Assignment 2 test with proportion

2) A car company believes that the percentage of residants in city ABC that owns a vehicle is 60% or less. A sales manager disagrees with this. He conducts a hypothesis testing surveying 250 residants and found that 170 responded yes to owning a vehicle.

(a) State the Null of and Alternative 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 $H_0 = P_0 = 60\%$ (Null Hypothesis)

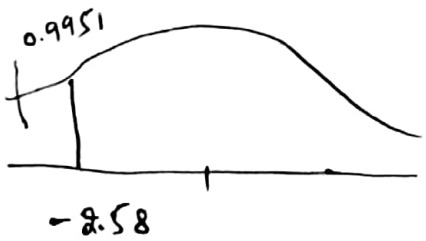
$H_1 = P_0 < 60\%$ (Alternative Hypothesis)

$n = 250 \quad x = 170 \quad \hat{P} = \frac{x}{n} = \frac{170}{250} = 0.68$ and $q = 1 - P_0 = 1 - 0.6$

$q = 0.4$

one tail test

$$Z_{test} = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}} = \frac{0.08}{\sqrt{0.00096}} = 2.58$$



P_{value} < significance value

So, $0.9951 < 0.1$

P_{value} less we reject the Null Hypothesis