

Q3. A car believes that the percentage of citizens in city ABC that own a 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 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.

Hull Hypothesis

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

$$H_1: P_0 > 60\%$$

$$n = 250$$

$$\bar{n} = 170$$

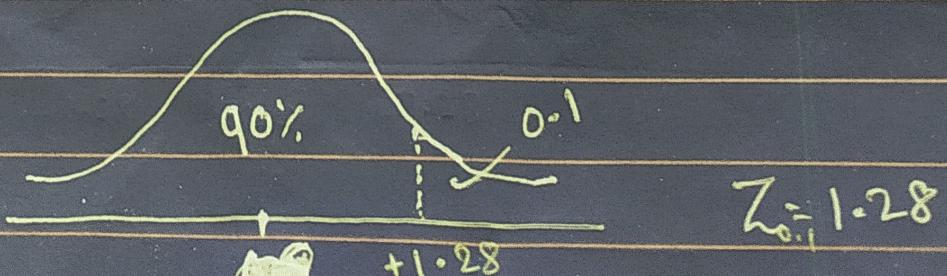
~~$P = \frac{\bar{n}}{n}$~~

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

$$q_0 = 1 - P_0 = 1 - 0.6 = 0.4$$

$$\alpha = 0.1$$

~~$1 - 0.1 = 0.9$~~

 ~~$Z_{\alpha/2}$~~


$$Z_{\text{test}} = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0(1-P_0)}{n}}} = \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}} = \frac{0.08}{\sqrt{\frac{0.24}{250}}} \\ = \frac{0.08}{\sqrt{0.00096}} = \frac{0.08}{0.0309} \approx 2.666$$

$2.666 > 1.28$ [Reject the Null Hypothesis]

