STT 863 HW1

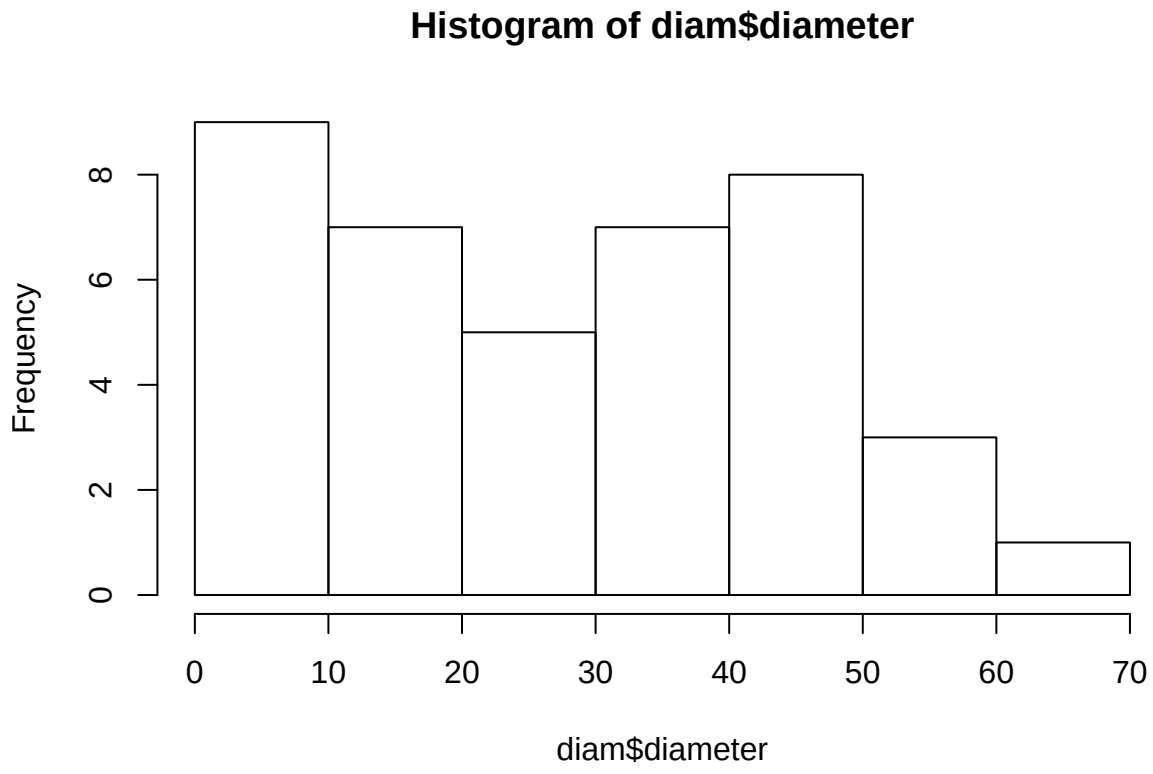
Kenyon Cavender

9/24/2019

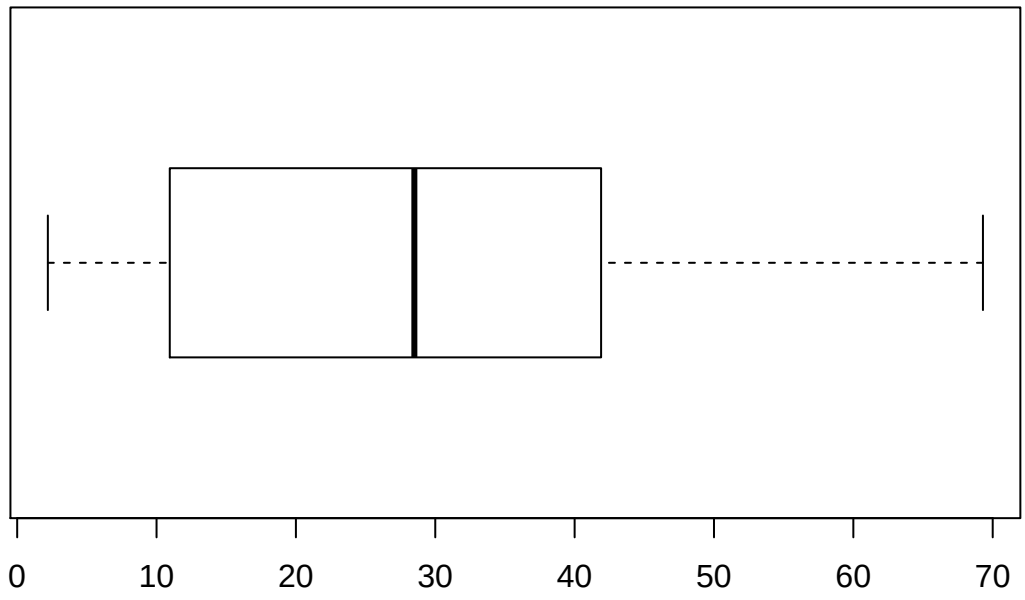
R Markdown

This is Kenyon Cavender's homework for STT 863.

```
library(MASS)
diam <- read.table(file="DBH.txt", header=TRUE)

#Part A
hist(diam$diameter)
```




```
#The histogram diminishes towards the left. Most of the trees are between 0 and 50 cm.

#Part B
boxplot(diam$diameter, main= "Tree Diameter at Breast Height", xlab="Diameter in CM", horizontal=TRUE)
```




```
#This boxplot does not seem to show any outliers.

#Part C
summary(diam$diameter)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    2.20   11.18   28.50   27.29   41.20   69.30
```

```
#Part D
sample_mean <- mean(diam$diameter)
std_dev <- sd(diam$diameter)
samp_size <- length(diam$diameter)

print(std_dev)
```

```
## [1] 17.70584
```

```
t.test(diam$diameter)
```

```
##
##  One Sample t-test
##
## data:  diam$diameter
## t = 9.748, df = 39, p-value = 5.245e-12
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##  21.6274 32.9526
## sample estimates:
```

```
## mean of x
##     27.29
```

```
#Part E
t.test(diam$diameter, alternative = "less", mu=30, conf.level = .9)
```

```
##
##  One Sample t-test
##
## data:  diam$diameter
## t = -0.96802, df = 39, p-value = 0.1695
## alternative hypothesis: true mean is less than 30
## 90 percent confidence interval:
##      -Inf 30.93959
## sample estimates:
## mean of x
##     27.29
```

```
#Part F
qt(.995, df=39) * std_dev/sqrt(1+1/samp_size)
```

```
## [1] 47.35757
```

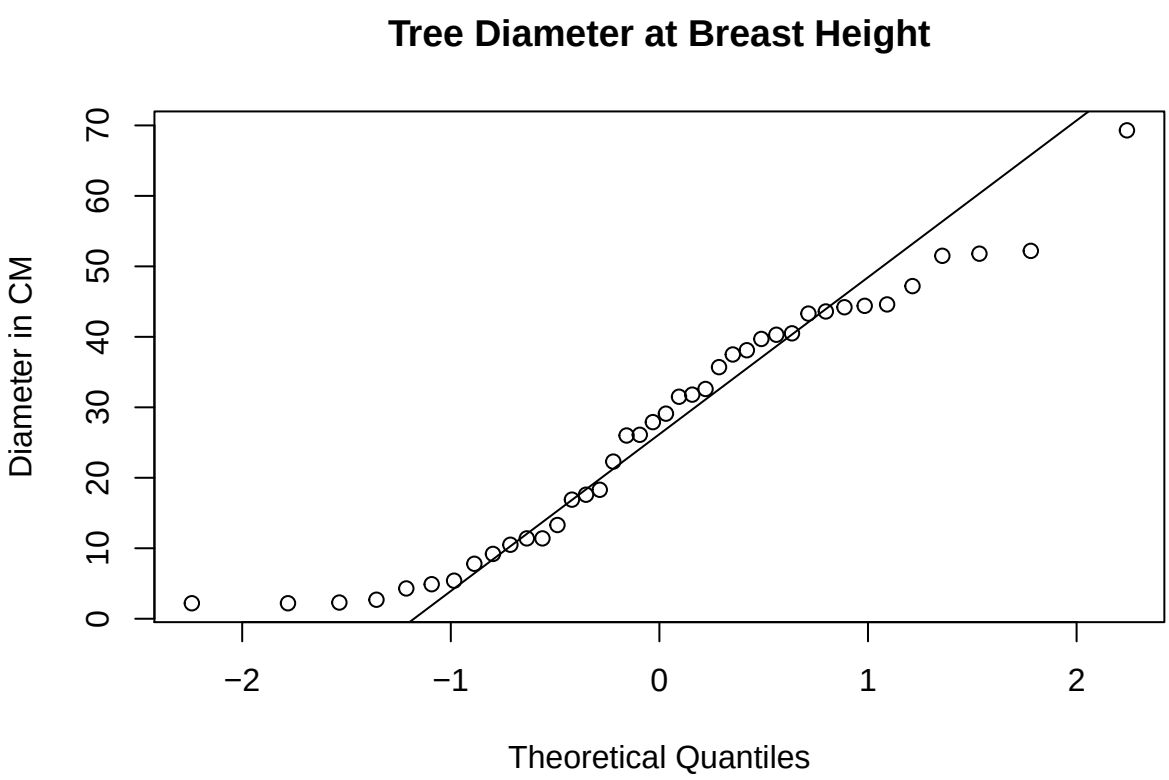
```
#below was another attempt
#predict(diam$diameter, interval="prediction", level=0.99)


error <- qt(.975, df=samp_size-1)*std_dev*sqrt(1+1/samp_size)
left = sample_mean-error
right = sample_mean+error
left
```

```
## [1] -8.968349
```

```
right
```

```
## [1] 63.54835
```

```
#Part G
qqnorm(diam$diameter, main= "Tree Diameter at Breast Height", ylab="Diameter in CM")
qqline(diam$diameter)
```


Tree Diameter at Breast Height
Diameter in CM
0
10
20
30
40
50
60
70
−2
−1
0
1
2
Theoretical Quantiles