Tram Le

Homework 3:

1. Put all information in vector
   a. The point estimate p = #rotten oranges/ #total oranges = 0.1142
   b. Expected count based on a Bin(10,0.1142). Using bionomial probability distribution function to find E: dbinom(c(0:10), 10, p)
   c. Add all expected value less than 5

Number Rotten	0	1	2	3	4	5 and more
Observed count	334	369	191	63	22	21
Expected count	297.4	383.4	222.4	76.5	17.3	3.0

   d. Put new value on both counts into vector then Compute X^2 statistic :
      - Chi^2 = sum(Observed Count – Expected Count) ^2 / Expected Count = 121.14
   e. At alpha = .05 compute p-value
      - The degree of freedom is 6-1-1 = 4

      P-value = P(chi^2 > 121.14) = 0.0000… < 0.05 the alpha

At X^2 alpha level is 9.49 is way smaller than 121.14 or we could say the P-value is very small than significant level. So we reject H0 and conclude that there is evidence that rotten oranges do not follow distribution of Bin(10,p)

2. Put all information in matrix with 3 row and 3 column

a. H0: Number of years of college a person has completed is independent of location residence

   Ha: Number of years of college a person had completed is dependent of location

b. Extract data to see Observed matrix

```
     [,1] [,2] [,3]
[1,]   15   12    8
[2,]    8   15    9
[3,]    6    8    7
```

c. Extract data to see Expected matrix

```
          [,1]        [,2]        [,3]
[1,] 11.534091   13.920455   9.545455
[2,] 10.545455   12.727273   8.727273
[3,]  6.920455    8.352273   5.727273
```

d. Using chisq.test() function on both count to see X^2 statistic

   X^2 = 3.006

e. With chisq.test() we can see the df = 4 at alpha .05, then compute X^2 alpha using qchisq()

   X^2 alpha = 9.49

f. P-value (X^2 > 3.006) = 1- pchisq(3.006, df = 4) = 0.56

g. Inconclusion, since p-value > 0.05, we fail to reject H0 and conclude that there is insufficient evidence to support number of years of college a person has competed is related to their location

3.

- On height sample t-test, 95% confidence interval: [67.97, 68.02]. Since p-value < 2.2e-16 is less than significant level < 0.05, we reject H0 which means height is not equal to 0

  On weight sample t-test, 99% confidence interval: [126.89, 127.27], Since p-value < 2.2e-16 is less than significant level < 0.05, we reject H0 which means height is not equal to 0