

Question Two (4-Points)

A survey of 200 executives revealed that 114 of them would rather leave message with a voice mail system than a person. Test the claim that more than half of all executives prefer voice mail systems to leaving a message with a person. Use $\alpha = 0.05$

$$n = 200, x = 114, \bar{p} = \frac{114}{200} = 0.57$$

1. The hypothesis are:

$$H_0: p \leq 0.5$$

$$H_A: p > 0.5$$

2. The test statistic value:

$$Z_c = \frac{\bar{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}} = \frac{0.57 - 0.50}{\sqrt{\frac{(0.5)(0.5)}{200}}} = 1.98$$

3. Decision Rule:

$$Z_\alpha = Z_{0.05} = 1.645$$

$$\text{Reject } H_0 \text{ if } Z_c > Z_\alpha$$

$$1.98 > 1.645$$

\therefore Reject H_0 .

$$P\text{-value} = P(Z > 1.98) = 0.5 - 0.4761 = 0.0239$$

$$\text{Reject } H_0 \text{ if } P\text{-value} < \alpha$$

$$\Rightarrow 0.0239 < 0.05$$

\therefore Reject H_0 .

4. Conclusion

The claim is correct.

or: More than half of all executives prefer voice mail systems to leaving a message with a person.