Assignment 3

Q1 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?

Ans:- $n = 250$, $x = 170$, $\alpha = 0.1$, $P_0 = 60$

Step 1 a) NULL Hypothesis $H_0 = P_0 \leq 60$

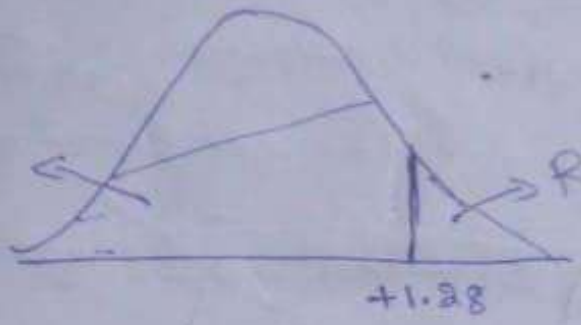
b) Alternate Hypothesis $H_1 = P_0 > 60$

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

$q = 1 - p_0 = 1 - 0.60 = 0.40$

step2: $\alpha = 0.1$, CI: 90%

step3. Decision Boundary.



step4:- 2 test with proportion:-

$$z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0 q_0}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.6 \times 0.4}{250}}} = \frac{0.08}{0.489} \times 15.811$$

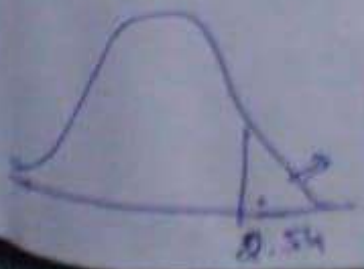
$$= \frac{1.264}{0.489} = 2.58.$$

Conclusion:.

$2.58 > 1.28$ So we Reject the NULL hypothesis

step5: Conclusion:. The Percentage of Citizens in City ABC That owns a vehicle is more than 60%

Using Pvalue:-



p. val: 0.89773, α: 0.99506

P. value < Significance value

$0.89773 < 0.99506$

we reject the NULL Hypothesis