

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.

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.

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

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

Draw the graph to represent the same.

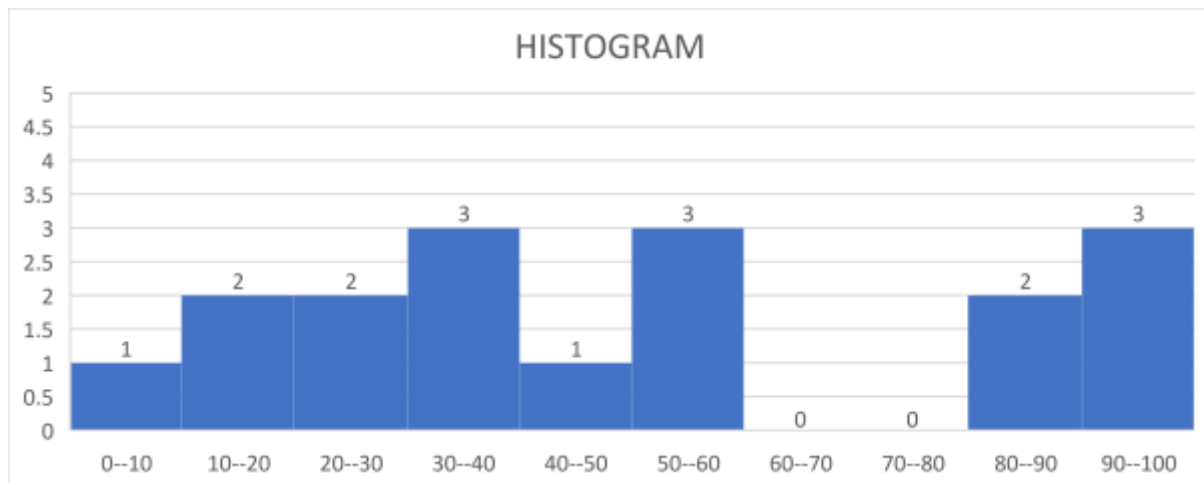
Que 1) Plot a histogram,

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

Value Range = 0-100

No of Bins(Groups)=10

Bins size =  $100/10 = 10$



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.

$$\sigma = 100$$

(std)

$$\bar{x} = 520$$

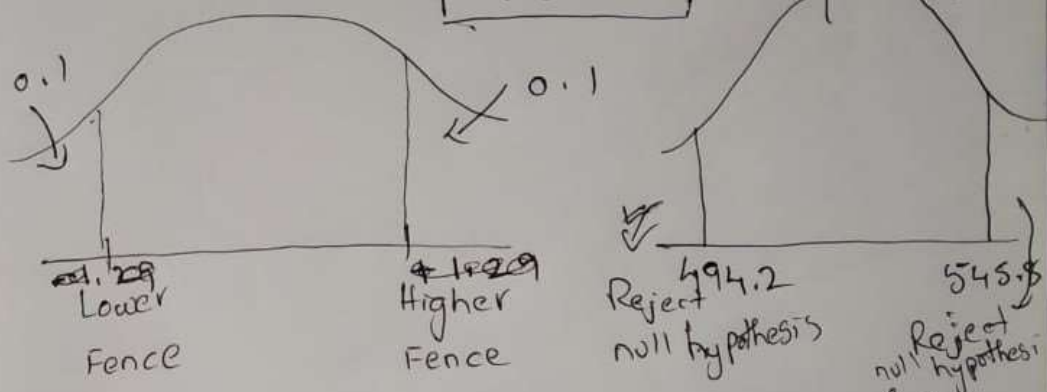
$$n = 25$$

$$C.I = 80\% = 0.8$$

$$\alpha = 0.2$$

$$\text{Significance value } \alpha = 1 - 0.8$$

$$\alpha = 0.2$$



$$\text{Parameter} = \text{Point Estimate} \pm \text{Margin of Error}$$

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

$$= z_{\frac{0.2}{2}} = \bar{x} \pm 1.29 \frac{100}{\sqrt{25}}$$

$$= z_{0.1} \quad \text{Lower Fence} \quad \text{Higher Fence}$$

$$= 1.29 \Rightarrow \bar{x} - z_{\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}} \quad \Rightarrow \bar{x} + z_{\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}$$

$$= 520 - 1.29 \times \frac{100}{\sqrt{25}} \quad \Rightarrow 520 + 1.29 \times \frac{100}{\sqrt{25}}$$

$$= 520 - 25.8 \quad \Rightarrow 520 + 25.8$$

$$= 494.2$$

$$\Rightarrow 545.8$$

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.


1) Null Hypothesis ( $H_0$ ) :  $P_0 \leq 60\%$   $n = 260$   
 $(H_1) : P_0 > 60\%$   $x = 170$

$Q_0 = 1 - P_0$   
 $= 1 - 0.6$   
 $= 0.4$

proportion  $\hat{p} = \frac{x}{n}$   
 $= \frac{170}{260} = 0.65$

2) Significance value  $\alpha = 0.01$  (10%)  
C.I. = 90% = -2.32

\* 1 tail test



Reject -2.32  
Null hypothesis

\* Z-Test with proportion

$$Z_{test} = \frac{\hat{p} - P_0}{\sqrt{\frac{P_0 Q_0}{n}}}$$

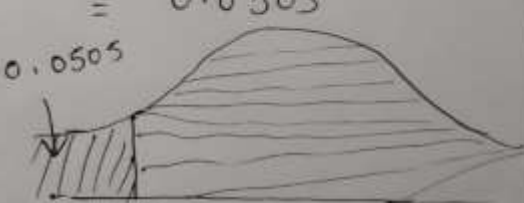
$$= \frac{0.65 - 0.6}{\sqrt{\frac{(0.6)(0.4)}{260}}}$$

$$\approx 1.64570$$

1.64570 > -2.32  
[Accept the Null hypothesis]

\* P-value

$$= 1 - 0.94950$$

$$= 0.0505$$


-1.645 one tail test

P-value = 0.0505  
 $\alpha = 0.01$   
P-value >  $\alpha$   
Accept the Null hypothesis

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

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

sol    number of data values  $n=20$

$$\text{Value} = \text{percentile}/100*(n+1)$$

$$= 99/100*(21)$$

$$= 20.79(\text{index})$$

Value at index 20.79 is 12

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

Draw the graph to represent the same.

