# CS258 Lab 6

1 prop.test(45, 100, conf.level=0.80) => The 80% confidence interval is [0.3827104, 0.5190311]

prop.test(45, 100, conf.level=0.90) => The 90% confidence interval is [0.3657761, 0.5370170]

2 binom.test(9, 10, conf.level=0.80) => The 80% confidence interval is [0.6631523, 0.9895193]

3a n = 5

phat = 4/n

SE = sqrt(phat\*(1-phat)/n)

alpha = 0.1

zstar = -qnorm(alpha/2)

c(phat-zstar \* SE,phat+zstar \* SE)

The 90% confidence interval is [0.5057596, 1.0942404] when n = 5

3b n = 100

phat = 80/n

SE = sqrt(phat\*(1-phat)/n)

alpha = 0.1

zstar = -qnorm(alpha/2)

c(phat-zstar \* SE,phat+zstar \* SE)

The 90% confidence interval is [0.7342059, 0.8657941] when n = 100

3c n = 1000

phat = 800/n

SE = sqrt(phat\*(1-phat)/n)

alpha = 0.1

zstar = -qnorm(alpha/2)

c(phat-zstar \* SE,phat+zstar \* SE)

The 90% confidence interval is [0.7791941, 0.8208059] when n = 1000

4 5\*12 = 60 months

6\*12 = 72 months

* We need all kids 60 to 71 months inclusive

fiveYearOlds = subset(kid.weights, age >= 60 & age < 72)

t.test(fiveYearOlds[1], conf.level=0.90) => The 90% confidence interval is [63.46075, 65.97925]

5 Xbar = 171.45; s = 6.45; n=750

alpha = 0.05

tstar = qt(1 - alpha/2, df = n-1)

SE = s/sqrt(n)

c(Xbar - tstar \* SE, Xbar + tstar \* SE)

The 95% confidence interval is [170.9876, 171.9124]

6.1. phat1 = 74/8198

phat2 = 51/8197

(74/8198)-(51/8197)= 0.002804803 = 0.2804803%

6.2 x = 51

n = 8197

p = 74/8198

prop.test(x, n, p, alt="less")

* p-value = 0.004313

The p-value is very small, so the null hypothesis of the vaccine being ineffective is unlikely. The difference is most likely due to the vaccine.

6.3 prop.test(x, n, p, alt="less", conf.level = 0.96)

No difference, the p-value stays the same.

6.4 1-0.004313=0.995687

“From this data, there is at least a 99.5687% probability that the

difference between phat1, phat2 is not due to chance, i.e. the variation is due to the vaccine”