

Assignment

① 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%.

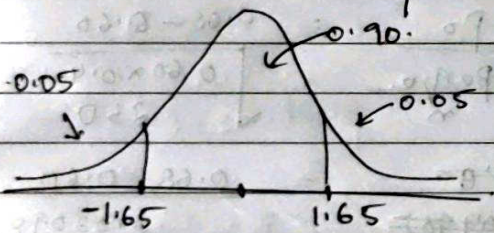
$$\begin{aligned} H_0 &: p_0 = 60\% \\ H_1 &: p_0 \neq 60\% \end{aligned}$$

$$n = 250, \quad x = 170$$

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

$$q_0 = 1 - p_0 = 1 - 0.60 = 0.40$$

$$\alpha = 0.10, \quad C.I. = 90\% = 0.90$$



$$Z\text{-test} = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0 q_0}{n}}}$$

$$= \frac{0.68 - 0.60}{\sqrt{\frac{0.60 \times 0.40}{250}}} = \frac{0.08}{0.03098} = 2.58$$

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$$Z\text{-test} = 2.58$$

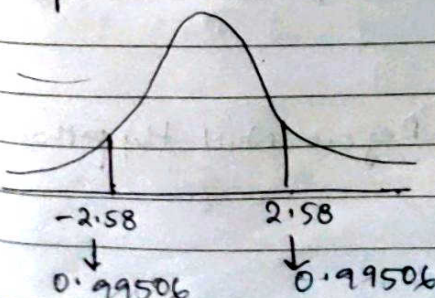
$$2.58 > 1.65$$

Reject Null hypothesis.

p-value

$$1 - 0.99506 = 0.00494$$

$$p\text{-value} = 0.00494 + 0.00494 = 0.0098$$



$$p\text{-value} < \alpha$$

$$0.0098 < 0.10$$

→ Reject Null Hypothesis