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Stat318 HW5

2/21/19

1) b) code for calculation of z*

```
> qnorm(1-.01/2)
[1] 2.575829
```

2) b) code for calculation of z*

```
> qnorm(1-.1/2)
[1] 1.644854
```

3) d) code for calculation of p-value

```
> pbinom(5,25,.25)
[1] 0.3782785
```

4) d) code for calculation of p-value

```
> 1-pnorm(3.324897751)
[1] 0.0004422548
```

5)

We are 95% confident that the true proportion of heads of households that own their homes is between .5891 and .6883.

(use Agresti Coull because n=1500 > 40)

```
> binom.confint(921,1500,conf.level=.95,method="agresti-coull")
         method   x    n  mean     lower     upper
1 agresti-coull 921 1500 0.614 0.5891003 0.6383173
```

6)

We are 90% confident that the true proportion of children that have a snack after school is between .4185 and .7038.

(use Wilson because n=30 < 40)

```
> binom.confint(17,30,conf.level = .90, method="wilson")
  method  x  n      mean     lower     upper
1 wilson 17 30 0.5666667 0.4185199 0.7037835
```

7)

a) Use Score Test. n*po = 310 n(1-po) = 690

b)

```
> prop.test(210,1000,p=.31, alternative="two.sided", correct= F)

        1-sample proportions test without continuity
        correction

data:  210 out of 1000, null probability 0.31
X-squared = 46.751, df = 1, p-value = 8.061e-12
alternative hypothesis: true p is not equal to 0.31
95 percent confidence interval:
 0.1858889 0.2363306
sample estimates:
   p
0.21
```

c)

Ho: p=.31

Ha: p ≠ .31

$(TS)^2$= 46.751

p-value= 8.061e-12

Interpretation: If the null hypothesis, that the proportion of Americans “not at all” interested in international and foreign policy issues is .31, is true, we would expect to see data like ours, or more extreme, 8.061e-10 % of the time.

Conclusion: There Is very strong evidence in favor of the alternative hypothesis that the proportion of Americans “not at all” interested in international and foreign policy is not equal to .31.

8)

a) Use the Binomial Exact Test. n*po= 16.2>15, but n(1-po) =1.8<15

b)

```
> binom.test(17,18,p=.9, alternative= "greater")

        Exact binomial test

data:  17 and 18
number of successes = 17, number of trials = 18,
p-value = 0.4503
alternative hypothesis: true probability of success is greater than 0.9
95 percent confidence interval:
 0.7623391 1.0000000
sample estimates:
probability of success
             0.9444444
```

c)

Ho: p=.9

Ha: p>.9

Bc= 17

P-value= .4503

Interpretation: If the null hypothesis, that the proportion of people who like chocolate is equal to .9, is true, we would expect to see data like ours, or more extreme, 45.03% of the time.

Conclusion: There is little to no evidence to support the alternative hypothesis that the proportion of people who like chocolate is greater than .9.