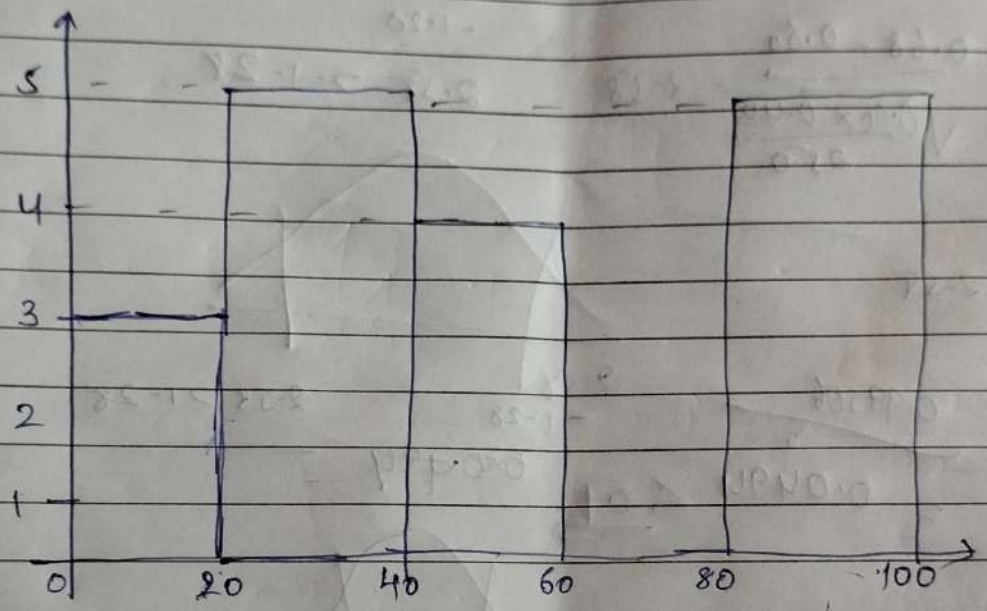
1) {10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 88, 90, 92, 94, 99}

Bins = 5 ; Bins-size = $\frac{100}{5}$ = 20



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

99 percentile = $\frac{99}{100} \times N$

= $\frac{99}{100} \times 20$ = 19.8 Index

So $\frac{11+12}{2}$ = 11.5.

3) 1) Null Hypothesis H_0 $P_0 \leq 0.60$ (60%)
Alternate Hypothesis, $P_0 > 0.60$ (60%)

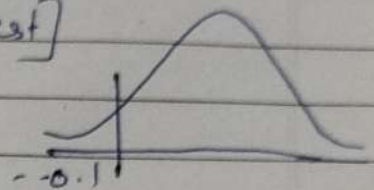
$n = 250$, $x = 170$
$\hat{p} = \frac{170}{250} = 0.68$

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

2) $\alpha = 0.1$

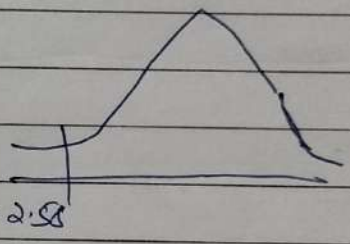
3) z-test with proportion [one-tail test]

$$z = \frac{\hat{p} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.60 \times 0.40}{250}}}$$



$z = 2.58$

4) P-Value:



Z-Value of 2.58
$= 0.99506$
Area of body $= 1 - 0.99506 = 0.00494$

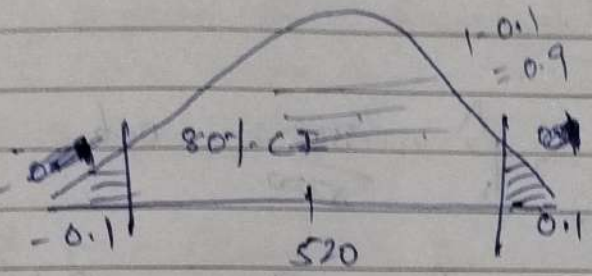
Since p-value $0.00494 < 0.1$ (α-Value). We reject the Null Hypothesis.

conclusion: There is no enough evidence to support Idea that vehicle owner in ABC city is 60% or less.

2) Question: In the quant test of CAT exam, the population standard deviation is known to be 100. A sample of 25 tests takers has a Mean of 520. Construct a 80% confidence Interval.

solution:

Given $\sigma = 100$, $n = 25$, $\bar{x} = 520$.



Here CI = 80% = 0.8
α = 1 - CI = 0.2

= Area under curve.
1 - 0.1 = 0.9

CI = point Estimate ± Margin of Error

$= \bar{x} \pm Z(\alpha/2) \frac{\sigma}{\sqrt{n}}$; $Z\left(\frac{0.2}{2}\right) = Z_{0.1}$ =

From z-table, value of $Z_{0.9} = 1.3$

Total Area = 1
Area under 0.1 = 1 - 0.1
= 0.9

$CI = 520 \pm 1.3 \times \frac{100}{\sqrt{25}}$

Lowerfence $= 520 - 1.3 \times \frac{100}{\sqrt{25}}$

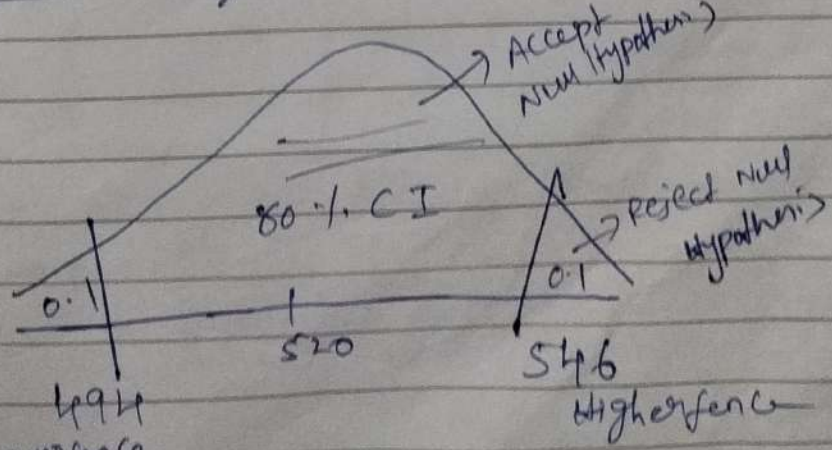
Lower fence = 520 - 26 = 494

Higherfence $= 520 + 1.3 \times \frac{100}{\sqrt{25}}$

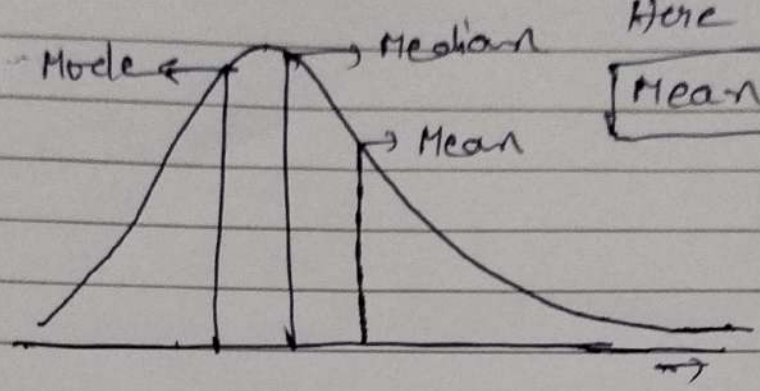
$= 520 + 26$

$= 546$

Confidence Interval graph:



5) 1) Right skewed distribution:

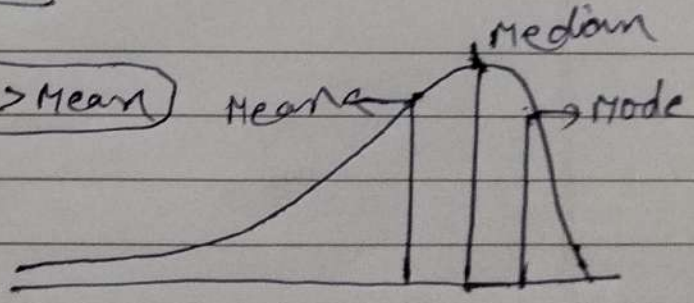


Here
Mean > Median > Mode

Considering people comments.
1) Maximum Number of people will write Medium length of comments. (Mean)
2) Less Number of people write More length of comments (Median)
3) Very less Number of people writing short Comments
↳ (Mode)

2) Left skewed distribution:

Here, Mode > Median > Mean



In Human life span,
1) Many people lives the Average Life
2) Few people lives very less life
3) Some have high life cycle as compared with ages.