9-7-2021

A car company believes that the % 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 & found that 170 responded YES to owning a vehicle.

a) State Null & Alternate Hypothesis

b) At 10% significance value, is there enough evidence to support the idea that vehicle ownership in city ABC is 60% or less?

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

$H_1 : P_0 > 60\%$

b) Given: $n = 250$; $x = 170$

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

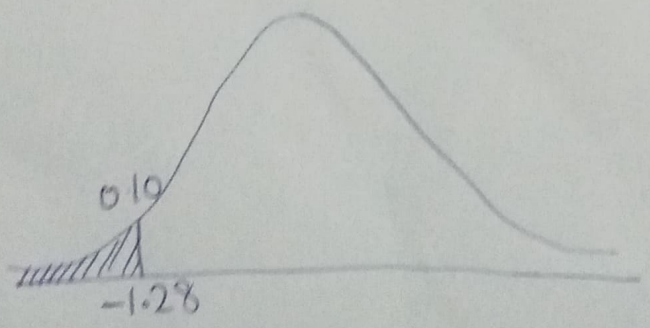
$$p_0 = 0.60$$

$$q_0 = 1 - p_0 = 1 - 0.60 = 0.4$$

$$\hat{p} = 0.68$$

Step 2:- $\alpha = 0.10$

$$CI = 1 - 0.10 = 90\%$$



This is a one-tailed test.

Z TEST WITH PROPORTION $= \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{(0.6)(0.4)}{250}}}$

$= 2.58$

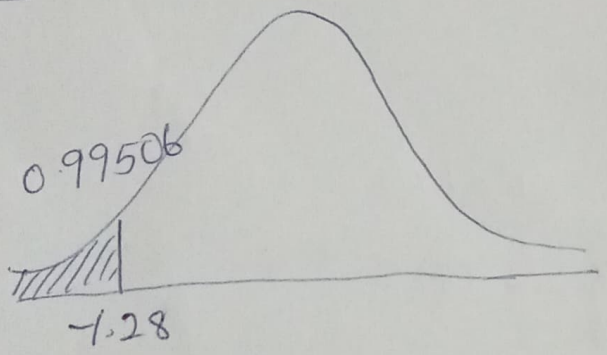
$2.58 > -1.28$

Reject Null Hypothesis

Conclusion:

Vehicle Ownership in city is not less than 60%.

P-Value:



1- Area under curve = $1 - 0.99506 = 0.0494$

P Value = 0.0494

$2.58 > 0.0494$

Reject Null Hypothesis.