Let P be the true population proportion of the licensed U.S. drivers who tailgate other drivers.

Given that,

Sample size, n=

sample proprtion,p^=0.508 ,

therefore, q^=1-p^=0.492

significance level,  α=0.01

We know that,

A 100(1- α) % confidence interval for population proportion P is,

# Formula

(phat -Zalpha/2\*\sqrt{(p\*q)/n) , phat +Zalpha/2\*\sqrt{(p\*q)/n))

a) The conditions are

1) Random condition: The data needs to come from a random sample or randomized experiment.

here we sampls are random sample so the random contion is satisfied

2) Normal: The sampling distribution of p^ is needs to be approximately normal - needs at least 10 expected successes and 10 expected failures.

here, np=2705\*0.508=1374.14>10

and nq=2705\*0.492=1330.86>10

Here condition for normality is satisfied.

3) The independence condition:

Individual observations need to be independent. If sampling without replacement, our sample size shouldn't be more than %10, percent of the population.

So all the necessary conditions are satisfied

#Lower bound

(phat -Zalpha/2\*\sqrt{(p\*q)/n) )

(0.508-2.58\*\sqrt{(0.508\*0.492)/2705))

#Upper Bound

(phat +Zalpha/2\*\sqrt{(p\*q)/n) )

0.508+2.58\*\sqrt{(0.508\*0.492)/2705))

**Interpretation:**

**There is 99% chance that the population proportion of the licensed U.S. drivers who tailgate other drivers is between (4832,0.5327)**