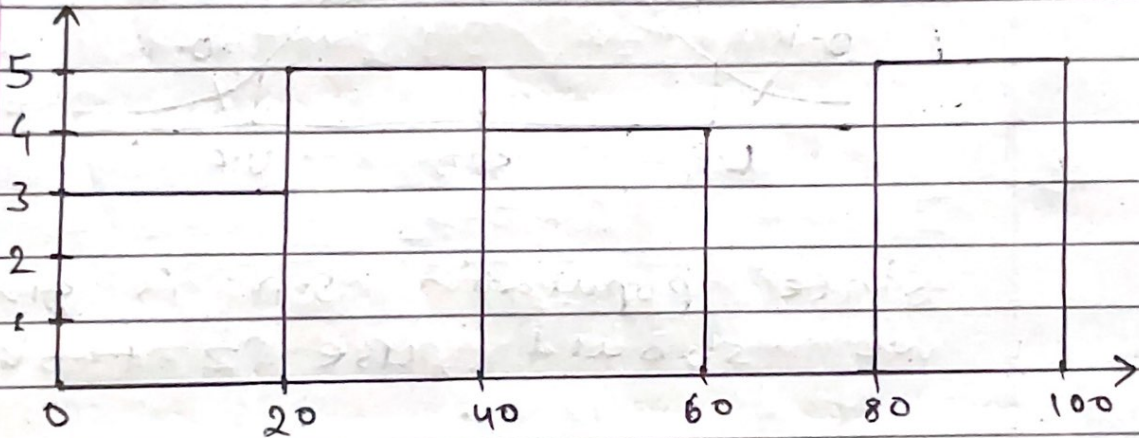


Statistics Assignment

1). Plot a histogram.

10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56
57, 88, 90, 92, 94, 99.

A). Suppose bins = 5, & bin size = 20.



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% C.I about the mean.

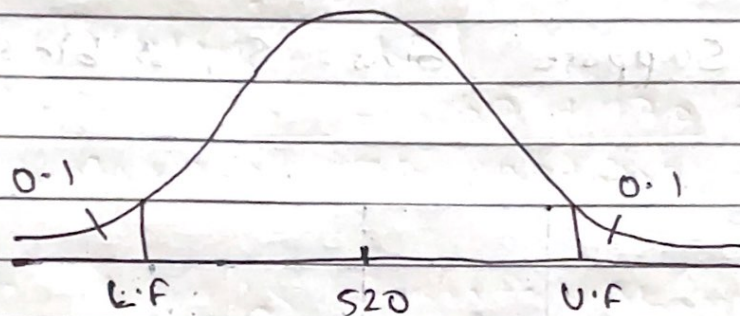
A1. Given, $\sigma = 100$, $n = 25$, $\bar{x} = 520$

$$C.I = 80\%$$

$$\alpha = 1 - C.I$$

$$= 1 - 80\%$$

$$= 0.2$$



Since population S.D is given, we should use z-table.

$$Z_{\frac{\alpha}{2}} = Z_{\frac{0.2}{2}} = Z_{0.1}$$

Using z-table,

$$Z_{\frac{\alpha}{2}} = 1.28$$

$$L.F = \bar{x} - Z_{\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}$$

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

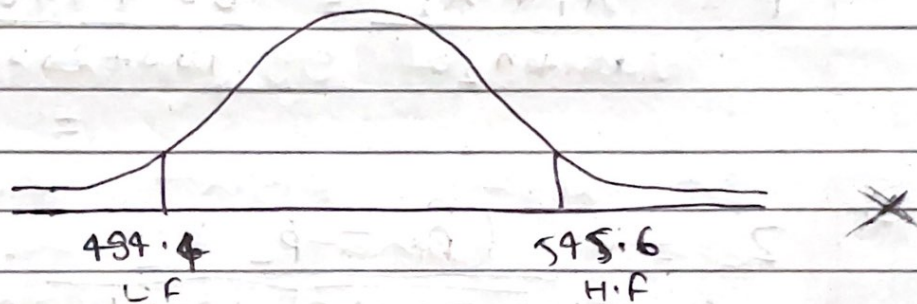
$$= 520 - 1.28 \times \frac{160}{8}$$

$$= 520 - 25.6$$

$$= 494.4$$

$$H.F = 520 + 25.6$$

$$= 545.6$$

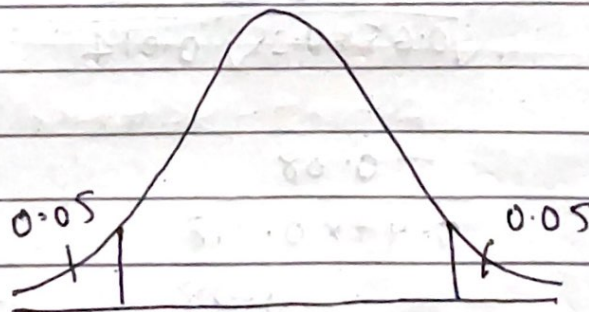


(3).

Null hypothesis $H_0 = P \leq 60\%$
 $P \leq 0.6$

Alternate hypothesis $H_1 = P \neq 0.6$

Given, $\alpha = 10\% = 0.1$



$$P_1 = 60\% = \frac{60}{100} = 0.6$$

$$P_2 = \frac{170}{250} = 0.68$$

$$\hat{p} = \frac{x_1 + x_2}{n_1 + n_2} = \frac{60 + 170}{100 + 250} = \frac{230}{350} = 0.65$$

$$Z = \frac{(\hat{p}_1 - \hat{p}_2)}{\sqrt{\hat{p}(1-\hat{p}) \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}}$$

$$= \frac{0.6 - 0.68}{\sqrt{0.65 \times (1 - 0.65) \left(\frac{1}{100} + \frac{1}{250} \right)}}$$

$$= \frac{-0.08}{\sqrt{0.65 \times 0.35 \times 0.014}}$$

$$= \frac{-0.08}{0.47 \times 0.118}$$

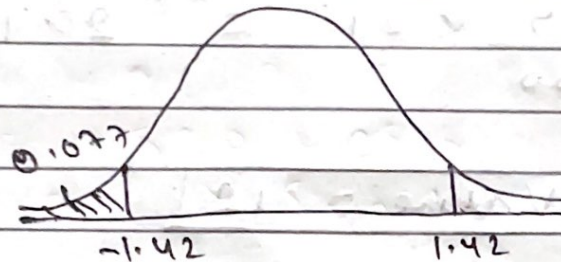
$$= \frac{-0.08}{0.055} = -1.42$$

$$= -1.42$$

$$= -1.42$$

Using Z score table:

p for $z = -1.42$ is 0.07780



Since, $p > \alpha$, $\{0.077 > 0.05\}$, we
Accept the null hypothesis.

Conclusion :- There is not sufficient evidence to support the idea the vehicle owner in ABC city is not 60% or less. (failed to Reject the null hypothesis).

④ what is the value of 99 percentile?

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

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

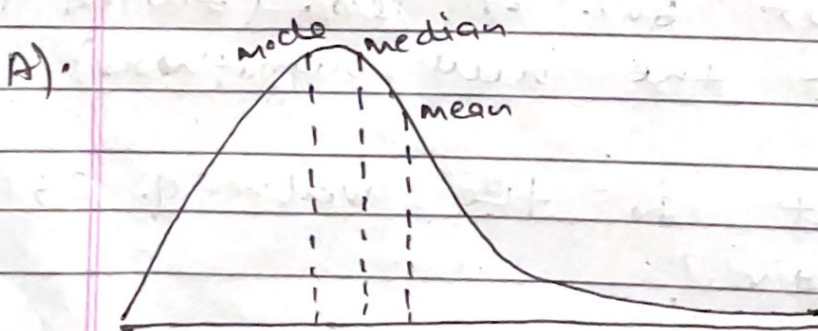
$$= \frac{99}{100} \times (20+1)$$

$$= \frac{99}{100} \times 21 = 20.79^{\text{th}} \text{ Index}$$

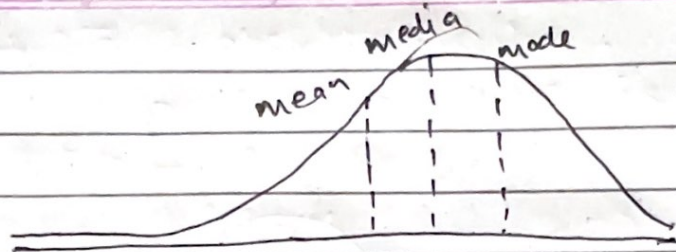
$$\therefore \boxed{\text{Value} = 12}$$

\therefore Value of 99 percentile is 12 A.

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



Right-skewed Distribution



Left - Skewed data.

Relationship —

In Right - Skewed data the mean will be greater than the median & median will be greater than mode.

$\therefore \text{mean} > \text{median} > \text{mode}.$

Eg: Wealth distribution.

In left - Skewed data the mode will be greater than median & median will be greater than mean.

$\therefore \text{mode} > \text{median} > \text{mean}.$

Eg: Life span of human being.