21 Monday

MAY 2018

Assignment - 5

Que 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 hypothesis testing surveying 250 residents and found that 170 responded 'Yes' to owning a vehicle.

22 Tuesday

(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?

Ans

$n = 250$, $x = 170$.

(1) $H_0 \Rightarrow P_0 = 60\%$.

$H_1 \Rightarrow P_0 \neq 60\%$.

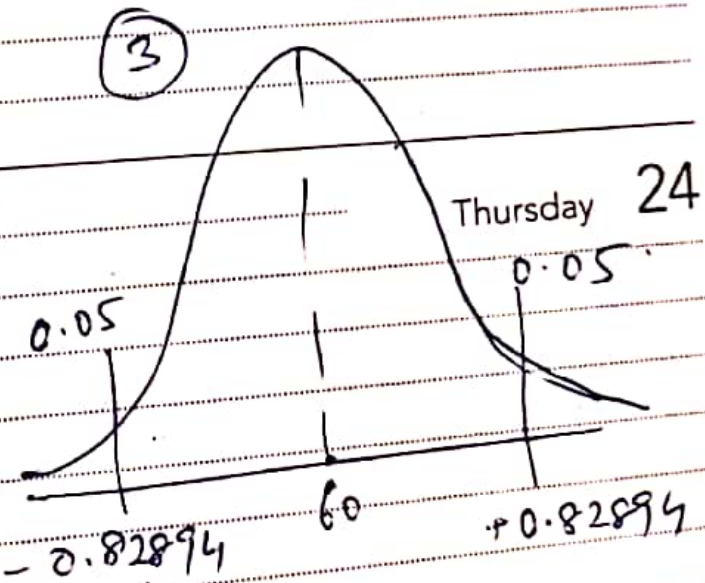
$$\hat{p} = \frac{x}{n} = \frac{170}{250} = \frac{17}{25} = 0.68$$

$$q_0 = 1 - p_0 = 1 - 0.60 = 0.40$$

(2) $\alpha = 0.10$.

$CI = 0.90$.

(3)



$\therefore n \geq 30$

We use z-test.

(4) Decision Interval

z-test with proportion.

$$z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0 q_0}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.60 \times 0.40}{250}}}$$

$$= 2.581$$

25 Friday MAY 2018

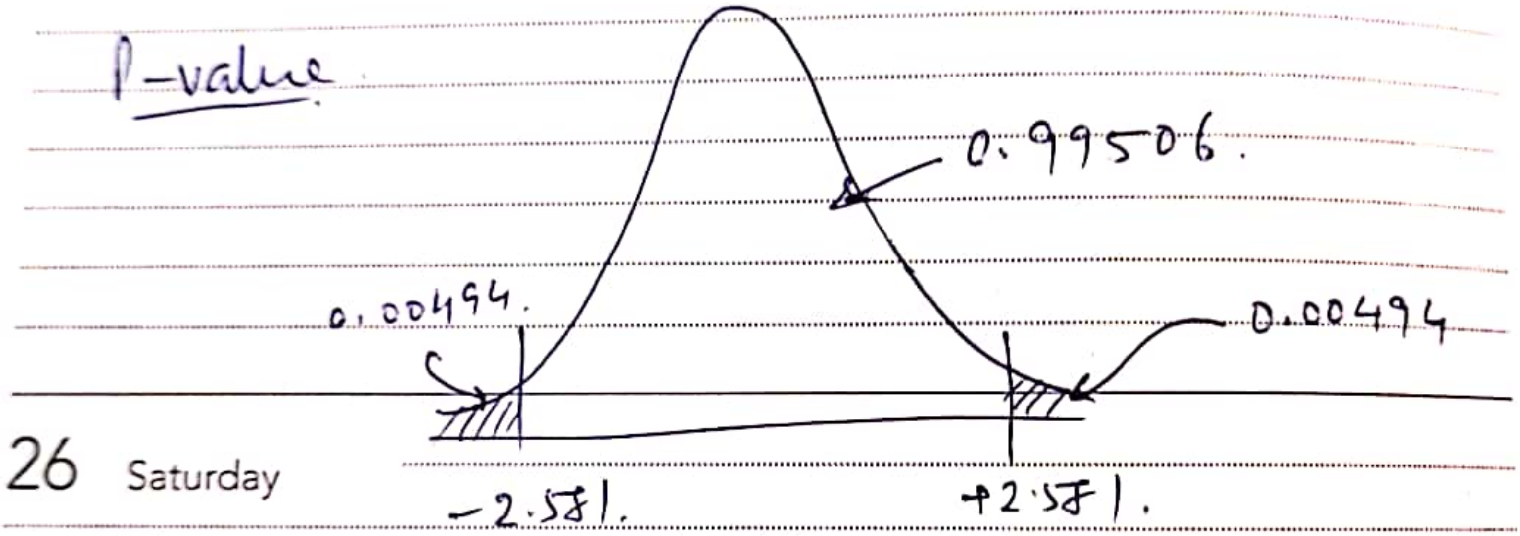
(5) Conclusion:

$2.581 > 0.82894$

∴ We reject Null hypothesis

Vehicle Owner in a city is more than 60%

P-value



26 Saturday

$\therefore 1 - 0.99506$

$= 0.00494$

$0.00494 + 0.00494$

Pvalue $= 0.00988$ and $\alpha = 0.10$

Pvalue < 0.10

We reject null hypothesis.