# Assignment - 3

=> A car company belines that the percentage of residents in city ABC that owns a vehicle is 60% or less. A sales manager disagrees with this. He conducts a hypothesis testing Surving 250 residents and found that 170 responded yes to owing a vehicle.

(a) State the null & Alternate Hypothesis.
(b) At 10% Significance level, is there enough evidence to support the idea that vehicle ownership in company ABC is 60% or less?

Solution :- given that $n = 250$

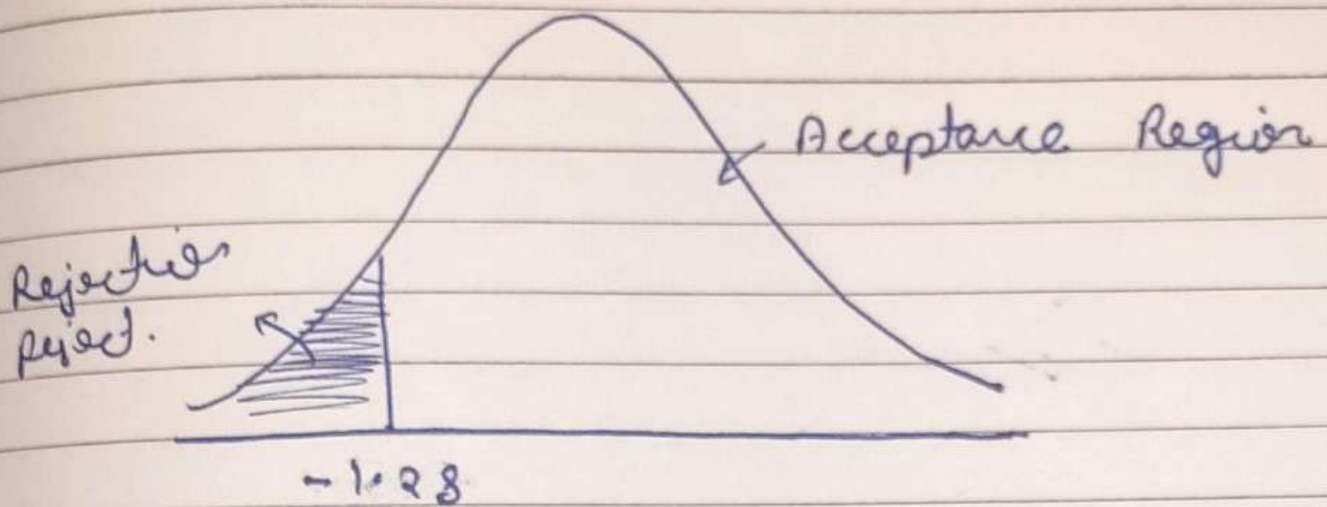$$x = 170$$

Null Hypothesis :-

$$H_0 : P_0 = 60\%$$
$$H_1 : P_0 \neq 60\%$$

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

$$P_0 = 0.6 \qquad q_0 = 1 - P_0 = 1 - 0.6 = 0.4$$

Significance value $\alpha = \cancel{\text{a-0}} \ 0.10$    $C.I = 90\%$



Acceptance Region

Rejection
pried.

$-1.28$

Since here $n \geq 30$, So, we apply
Z- test

Now, z- test with proportion

$$Z = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}}$$

$$= \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}} = \frac{0.08}{\sqrt{0.00096}}$$

$$= 2.58$$

$$Z = 2.58 \ > -1.28$$

Since the z-value is greater than Signific.
value. So we accept the null hypothesis
that the vehicle Ownership in Compay ABC
is 60% is less.