p.value > α.value

0.12 > 0.05.

So accept the null hypothesis

(Q) 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 a hypothesis testing surveying 250 residents and found that 170 responded yes to owning a vehicle.

(a) State the null & alternate hypothesis
(b) At 10% significance level, is there enough confidence to support the idea that vehicle ownership in city ABC is 60% or less?

proportion $P_0 \propto \leq 60\%$
$P_0 \leq 0.6$

$\hat{P} = \dfrac{170}{250} = 0.68$

$P_0 = 0.6$

$q_0 = 1 - 0.6 = 0.4$

$\alpha = 0.01$

$H_0 :- P_0 \leq 60$.
$H_1 :- P_0 > 60$

One tailed test.

$$Z\ \text{test} \Rightarrow \dfrac{\hat{P} - P_0}{\sqrt{\dfrac{P_0\, q_0}{n}}} = \dfrac{0.68 - 0.60}{\sqrt{\dfrac{0.6 \times 0.4}{250}}}$$
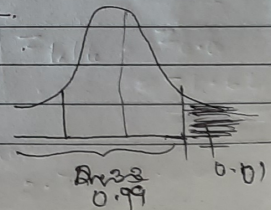
$$= \dfrac{0.08}{\sqrt{\dfrac{0.24}{250}}}$$

$$= 2.581$$

Z table value for 0.01 is

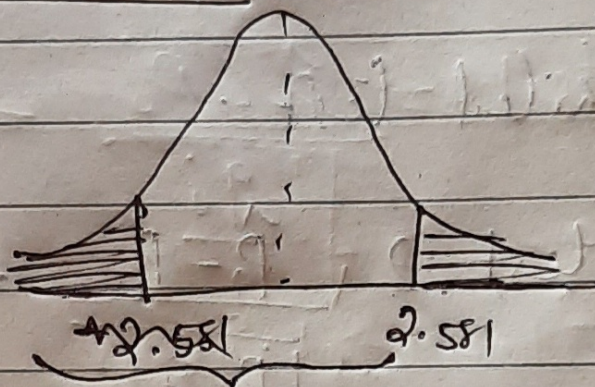$Z_{0.99} = 2.33$

2.33
0.99

$Z_{score} > Z_{table val}.$

$2.581 > 2.33.$

so we reject the null hypothesis
ie, the percentage of people who
owns the vehicle is greater than 60.

Using P value test

$Z_{score} = 2.581$

$\alpha = 0.01$

−2.581   2.581

area under is
curve for $Z_{2.581}$ = 0.99506.

$1 - 0.99506 = 0.0044$

$P_{value} = 0.0044.$

α value = 0.01

$P_{val} < \alpha$ val.
so we reject the null hypoth