FULL STACK DATA ANALYTICS

ASSIGNMENT

④ A Car company believes 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 owning 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 city ABC is 60% or less?

Ans

$H_0 : P_0 \leq 60\%$ $\quad n = 250$ $\quad \alpha = 0.10$

$H_1 : P_0 > 60\%$ $\quad x = 170$ $\quad P_0 = 0.60$

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

$$q_0 = 1 - .60 \Rightarrow 0.40$$

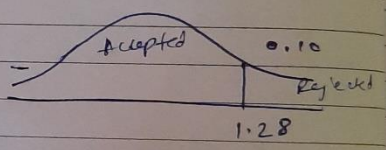
one - tailed test

Z- test with proportion

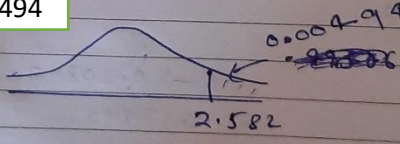
$$\frac{\hat{p} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} \Rightarrow \frac{0.68 - 0.60}{\sqrt{\frac{0.6 \times 0.4}{250}}}$$

$$\Rightarrow 2.582$$

REJECTED THE NULL HYPOTHESIS



P-value $\Rightarrow$ 0.00494



P-VALUE IS LESS THEN $\alpha = 0.10$, THAT MEAN REJECTED THE NULL HYPOTHESIS

$$1 - 0.99506 = 0.00494$$

P-value < Significance level

Conclusion: Null Hypothesis is Rejected.

Therefore, there is not enough evidence to claim that the Population proportion 'p' is greater than 0.60, at the $\alpha = 0.10$ significance level.