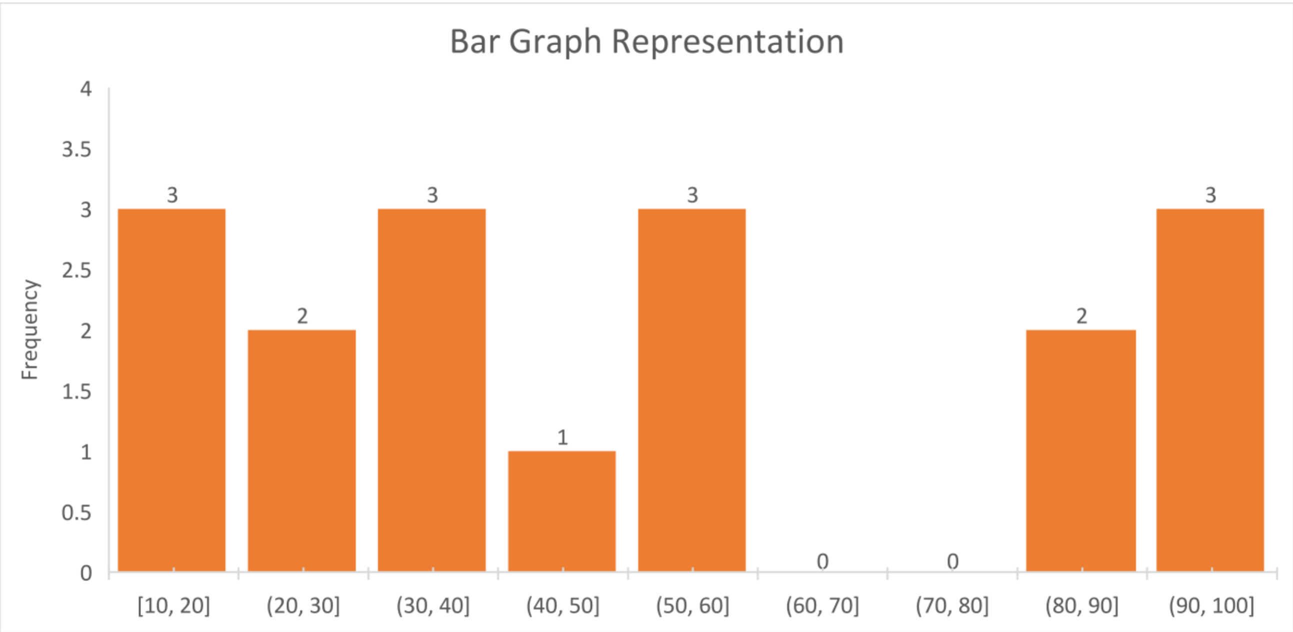
Sol^n 1:

Given Data Set = [10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 88, 90, 92, 94, 99]

Taking bin = 10

Bin size = (N/bin) = 99/10 ≈ 10



Sol^n 2:

$\sigma = 100$; $n = 25$; $\bar{x} = 520$; C.I = 80%

α = 1-C.I =1-0.8 =0.2

Since we have population standard deviation so we have to apply Z test here,

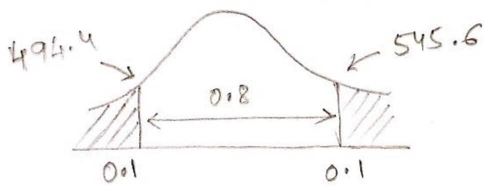
$Z_{\alpha/2} = -1.28$ (from the z table)

Now,

$$Z = \bar{x} \pm Z_{\frac{\alpha}{2}} \left[\frac{\sigma}{\sqrt{n}}\right]$$

$$= 520 \pm 1.28 \times \frac{100}{\sqrt{25}}$$

= 494.9 or 545.6



Lower fence = 494.9

Upper fence = 545.6

i.e., if the value lies between 494.9 to 545.6 then we accept the Null Hypothesis and beyond that we have to reject the Null Hypothesis and Accept the Alternate Hypothesis depending upon the one tail and two tail test.

Sol^n 3:

Given that:

n = 250 ; No. of responses (yes) = 170

since we have to check only one condition i.e. there is a disbelieve that it is more than 60% of citizen in the country ABC who own a vehicle.

a) Null Hypothesis (H_0) : μ ≤ 60 %

Alternate Hypothesis (H_1) : μ > 60 %

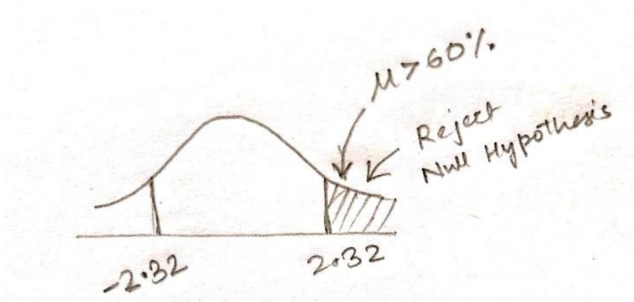
b) significance level = 10 %

α = 1-0.9 = 0.1

C.I = 90 %

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

$q_0 = 1 - P_0 = 1\text{-}0.6 = 0.4$



$$Z_{value} = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}}$$

$$= \frac{0.68-0.6}{\sqrt{\frac{0.6*0.4}{250}}} = 8.247$$

Z_{score} = -2.32 (*from z table*)

Since $Z_{value} > Z_{score}$, i.e. we have to reject the null hypothesis.

So, there are more than 60% of residents who owns a vehicle.

Sol^n 4:

Given data set = [2,2,3,4,5,5,5,6,7,8,8,8,8,8,9,9,10,11,11,12]

99 percentile = ?

Position of 99 percentile = $\frac{99}{100} * (n+1)$

$= \frac{99}{100} * 21$

= 20th position

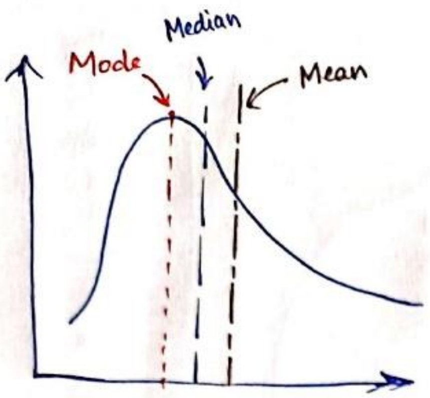
99 percentile of given data set is 12.

Sol^n 5:

1) In right skewed distribution,
   Mean > Median > Mode

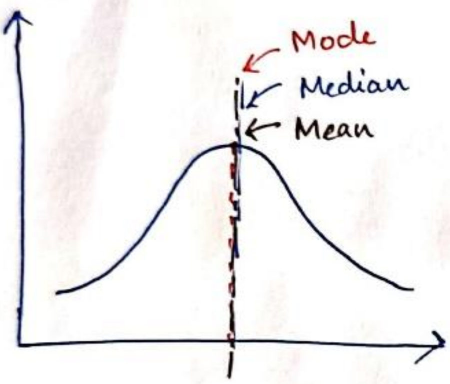
2) In left skewed distribution,
   Mean < Median < Mode

3) In Normal distribution
   Mean ≈ Median ≈ Mode



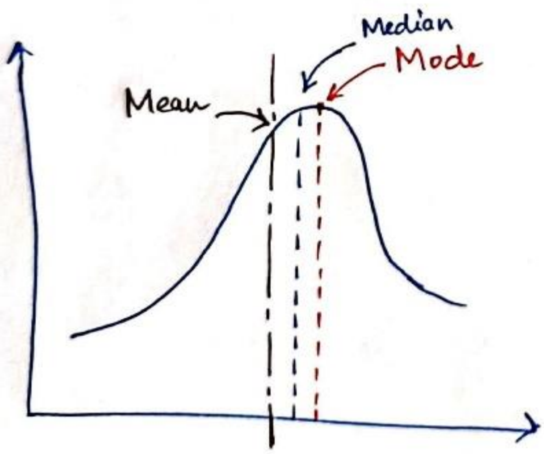
→ Right Skewed / Positive Skewed

$\mu >$ Median $>$ Mode



Normal Gaussian Distribution

$\mu \approx$ Median $\approx$ Mode



→ Left Skewed / Negative Skewed

$\mu <$ Median $<$ Mode