Assignment-5

Q) A car company believes that the percentage of citizens in city ABC that owns vehicle is 60% or less. A sales Manager disagrees with this. He conducted a hypothesis testing surveying 250 residents & found that 170 residents responded yes to owing a vehicle

a) state null and alternate hypothesis?

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

Sol)

Null Hypothesis $H_0 : P_0 \leq 60\%$

Alternate Hypothesis $H_1 = P_0 > 60\%$

$n = 250$

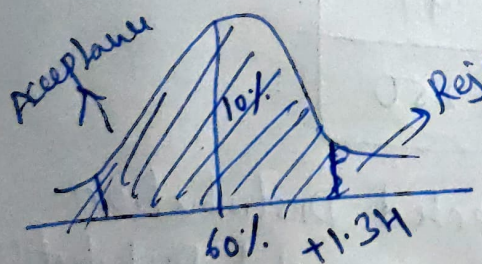
$x = 170$

$SI = 10\%$

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

$q_0 = 1 - P_0 = 1 - 0.6 = 0.4 (40\%)$

$\alpha = 1 - SI = 1 - 0.1 = 0.9$



$$z\text{-test} = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}}$$

$$= \frac{0.68 - 0.6}{\sqrt{\frac{(0.6)(0.4)}{250}}}$$

$$= \frac{0.08}{\sqrt{\frac{0.24}{250}}}$$

$$= \frac{0.08}{0.030}$$

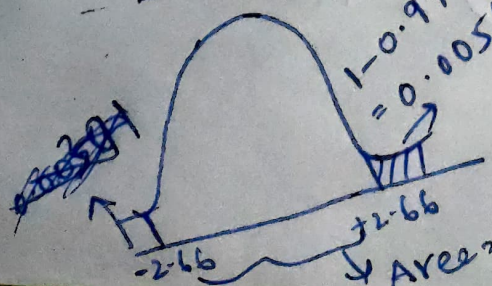
$$= 2.66$$

Using z-table,

$2.66 > 1.34$ { Reject Null Hypothesis }.

{ Another method }.

Using P-Value



P-value $= 0.0056 < 0.9$

{ Reject }