Saathi

Date __/__/____

Problem Statement –

A car company believes that 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 owning a vehicle

a) State the null and alternate hypothesis.

b) At 10% significance level, is there enough evidence to support the idea that vehicle ownership in city ABC is 60% or less.

Solution:-(a) $H_0 \Rightarrow p \leq 0.60$

$H_1 \Rightarrow p > 0.60$

(b) C.I = 90%

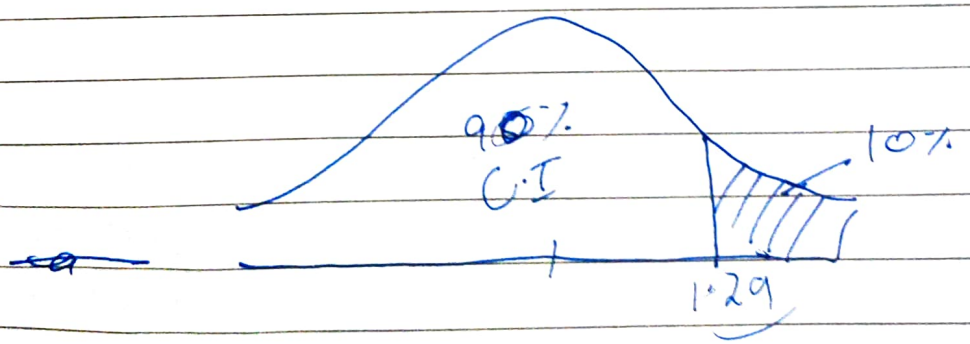
$\alpha = 0.1$

$n = 250$

$\hat{p} = 0.68$

$p = 0.60$

$q_0 = 0.40$



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★ Decision rule

$Z_{0.9} \Rightarrow 1.29$

If $Z_0 \leq 1.29$ (Accept null hypothesis

Else reject ~~null~~ H_0 & accept H_1

$$Z_0 = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0 \times q_0}{n}}}$$

$$= \frac{0.68 - 0.60}{\sqrt{\frac{0.60 \times 0.40}{250}}}$$

$$= \frac{0.08}{0.0195959} = 0.4082$$

★ Conclusion:-

As $0.4082 < 1.29$.

we accept the null hypothesis and reject alternate hypothesis. Therefore, ~~city ABC~~ residents of city ABC buys car 60% or less.