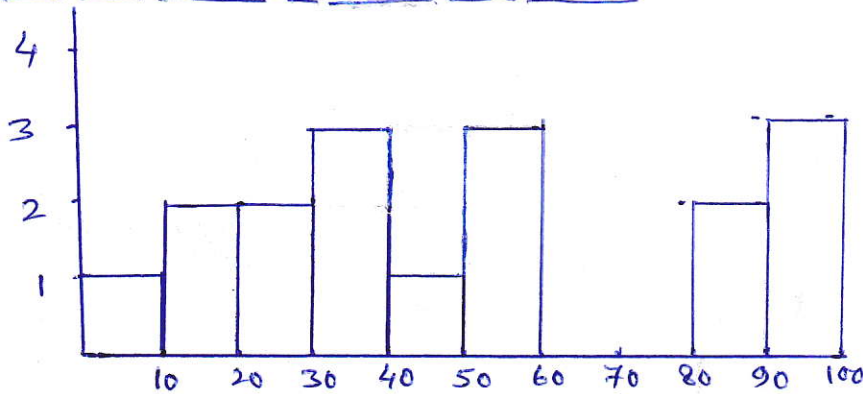


Que 1) Plot a histogram,

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

Ans:



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:

$$\sigma = 100$$

$$n = 25$$

$$\bar{x} = 520$$

Significance $\alpha = 1 - 0.80 = 0.20$

Point Estimate \pm Margin Error

$$= \bar{x} \pm z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$$

$$= 520 \pm z_{\frac{0.20}{2}} \times \frac{100}{\sqrt{25}}$$

$$= 520 \pm .81594 \times \frac{100 \times 20}{5}$$

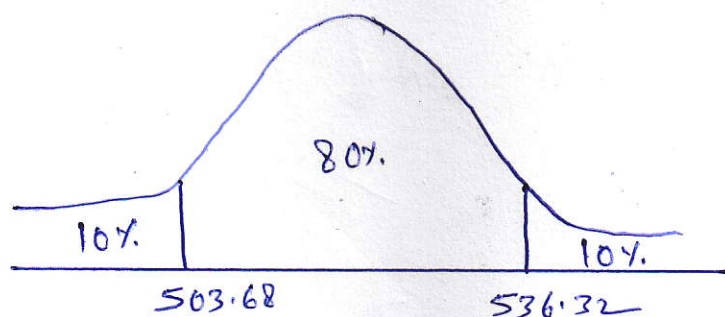
$$[z_{.10} = 1 - 0.1 = 0.9]$$

$$= 520 \pm (.81594 \times 20)$$

From z table z value = .81594

$$\therefore \text{Lower limit} = 520 - (.81594 \times 20) = 520 - 16.312 = 503.68$$

$$\& \text{ Higher limit} = 520 + (.81594 \times 20) = 520 + 16.312 = 536.32$$



Que 3) A car company 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.

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

Ans:
 (a) Null Hypothesis $H_0 : P_0 \leq 60\%$
 $H_1 : P_0 \neq 60\%$

(b) Significance $\alpha = 0.10$,

$$P_0 = 0.60, \quad \hat{P} = \frac{x}{n} = \frac{170}{250} = \frac{17}{25} = 0.68$$

$$q_0 = 1 - P_0 \\ = 1 - 0.60 = 0.40$$

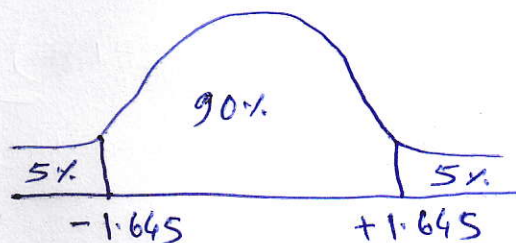
$$Z_{\text{test}} = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.60 \times 0.40}{250}}} = \frac{0.08}{0.03098} = 2.582$$

As $\alpha = 10$, $CI = 1 - \alpha = 90\%$.

$$Z_{\text{score}} = 1.645$$

As

$$2.582 > 1.645$$



We can Reject the Null Hypothesis.

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

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

Ans) value = $\left\{ \frac{\text{Percentile}}{100} \times (n+1) \right\}^{\text{th}} \text{Index} = \frac{99}{100} \times 21$
 $= 0.99 \times 21 = 20.79^{\text{th}} \text{Index}$

So, ~~the~~ 99 percentile of the given dataset should be 20th or the last data of the dataset that is 12.

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

Draw the graph to represent the same.

Ans) In every Right Skewed data always
Mean > Median > Mode

In every Left Skewed data
Mode > Median > Mean.

