

Day - 6

Stats

Question: A car Company believes that the %age of residents in city ABC that owns a vehicle is 60% or less. A Sale manager disagree with this. He conducts a hypothesis testing surveying 250 residents and found that 170 responded yes to owning a vehicle.

a] State the  $H_0$  &  $H_1$

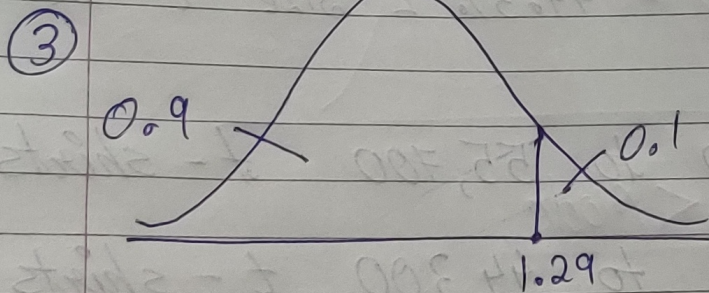
b] At 10% Significance level, is there enough evidence to support the idea that vehicle ownership in city ABC is 60% or less?

$$\Rightarrow \textcircled{1} H_0 \Rightarrow p_0 \leq 60\% = 0.6$$

$$H_1 \Rightarrow p_0 > 60\%$$

$$\textcircled{2} \alpha = 0.1$$

1-tail test.



$$\textcircled{4} \quad \underline{\text{z-test}} \quad z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0 q_0}{n}}} = \frac{0.68 - 0.6}{\sqrt{\frac{(0.6)(0.4)}{250}}} = \frac{0.08}{0.03098} = 2.58$$
$$\hat{p} = \frac{170}{250} = 0.68$$



⑤  $2.58 > 1.29$

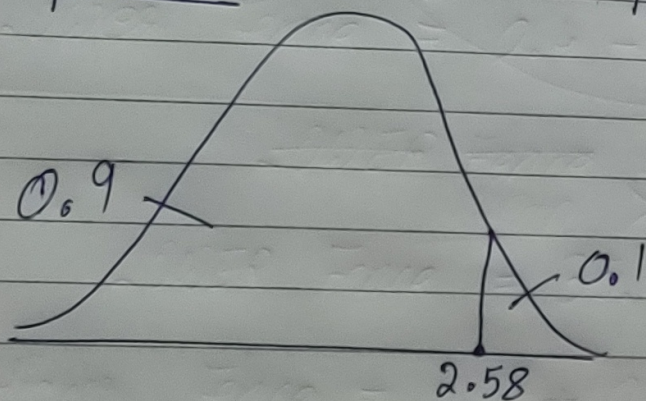
We Reject the null Hypothesis

Which means

City ABC owns more than  
60% of car with 90%  
Confidence interval

p-value

$\boxed{\alpha = 0.1}$



0.99506

$p\text{-value} = 1 - 0.99506$   
 $= \underline{\underline{0.00494}}$

$p\text{-value} < \alpha$

$\therefore$  Reject the null hypothesis.