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Stat318 HW2

1/27/19

2) Code for calculation of t in part c)

```
> qt(1-.05/2 , 99)
[1] 1.984217
```

4) Code for calculation of t in part a)

```
> qt(1-.05/2, 79)
[1] 1.99045
```

5) Code for calculation of p-value in part c)

```
> pt(-2.5298,39)
[1] 0.007782101
```

6) Code for calculation of p-value in part c)

```
> 1-pt(4.2031,37)
[1] 7.983799e-05
```

7) The null hypothesis is that the average human body temperature is 98.6 degrees Fahrenheit. The alternative hypothesis is that the average human body temperature is not 98.6 degrees Fahrenheit. The test statistic, t, was calculated to be -1.6522. The p-value was calculated to be .1329.

Interpretation: If the null hypothesis that the average human body temperature is 98.6 degrees Fahrenheit is true, we would expect to see data like ours, or more extreme, 13.29 percent of the time.

Conclusion (p-value greater than .1): There is little to no evidence to support the alternative hypothesis that the average human body temperature is not 98.6 degrees Fahrenheit.

```
> temp.data1= c(98.5,98.2,99,96.3,98.3,98.7,97.2,99.1,98.7,97.2)
> t.test(temp.data1,mu=98.6,alternative = "two.sided")
                One Sample t-test
data:  temp.data1
t = -1.6522, df = 9, p-value = 0.1329
alternative hypothesis: true mean is not equal to 98.6
95 percent confidence interval:
 97.46281 98.77719
sample estimates:
mean of x
   98.12
```

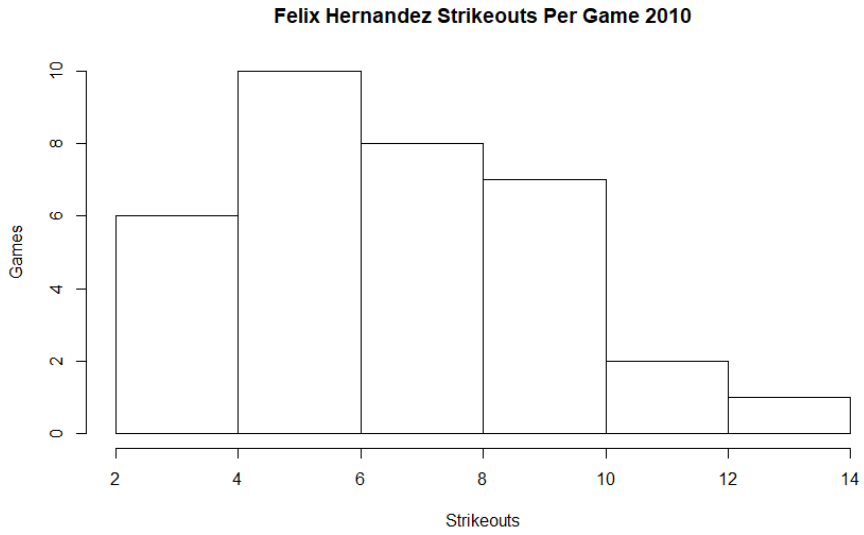
8)

a) The mean of the data is 6.2823529 and the standard deviation is 2.516257.

```
 > king.data1= c(4,5,9,6,7,5,3,7,6,6,7,9,5,9,9,8,11,6,9,3,8,3,4,3,13,7,11,9,8,9,5,8,5,5)
> mean(king.data1)
[1] 6.823529
> sd(king.data1)
[1] 2.516257
```

b)

```
> hist(king.data1,xlab="Strikeouts",ylab="Games", main="Felix Hernandez Strikeouts Per Game 2010")
```



c)

```
> t.test(king.data1,conf.level=.98)
```

One Sample t-test

```
data:  king.data1
t = 15.812, df = 33, p-value < 2.2e-16
alternative hypothesis: true mean is not equal to 0
98 percent confidence interval:
 5.768516 7.878543
sample estimates:
mean of x
 6.823529
```

d) We are 98% confident that the true mean number of strikeouts per game for Felix Hernandez' 2010 Cy Young season is between 5.768516 and 7.878543.

9)

a)

```
> home.data1= read.delim("clipboard",header=T)
> attach(home.data1)
> home.data2= home.data1[,1]
> mean(home.data2)
[1] 2.895
> sd(home.data2)
[1] 1.125451
```

b) *no units were given in this problem for the size of the houses, so I did not include any in my answers even though I'd assume it would be in thousands of square feet.
We are 95% confident that the true average size of homes for sale in Murrells Inlet, SC is between 2.535 063 and 3.254937.

```
> t.test(home.data2, conf.level=.95)

        One Sample t-test

data:  home.data2
t = 16.269, df = 39, p-value < 2.2e-16
alternative hypothesis: true mean is not equal to 0
95 percent confidence interval:
 2.535063 3.254937
sample estimates:
mean of x
   2.895
```

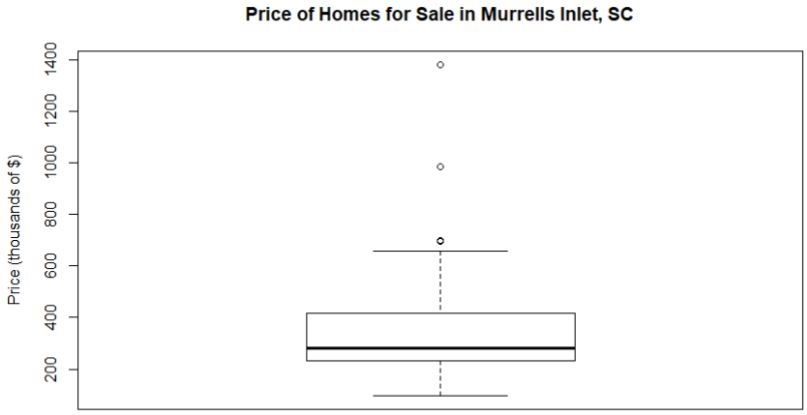
c)

```
> home.data3=home.data1[,2]
> mean(home.data3)
[1] 365.675
> sd(home.data3)
[1] 246.5037
```

9)

d)

```
> boxplot(home.data3, ylab= "Price (thousands of $)", main= "Price of Homes for Sale in Murrells Inlet, SC")
```



e) Ho: the average price of a house for sale in Murrells Inlet, SC is $300,000.

Ha: the average price of a house for sale in Murrells Inlet, SC is greater than $300,000.

The test statistic, t, was calculated to be 1.685. The p-value was found to be .04999.

```
> t.test(home.data3, mu=300, alternative = "greater")

        One Sample t-test

data:  home.data3
t = 1.685, df = 39, p-value = 0.04999
alternative hypothesis: true mean is greater than 300
95 percent confidence interval:
 300.0059      Inf
sample estimates:
mean of x
  365.675
```

Interpretation: If the null hypothesis is true that the average price of homes for sale in Murrells Inlet, SC is 300, we would expect to see data like ours, or more extreme, 4.999 percent of the time.

Conclusion (p-value between .01 and .05): There is strong evidence in favor of the alternative hypothesis that the average price of a house for sale in Murrells Inlet, SC is greater than $300,000.