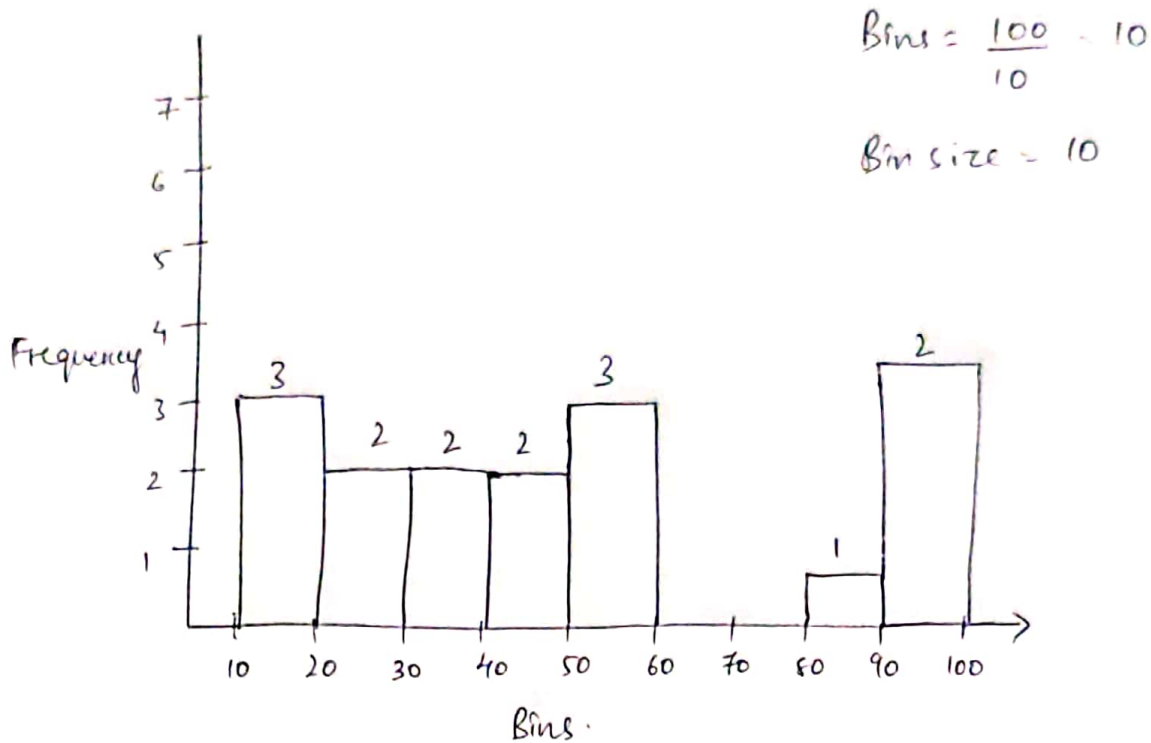


Question 1

Plot the histogram

10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 68, 90, 92, 94, 99



Question 4

99th percentile

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

$$\text{Formula} = \frac{p}{100} \times (n+1)$$

$$= \frac{99}{100} \times (21)$$

$$= 20.79 \approx 20^{\text{th}} \text{ Index}$$

In the above problem, the 20th index is 12 which is the 99th percentile

Question 2'

Formula

$$\bar{x} \pm z_{\text{score}} \left(\frac{\sigma}{\sqrt{n}} \right)$$

$$\bar{x} = 520$$

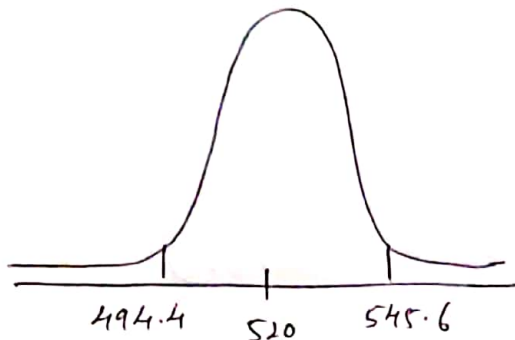
z_{score} for 80% confidence interval is 1.28

Standard deviation (σ) = 100

$$n = 25$$

$$(i) 520 + 1.28 \left(\frac{100}{\sqrt{25}} \right) = 545.6$$

$$(ii) 520 - 1.28 \left(\frac{100}{\sqrt{25}} \right) = 494.4$$



Confidence interval for 80% about the mean is (494.4, 545.6)

Question 3

Right Tailed Test

$$n = 250$$

$$x = 170$$

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

(i) Null Hypothesis

$$H_0: p_0 = 60\%$$

$$H_1: p_0 \neq 60\%$$

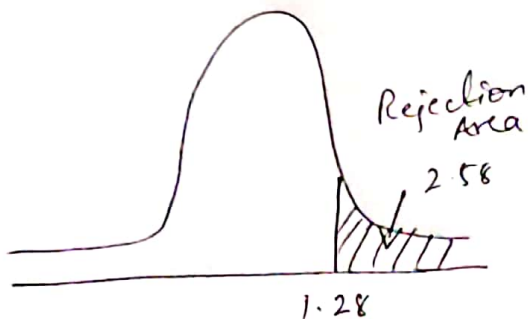
$$p_0 = 0.60$$

$$q_0 = 1 - 0.60 = 0.40$$

$$\alpha = 0.10 \quad 1 - \alpha = 1 - 0.10 = 0.90$$

Z-test with proportion

$$Z_{\text{test}} = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0 q_0}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.60 \times 0.40}{250}}} = 2.58$$

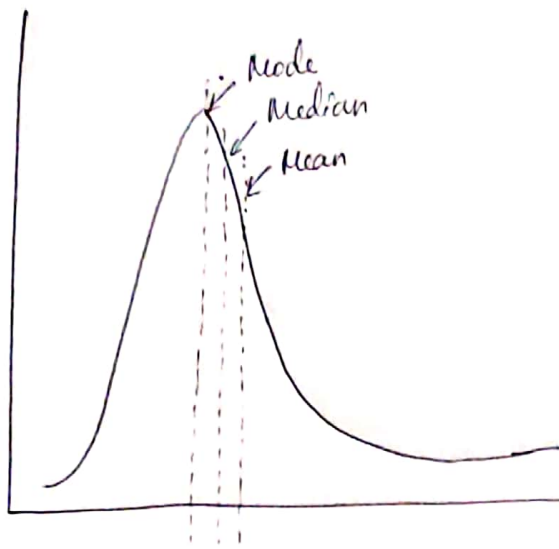


Since test statistic value of 2.58 is beyond the z-score value of 1.28 we reject the null hypothesis. Citizens owning a car in city ABC is less than 60%

Question 5:

- (i) Mean, Median, Mode for Right skewed data is that mean is always greater than median and the median is always greater than the mode

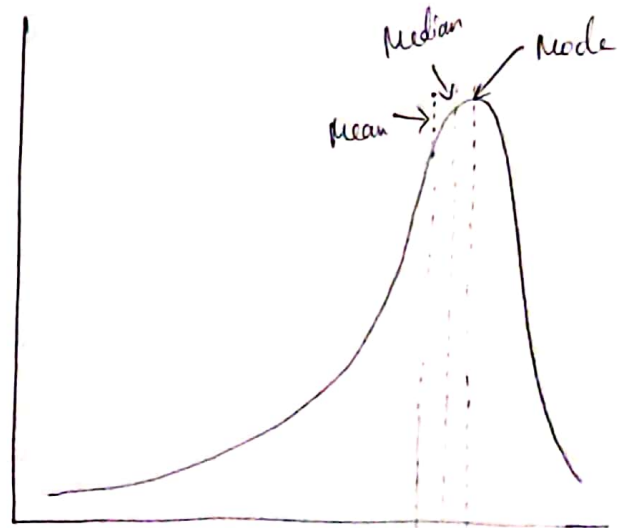
Formula:- $\text{Mean} > \text{Median} > \text{Mode}$



Positively/Right skewed frequency distribution

- (ii) Mean, Median, Mode for Left skewed data is that mean is always lesser than median and the median is always lesser than the mode

Formula:- $\text{Mean} < \text{Median} < \text{Mode}$



Negatively/Left skewed frequency distribution