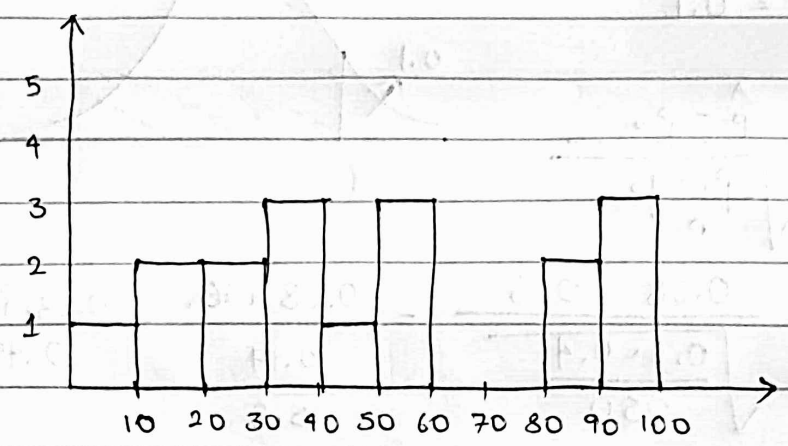
Statistics Assignment

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

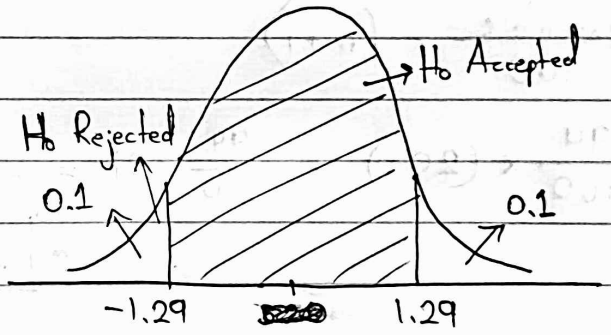
No. of groups = 10

Bin size = $\frac{100}{10} = 10$



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

C.I = 80% $\alpha = 1 - 80\% = 0.2$



$1 - 0.1 = 0.9$

$Z_{0.9} = 1.29$

Point estimate ± Margin of error

$$\bar{x} \pm Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$$

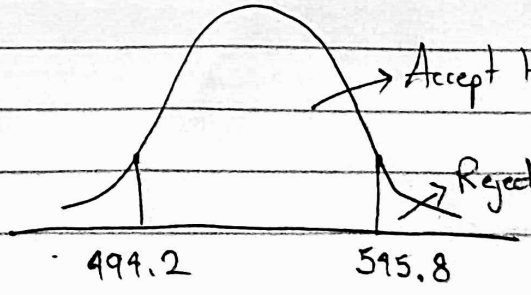
Lower Fence $= \bar{x} - Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$

$= 520 - 1.29 \frac{100}{\sqrt{25}} = 520 - (1.29 \times 20) = 520 - 25.8$

$= 494.2$

Higher Fence $= \bar{x} + Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$

$= 520 + 25.8 = 545.8$

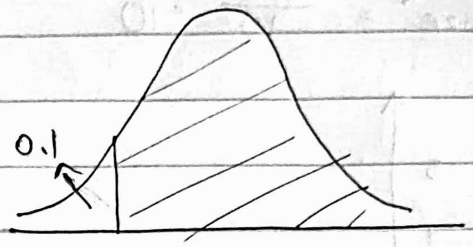


3. $H_0 \Rightarrow p_0 <= 60\%$ $\quad n = 250 \quad x = 170$

$H_1 \Rightarrow p_0 > 60\%$ $\quad \hat{p} = \frac{x}{n} = \frac{170}{250} = 0.68$

$q_0 = 40\% = 0.4$

$\alpha = 10\% = 0.1$



$$\text{Test Statistic} = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0 \times q_0}{n}}}$$

$$= \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}} = \frac{0.08 \times 10}{0.49} = \frac{0.08 \times 15.8}{0.49} = 2.57$$

$\frac{0.49}{15.8}$

As, $2.57 > 0.1$, H_0 is accepted.

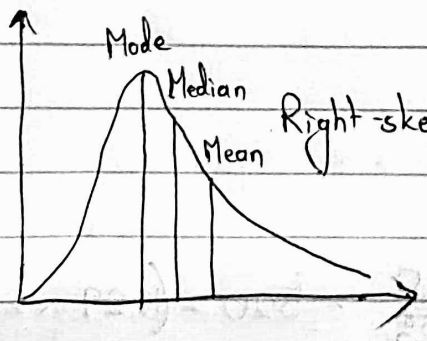
∴ Vehicle owner in ABC city is 60% or less.

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

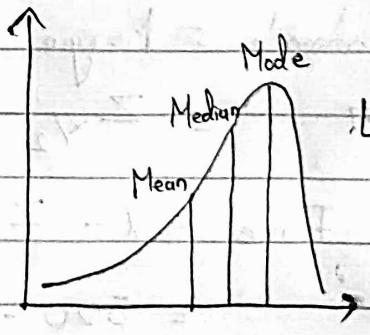
$$= \frac{99}{100} \times (20+1) = \frac{99}{100} \times 21 = 20.8^{th} \text{ Index}$$

$$= \boxed{12}$$

5.



Right-skewed



Left-skewed

Mean < Median < Mode

Mean > Median > Mode