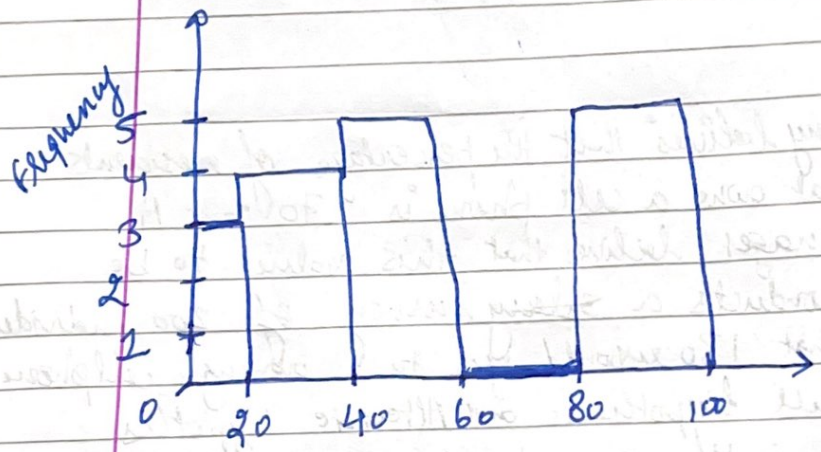
Stats Assignment - 1

Q1 10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 88, 90, 99.

Bin size $= \frac{100}{5} = 20$



Q2

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

CI = 80%.

$\alpha = 1 - 0.80$

$= 0.20$

CI about mean 80% $= \bar{x} \pm Z_{\alpha/2}\left(\frac{\sigma}{\sqrt{n}}\right)$

Lower fence $= 520 - Z_{0.10}\left(\frac{100}{\sqrt{25}}\right)$

$= 520 - .5398\left(\frac{100}{5}\right)$

$= 520 - 10.796$

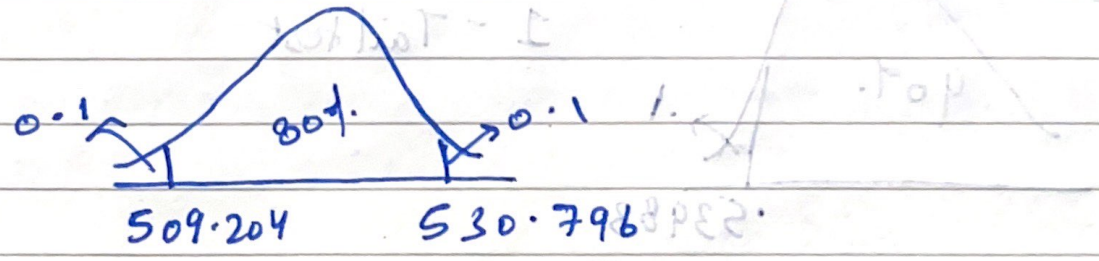
$= 509.204$

Higher fence = $\bar{x} + z_{0.10}\left(\frac{\sigma}{\sqrt{n}}\right)$

$= 520 + 10.796$

$= 530.796$

$\therefore$ CI is b/w 509.204 & 530.796

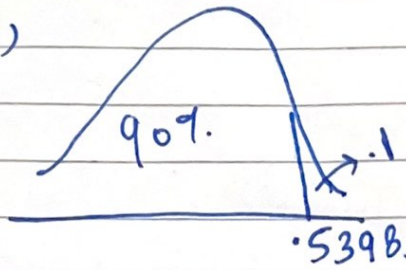


(3) Given: $n = 250$, $x = 170$, $\alpha = 0.10$

(a) $H_0: P_0 \leq 60\%$

$H_1: P_0 > 60\%$

(b)



1 - Tail test

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

$P_0 = 0.60$

$q_0 = 1 - 0.60 = 0.40$

$$Z\text{-test} = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.6}{\sqrt{\frac{.6 \times .4}{250}}} = \frac{0.08}{\sqrt{\frac{.24}{250}}}$$

$$= \frac{.08}{\sqrt{.00096}} = \frac{.08}{.03} = \underline{2.6}$$

$\therefore$ $2.6 > .5398$

$\therefore$ Reject the null hypothesis

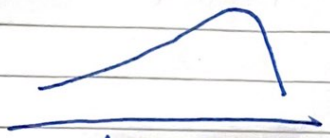
$\Rightarrow$ Car owners are more than 60%

DATE
PAGE

(4) Value Index = $\frac{99}{100} \times 20 = 19.8^{th}$ index

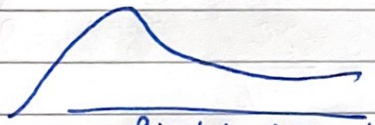
$\therefore$ 12 is at 99%.

(5) If the distribution of data is skewed to left, the mean is less than the median.



left skewed

If the distribution is skewed to the right the mode is often less than the median. Median is less than the mean



Right skewed