Assignment

Q. A car comp believes that the percentage of residents in city ABC that owns a vehicles is 60% or less. A sales manager disagrees with this. He conduct a Hypo. surveying 250 residents & found that 170 responded yes to owning a vehicles.

(a) State H_0 & H_1

(b) At 10% S.V (α), is there enough evidence to support the idea that vehicles ownership in city ABC is 60% or less.

Solu

$\Rightarrow \mu = 60$
$\Rightarrow n = 250$
$\Rightarrow \bar{x} = 170$
$\Rightarrow \alpha = 0.10$, C.I $= 0.90$

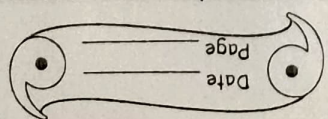
Z test / 2 tailed

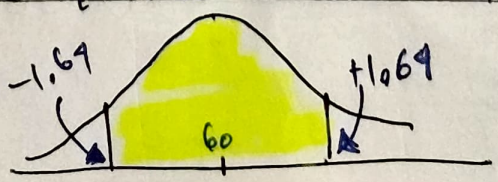
(1) $H_0 = \mu \geq 60$
$H_1 = \mu < 60$

(2) $\hat{p} = \frac{x}{n} = \frac{170}{250} = 0.68$

(3) $p_0 = 60\%$, $q_0 = 1 - p_0 = 1 - 60\%$.
$p_0 = 0.60$ $q_0 \Rightarrow 1 - 0.60 = 0.40$

(4) $\alpha = 0.05 \Rightarrow 1 - 0.05 = 0.95$
from z-table $= +1.64$ & -1.64





⑤ Z test for proportion

$$Z\text{test} = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 Q_0}{n}}}$$

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

$$= \frac{0.08}{\sqrt{\frac{0.24}{250}}}$$

$$= 2.58$$

Here $2.58 > 1.64$ (reject the null hypothesis)

for P value

(From table)

$$A_{2.58} = 1 - 0.99506$$

$$= 0.00494$$

$$P\text{value} = 0.00494 + 0.00494$$

$$= 0.00988$$

Check

$p\text{value} < \alpha$

i.e $0.00988 < 0.10$

Hence rejected