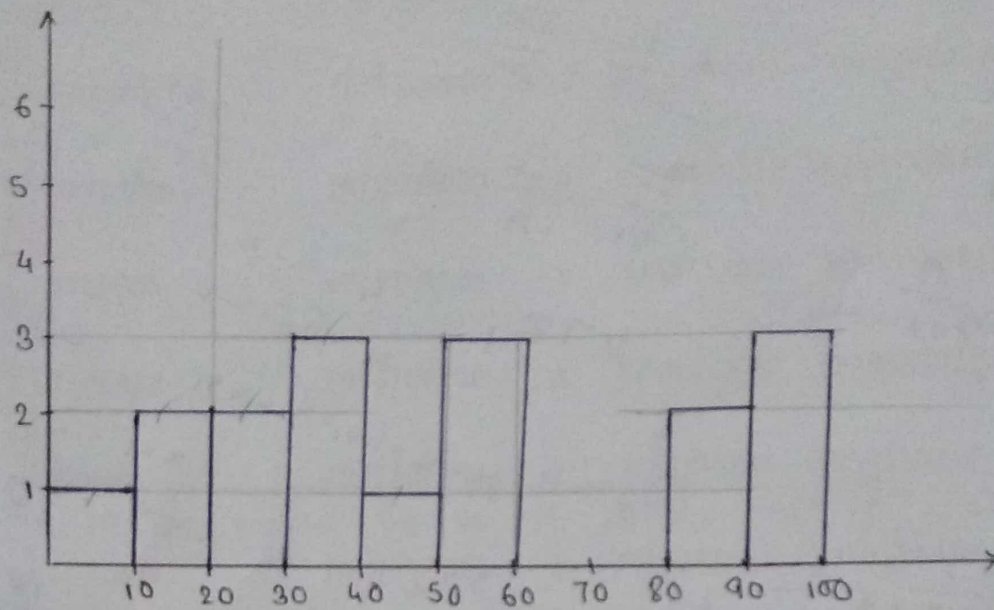1. 10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 88, 90, 92, 94, 99

2. Population standard deviation, $\sigma = 100$

Sample no, $n = 25$

Mean, $\bar{x} = 520$

$CI = 80\%$

$\therefore \alpha = 1 - 0.8 = 0.2$ $\therefore \alpha/2 = 0.1$

$\therefore Z_{0.1} = -1.28$

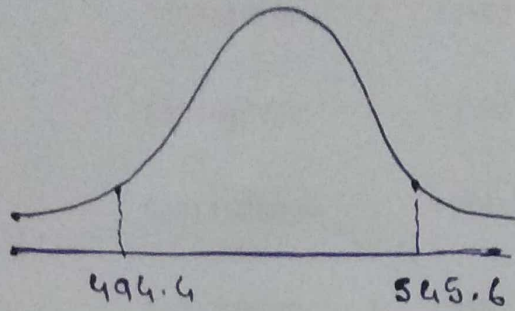$\therefore$ Lower fence $= \bar{x} - Z_{\alpha/2} \sigma/\sqrt{n}$

$$= 520 - \frac{1.28 \times 100}{\sqrt{25}} = 494.4$$

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

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

$$= 545.6$$

80% CI about mean.

494.4   545.6

3. Company beleives that percentage of citizens owns vehicle is 60% or less

a) **Null hypothesis** - $H_0 : P_0 \leq 60\%$

$H_1 : \cancel{\text{Provel}} P_0 > 60\%$

$\therefore q_0 = 1 - P_0 = 1 - 0.6 = 0.4$
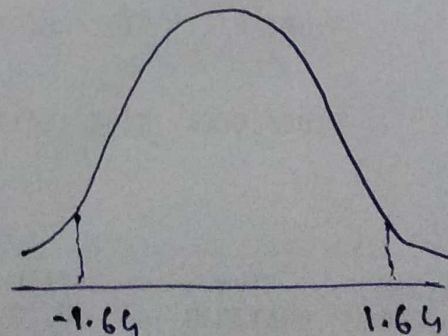
Total survey number, $n = 250$

Responded, $x = 170$

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

For 10% significance level,

$\cancel{\text{Provel}} \alpha = 0.1$

For 2 tail, $\alpha/2 = 0.05$

$\therefore Z_{0.05} = -1.64$

-1.64   1.64

$\therefore$ Z-test value $= \dfrac{\hat{p} - P_0}{\sqrt{\dfrac{P_0 q_0}{n}}}$

$= \dfrac{0.68 - 0.60}{\sqrt{\dfrac{0.6 \times 0.4}{250}}} = 2.58$

Since $2.58 > 1.64$, we will reject the null hypothesis

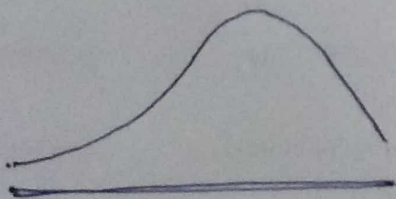4. $2, 2, 3, 4, 5, 5, 5, 6, 7, 8, 8, 8, 8, 8, 9, 9, 10, 11, 11, 12$

99 percentile

$\therefore$ Value $= \dfrac{99}{100} \times 20 = 19.8$
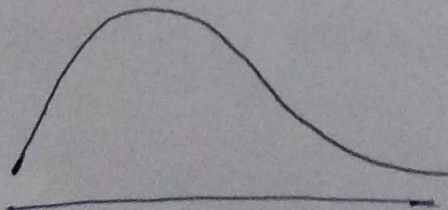
$\therefore$ 19.8th index means 11

$\therefore$ Value for 99 th percentile $= 11$

5. Left Skewed Data

$\Rightarrow$ Median < Mean < Mode

Right Skewed Data

$\Rightarrow$ Mode < Mean < Median