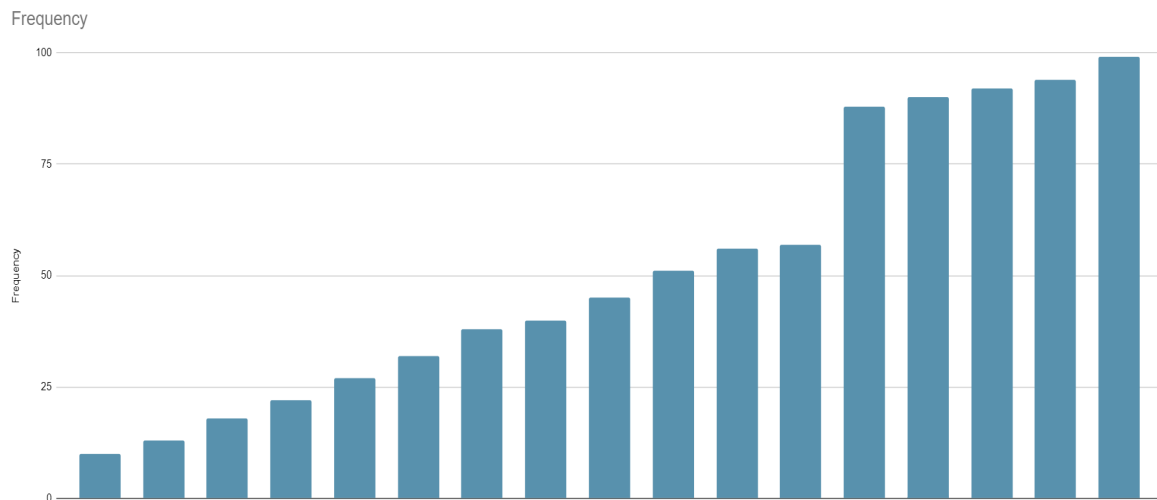
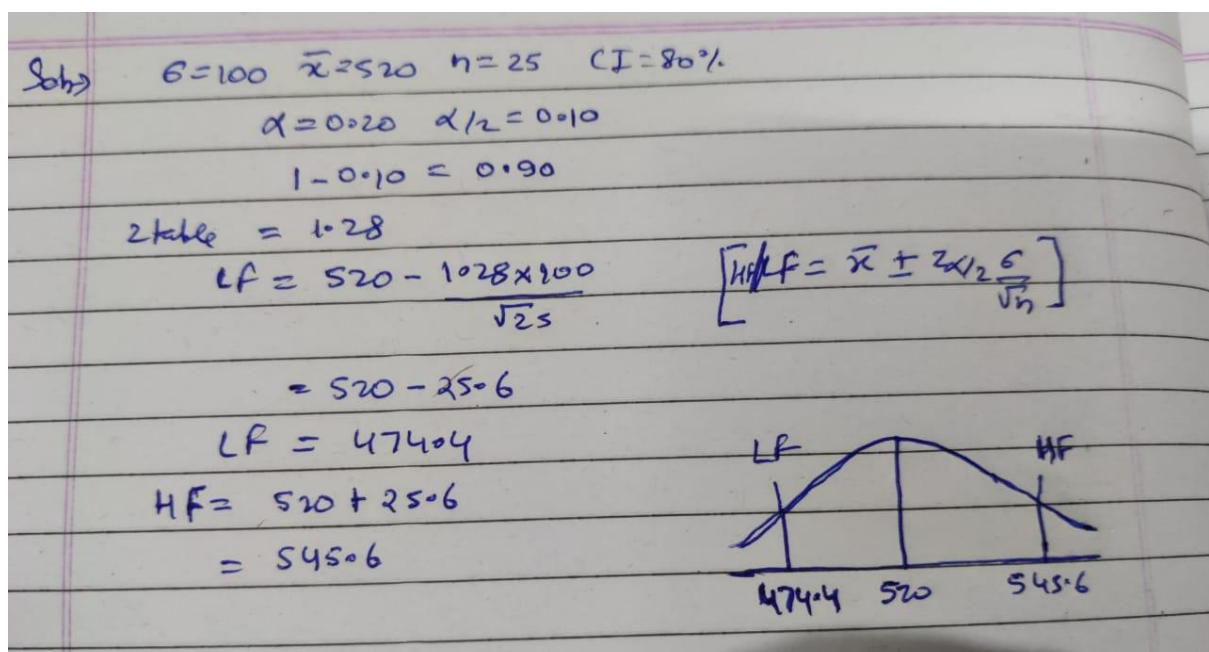


QUESTION 1: Plot a histogram,  
10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 88, 90, 92, 94, 99



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.

Soln → (1)  $H_0: \text{Vehicles} \leq 60\%$  [Null Hypothesis]  
 $H_1: \text{Vehicles} > 60\%$  [Alternate Hypothesis]

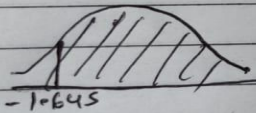
(2)  $n=250$  Significance value = 10%  $x=170$   
 $\therefore$  Confidence Interval = 90%  
 $\alpha = 10\% = 0.10$   $\alpha/2 = 0.05$   
 $\hat{p} = \frac{x}{n} = \frac{170}{250} = 0.68$   
 $q_0 = 1 - p_0 = 1 - 0.6 = 0.4$

(3)  $\alpha = 0.10$   
 z test with Proportion

$$\frac{\hat{p} - p_0}{\sqrt{\frac{p_0 q_0}{n}}} = \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}}$$

$$= \frac{0.08}{\sqrt{\frac{0.24}{250}}} \Rightarrow \frac{0.08}{0.03098} \Rightarrow 25.88$$

~~$\approx 25.88$~~



$25.88 > -1.645$   
~~Accept~~ Reject 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

Soln → [2,2,3,4,5,5,5,6,7,8,8,8,8,8,9,9,10,11,11,12]

$$\frac{99}{100} \times (n+1) \Rightarrow \frac{99}{100} \times 21 = 20.79 \text{ Index}$$

$\therefore$  99 percentile value is 12.

Que 5) In left & right-skewed data, what is the relationship between mean, median & mode?  
Draw the graph to represent the same.

Solution: In Right Skewed data  $\text{Mean} > \text{Median} > \text{Mode}$   
And In Left Skewed data  $\text{Mode} > \text{Median} > \text{Mean}$

