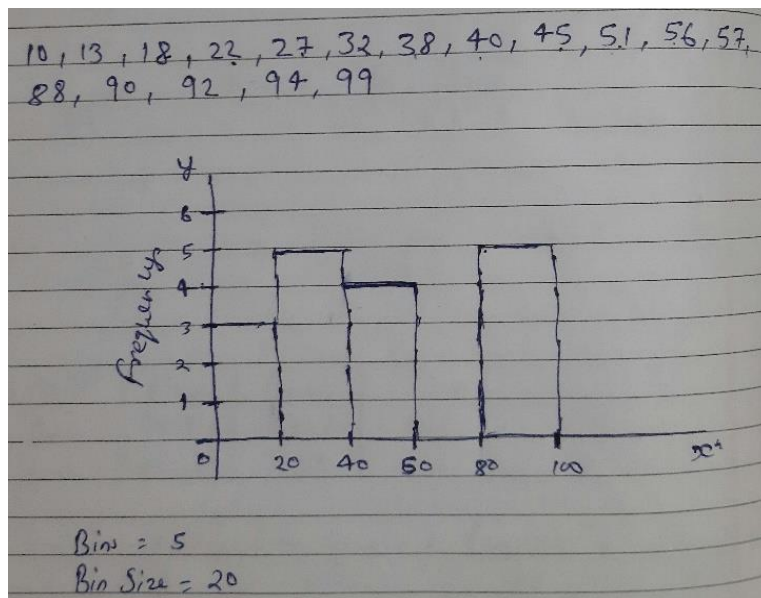


# FULL STACK DATA ANALYTICS

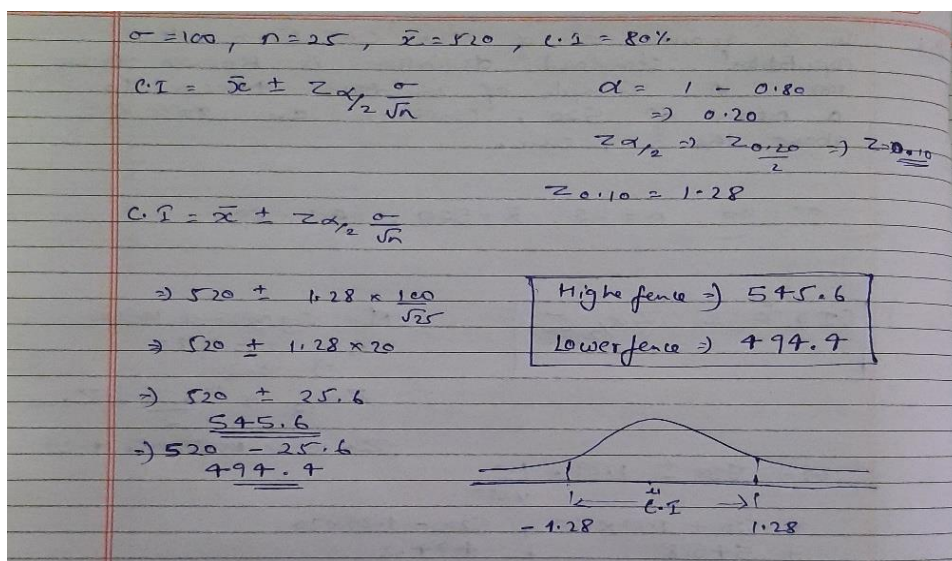
## STATISTICS ASSIGNMENT

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.

- 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.

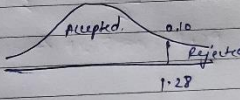
Ans

$H_0: P_0 \leq 60\%$        $n = 250$        $\alpha = 0.10$  (Significance level)  
 $H_1: P_0 > 60\%$        $x = 170$        $P_0 = 0.60$

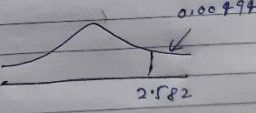
$\hat{p} = \frac{x}{n} = \frac{170}{250} = 0.68$   
 $q_0 = 1 - 0.60 = 0.40$

z-test with proportion      One-tailed test

$\frac{\hat{p} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.6 \times 0.4}{250}}} = 2.582$



P-value  $\Rightarrow 0.00494$   
 $1 - 0.99506$



P-value < Significance level

Conclusion:- Null Hypothesis Rejected.  
 therefore, there is not enough evidence to claim that the population proportion 'p' is greater than 0.60, at the  $\alpha = 0.10$  significance level.

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

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

Value =  $\frac{\text{Percentile} \times (n+1)}{100}$

$\Rightarrow \frac{99}{100} \times 21 = 20.79 = 21$

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

