iNeuron

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ASSIGNMENT – STATISTICS

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Assignment - 3

=> A car company belives 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 Surveying 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 $n = 250$
$x = 170$

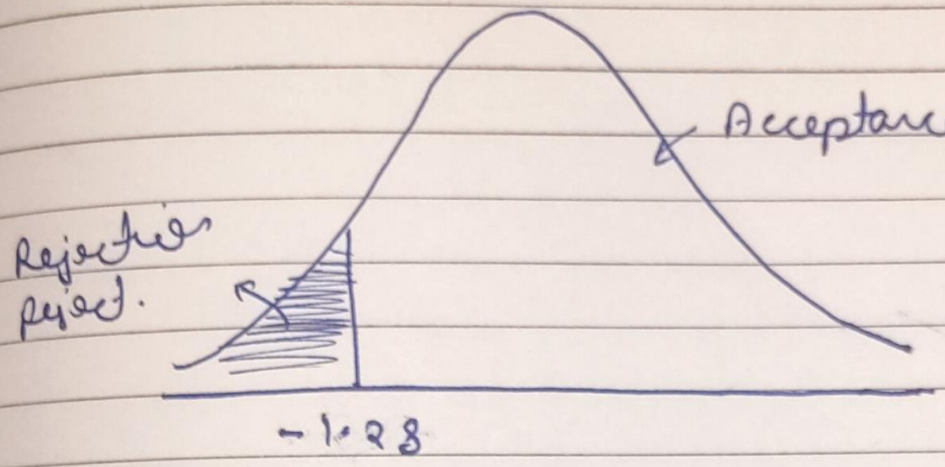
Null Hypothesis :-

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

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

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

Significance value $\alpha = 0.10$ C.I = 90%



Since here $n > 30$, 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 Significance Value. So we accept the null hypothesis that the vehicle ownership in company ABC is 60% is less.