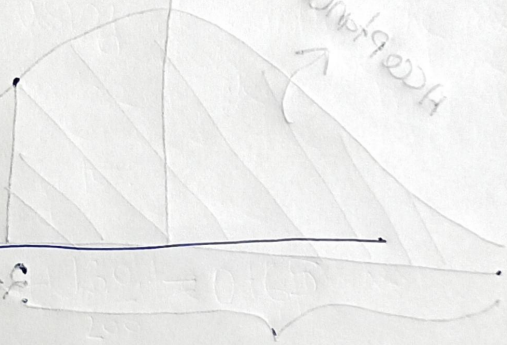
✱ Question

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?



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

H_1 : $P_0 > 60\%$

(b) $n = 250$

$x = 170$

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

$P_0 = 0.60$

$q_0 = 1 - 0.60 = 0.40$

$\alpha = 0.10$ and $CI = 90\%$

This is one tail test. Most specifically right tail test.

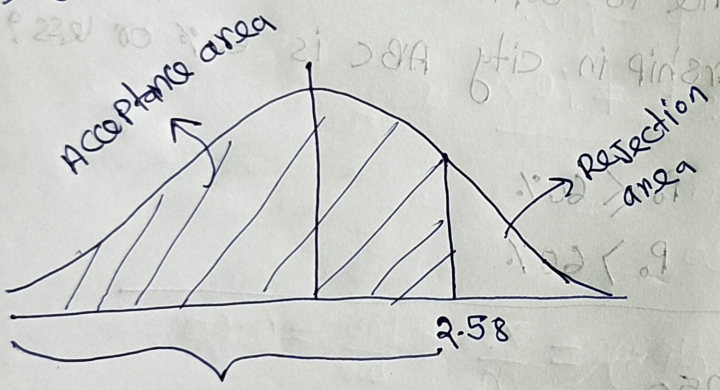
$$z\text{ value} = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}}$$

$$= \frac{0.68 - 0.60}{\sqrt{\frac{0.60 * 0.40}{250}}}$$

$$= 2.58$$

- Look up 2.58 in the z-table

$\Rightarrow 0.99506$



$$p\text{-value} = 1 - 0.99506$$

$$= 0.00494$$

$\alpha = 0.10$

As p-value $< \alpha$ so we rejected the NULL Hypothesis

So, the idea of car ownership 60% or less got rejected.