

### Day 8 Stats

A car believes that the percentage of citizen in city ABC that owns a vehicle is 60% or less. A Sales Manager disagree with this. He conducted a hypothesis testing surveying 250 residents & found that 170 residents responds yes to owning a vehicle.

a) State the null & alternate hypothesis.

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

Ans:-

GIVEN:

$$n = 250$$

$$x = 170$$

STEP 1:

$$H_0: P_0 = 60\%$$

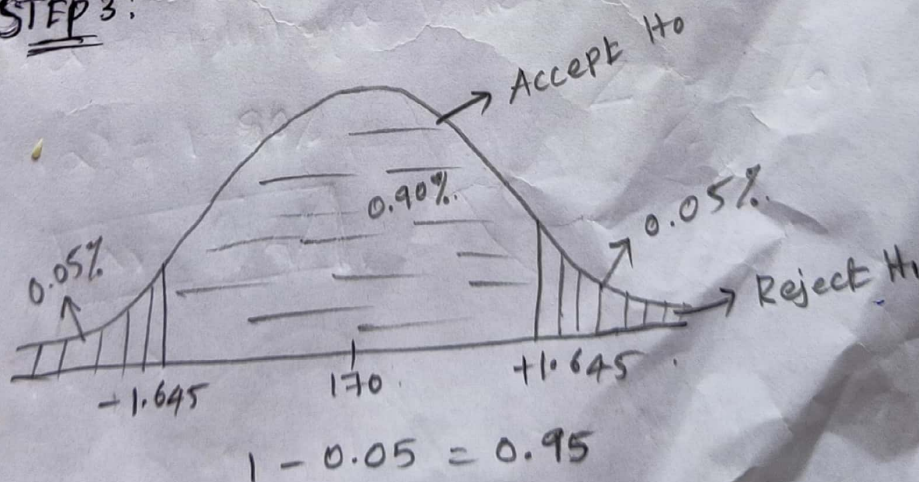
$$H_1: P_0 \neq 60\%$$

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

STEP 2:

$$C.I = 90\% \quad \alpha = 1 - 0.90 = 0.1$$

STEP 3:





STEP 4:

Z-test with Proportion

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

$$q_0 = 1 - p_0 \\ = 1 - 0.6$$

$$q_0 = 0.4$$

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

$$= \frac{0.08}{\frac{0.48}{15.81}}$$

$$= \frac{0.08}{0.03} = 2.66$$

CONCLUSION

$$2.66 > 1.645$$

Reject the Null Hypothesis.