MATH 324 Computer HW 1

Corey Russ

Due: 2/14/19

Exercise 1:

(a) Use c() to generate two datasets.

```
modifiedMortar=c(16.85, 16.40, 17.21, 16.35, 16.52, 17.04, 16.96, 17.15, 16.59, 16.57)
unmodifiedMortar=c(16.62, 16.75, 17.37, 17.12, 16.98, 16.87, 17.34, 17.02, 17.08, 17.27)
```

(b) Use mean() and median() to calculate the mean and median of each dataset.

```
mean(modifiedMortar)
```

```
## [1] 16.764
```

```
median(modifiedMortar)
```

```
## [1] 16.72
```

```
mean(unmodifiedMortar)
```

```
## [1] 17.042
```

```
median(unmodifiedMortar)
```

```
## [1] 17.05
```

(c) Use sd(), var() and IQR() to calculate the sample standard deviation, sample variance and IQR of each dataset.

```
sd(modifiedMortar)
```

```
## [1] 0.3164455
```

```
var(modifiedMortar)
```

```
## [1] 0.1001378
```

```
IQR(modifiedMortar)
```

```
## [1] 0.4875
```

```
sd(unmodifiedMortar)
```

```
## [1] 0.2479158
```

```
var(unmodifiedMortar)
```

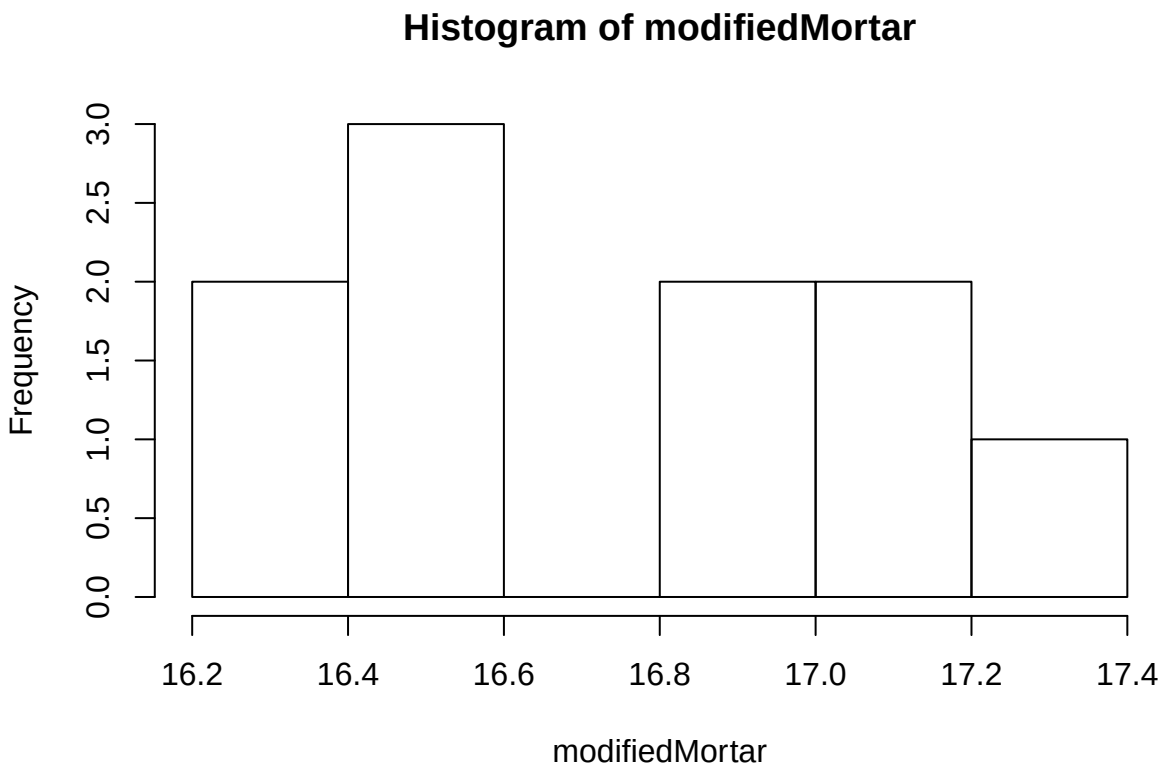
```
## [1] 0.06146222
```

```
IQR(unmodifiedMortar)
```

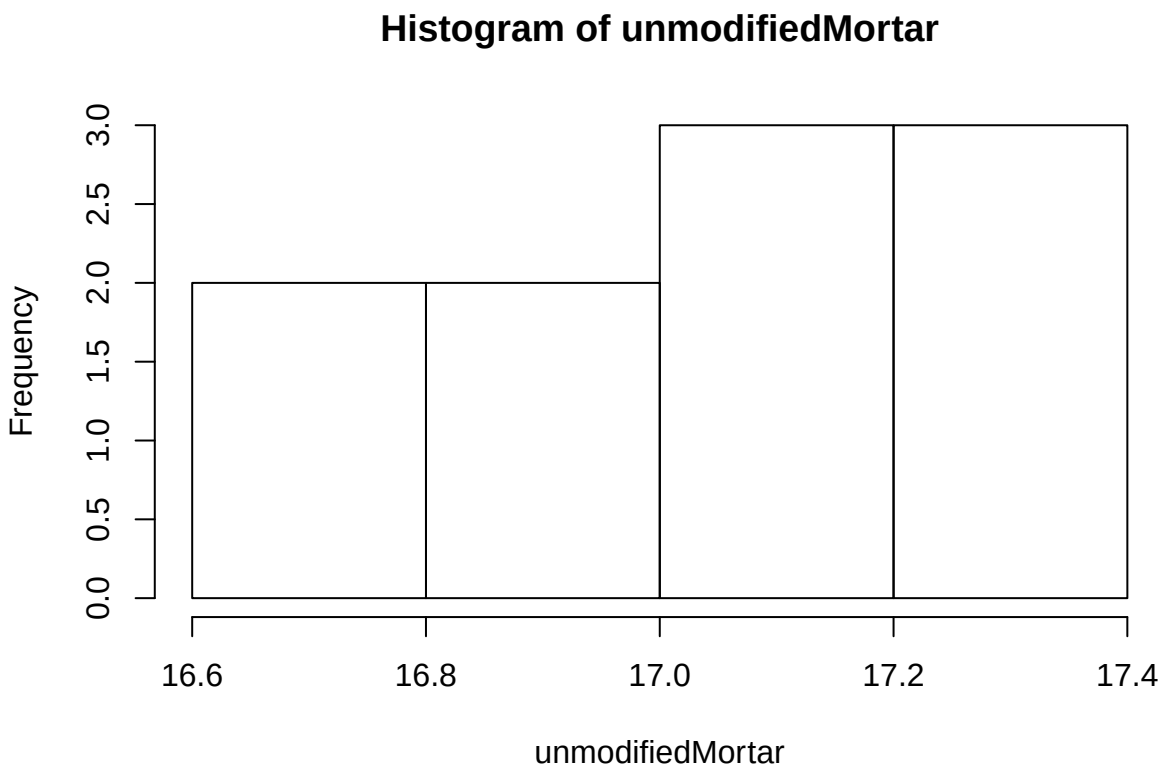
```
## [1] 0.335
```

(d) Construct the histograms for the two datasets and make comments about the shapes.

```
hist(modifiedMortar)
```




```
hist(unmodifiedMortar)
```

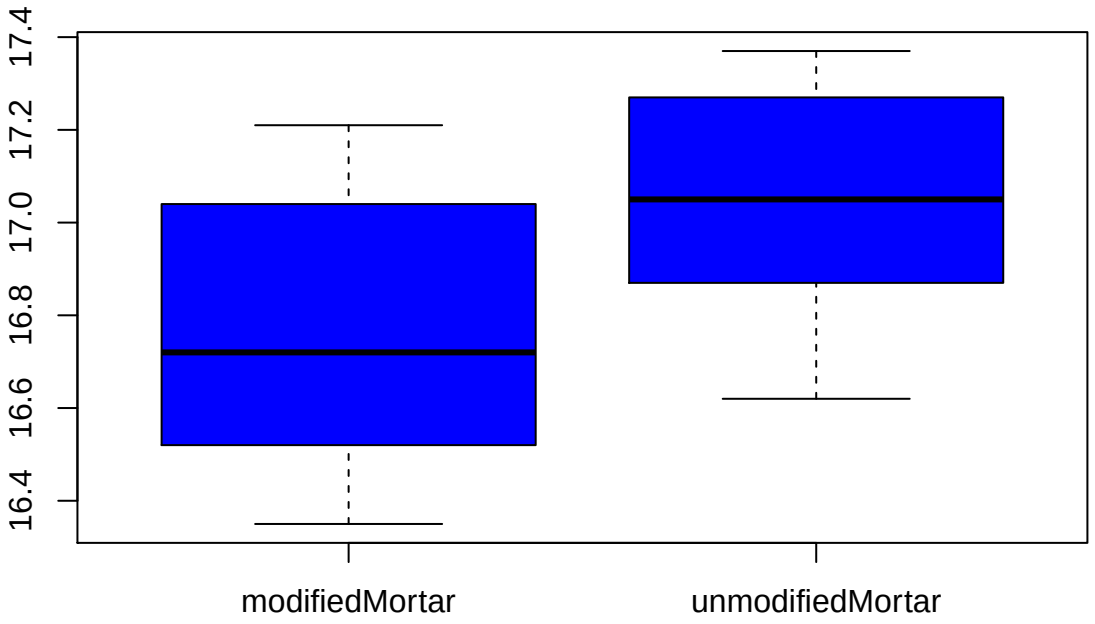


The modified mortar has one cluster of data with higher frequency. The unmodified mortar is more spread

out over all of the data.

(e) Construct comparative box-plots for the two groups and make comments about the similarity and difference.

```
boxplot(list(modifiedMortar=modifiedMortar, unmodifiedMortar=unmodifiedMortar), col="blue")
```



The median of the modified mortar is lower than the median of the unmodified mortar. The median of the unmodified mortar is the Q3 of modified mortar.

Exercise 2:

(a) Use c() to generate the data.

```
survey=c(4, 2, 3, 3, 1, 5, 4, 2, 2, 4,
         5, 6, 4, 3, 3, 4, 4, 5, 6, 1,
         2, 2, 3, 4, 3, 3, 5, 2, 1, 3)
```

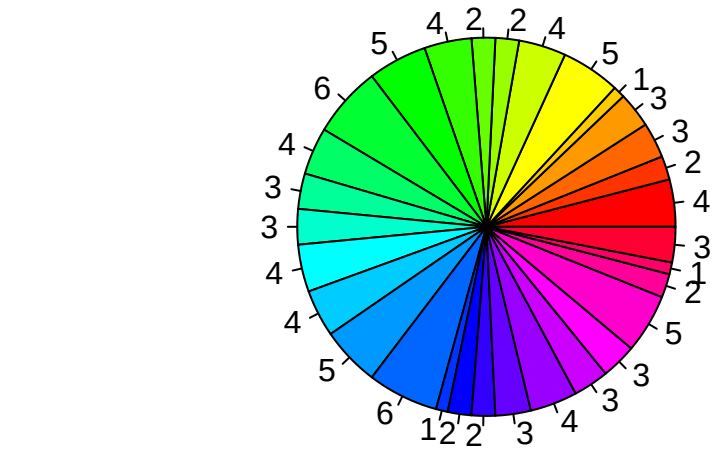
(b) Construct the frequency table using table().

```
table(survey)
```

```
## survey
## 1 2 3 4 5 6
## 3 6 8 7 4 2
```

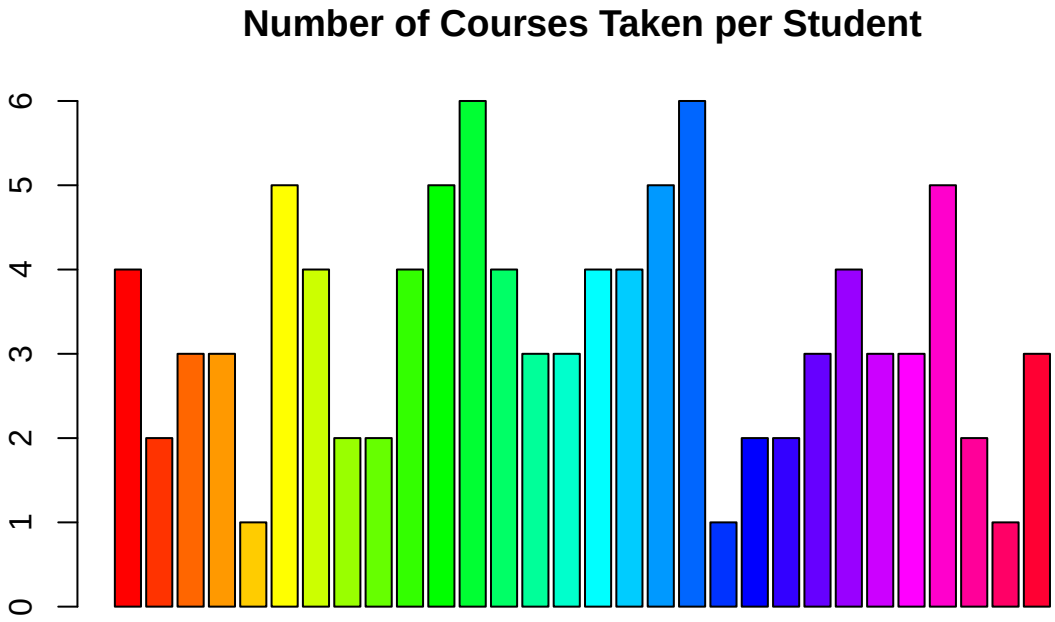
(c) Construct pie chart using pie(). Add colors and title to the chart.

```
pie(survey,labels=survey[1:30],col=rainbow(30), main="Number of Courses Taken per Student for 30 Studen
```



(d) Construct bar-plot using barplot(). Add color and title to the plot.

```
barplot(survey, col=rainbow(30),main="Number of Courses Taken per Student")
```



(e) Use R functions to count how many students are taking more than three courses.

```
sum(survey>3)
```

```
## [1] 13
```

Exercise 3:

(a) Use seq() to generate a sequence 2, 4, . . . , 24.

```
sequence=seq(2,12, by=2)
```

(b) Use log() to generate a new sequence where each element is log-transformed from the sequence in (a).

```
sequence=log10(sequence)
```

(c) Remove the second to fifth elements in the resulting sequence in (b).

```
sequence=sequence[-(2:5)]
```

(d) Use length() to obtain the length of the resulting sequence in (c).

```
length(sequence)
```

```
## [1] 2
```

(e) Sort the resulting sequence in (d) from high to low using sort().

```
sort(sequence, decreasing=TRUE)
```

```
## [1] 1.079181 0.301030
```