Computer Project #1

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MATH 324 Computer Project 1

Exercise 1:

a)

```
x <- c(16.85,16.4,17.21,16.35,16.52,17.04,16.96,17.15,16.59,16.57)
y <- c(16.62,16.75,17.37,17.12,16.98,16.87,17.34,17.02,17.08,17.27)
```

b)

```
print("Modified Mortar (x): ")
```

```
## [1] "Modified Mortar (x): "
```

```
#mean(x)
paste0("Mean: ", mean(x))
```

```
## [1] "Mean: 16.764"
```

```
#median(x)
paste0("Median: ", median(x))
```

```
## [1] "Median: 16.72"
```

```
print("Unmodified Mortar (y): ")
```

```
## [1] "Unmodified Mortar (y): "
```

```
#mean(x)
paste0("Mean: ", mean(y))
```

```
## [1] "Mean: 17.042"
```

```
#median(x)
paste0("Median: ", median(y))
```

```
## [1] "Median: 17.05"
```

c)

```
print("Modified Mortar (x): ")
```

```
## [1] "Modified Mortar (x): "
```

```
#sd(x)
paste0("Sample standard deviation: ", sd(x))
```

```
## [1] "Sample standard deviation: 0.316445536827078"
```

```r
  #var(x)
  paste0("Sample variance: ", var(x))
```

```
## [1] "Sample variance: 0.100137777777778"
```

```r
  #IQR(x)
  paste0("Interquartile range: ", IQR(x))
```

```
## [1] "Interquartile range: 0.487500000000001"
```

```r
  print("Unmodified Mortar (y): ")
```

```
## [1] "Unmodified Mortar (y): "
```

```r
  #sd(x)
  paste0("Sample standard deviation: ", sd(y))
```

```
## [1] "Sample standard deviation: 0.247915756300849"
```

```r
  #var(x)
  paste0("Sample variance: ", var(y))
```

```
## [1] "Sample variance: 0.0614622222222221"
```

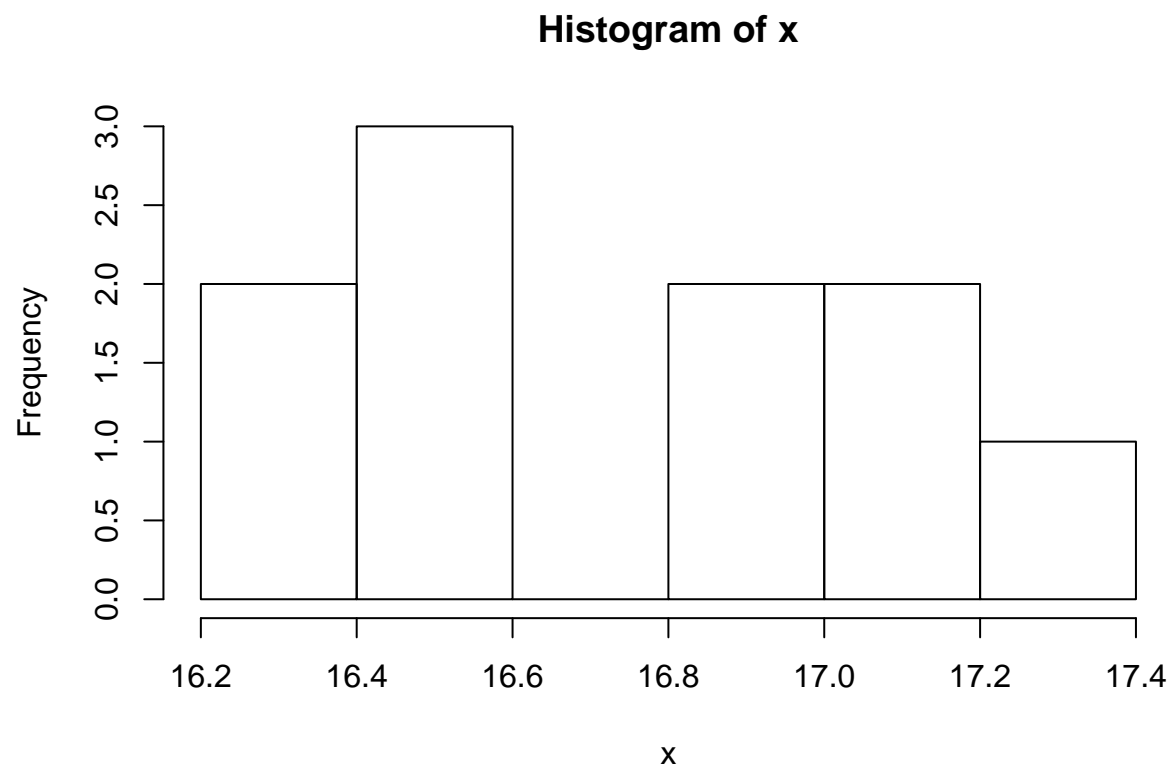```r
  #IQR(x)
  paste0("Interquartile range: ", IQR(y))
```

```
## [1] "Interquartile range: 0.335000000000001"
```

d)

```r
  print("Modified Mortar (x): ")
```
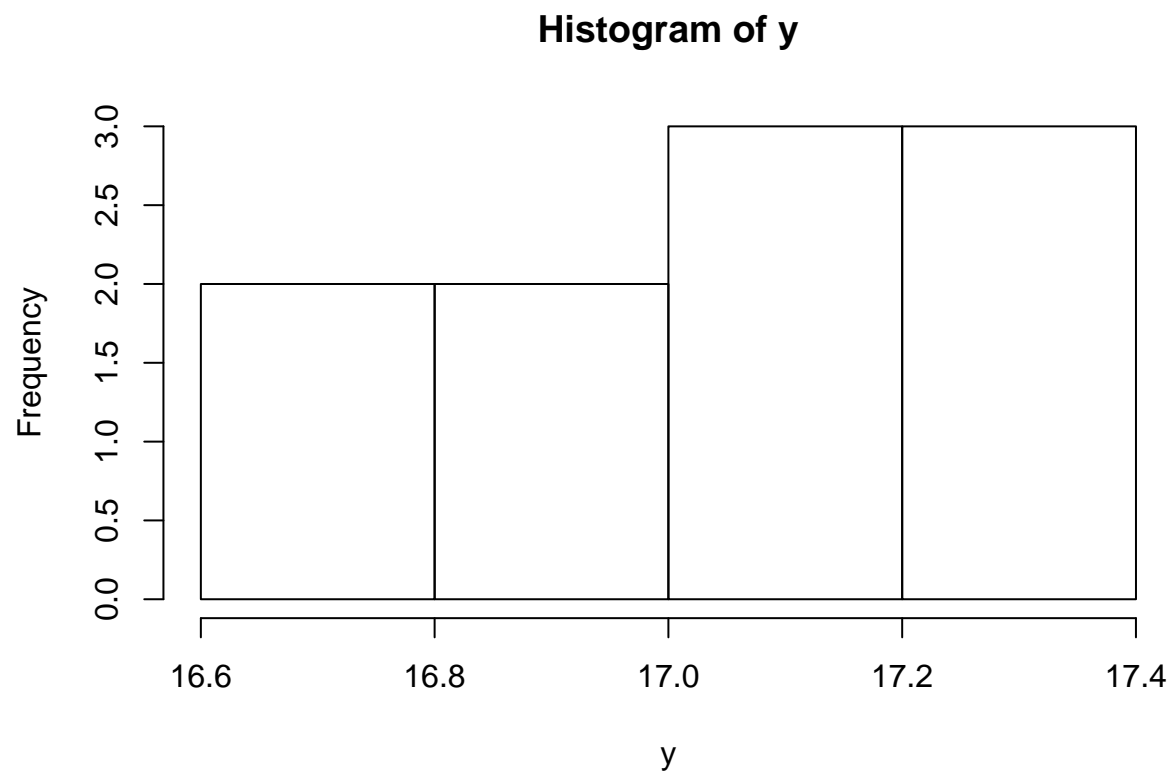
```
## [1] "Modified Mortar (x): "
```

```r
  hist(x)
```

Histogram of x


```r
print("Unmodified Mortar (y): ")
```

```
## [1] "Unmodified Mortar (y): "
```
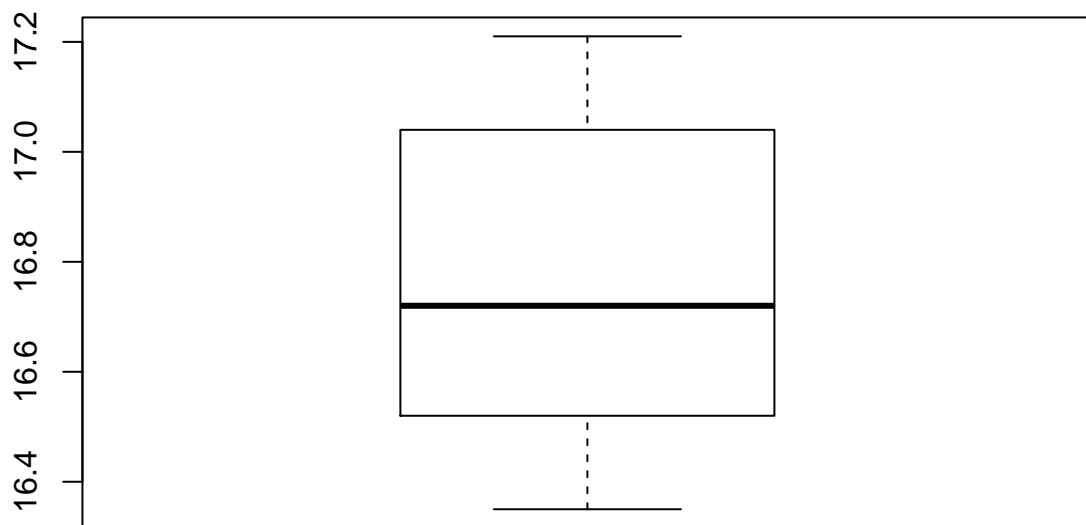
```r
hist(y)
```

Histogram of y

e)

```r
print("Modified Mortar (x): ")
```
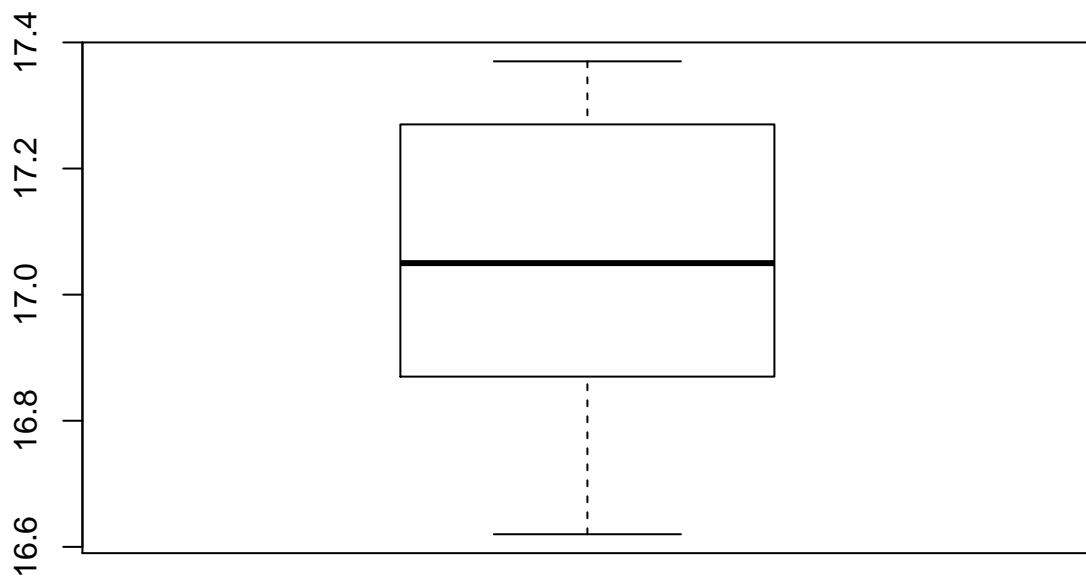
```
## [1] "Modified Mortar (x): "
```

```r
boxplot(x)
```

4

```r
print("Unmodified Mortar (y): ")
```

```
## [1] "Unmodified Mortar (y): "
```
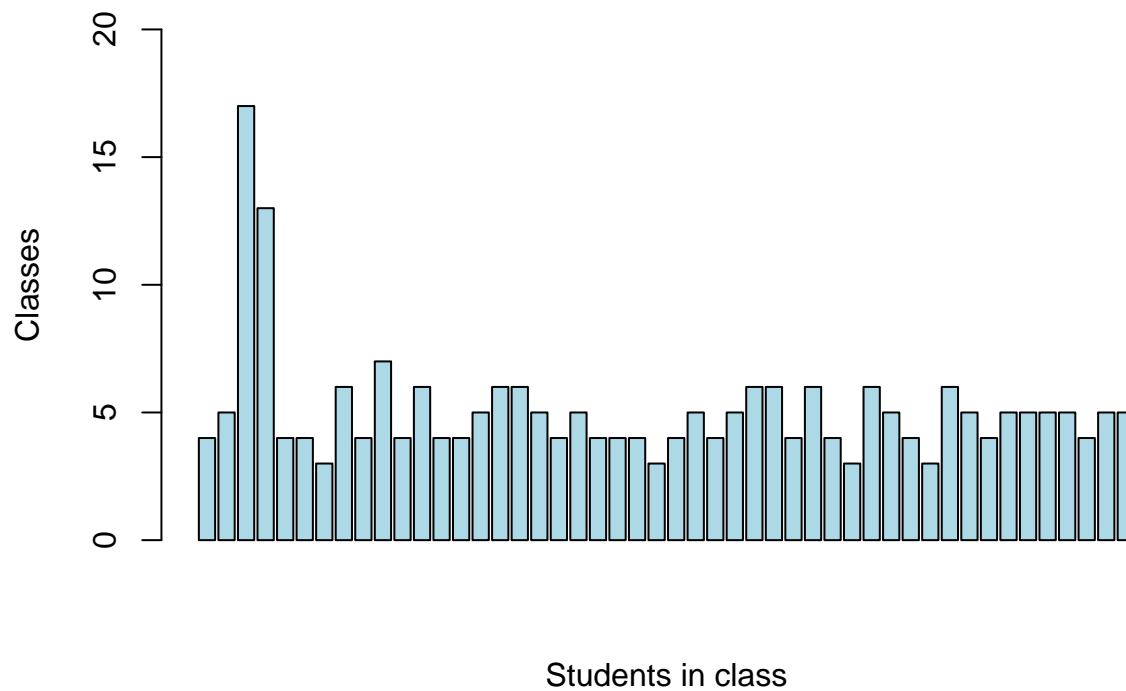
```r
boxplot(y)
```

Exercise 2:

a)

```
z <- c(4,5,17,13,4,4,3,6,4,7,4,6,4,4,5,6,6,5,4,5,4,4,4,3,4,5,4,5,6,6,4,6,4,3,6,5,4,3,6,5,4,5,5,5,5,4,5
table(z)
```

```
## z
##  3  4  5  6  7 13 17
##  4 18 14  9  1  1  1
```

b)

```
barplot(z, ylim = c(0,20), ylab ="Classes", xlab = "Students in class", col = c("light blue"))
```

Students in class

c)

```
count <- 0
for (i in z){
  if (i > 3){
    count <- count + 1
    print (count)
  }
}
```

```
## [1] 1
## [1] 2
## [1] 3
## [1] 4
## [1] 5
## [1] 6
## [1] 7
## [1] 8
## [1] 9
## [1] 10
## [1] 11
## [1] 12
## [1] 13
## [1] 14
## [1] 15
## [1] 16
## [1] 17
## [1] 18
```

```
## [1] 19
## [1] 20
## [1] 21
## [1] 22
## [1] 23
## [1] 24
## [1] 25
## [1] 26
## [1] 27
## [1] 28
## [1] 29
## [1] 30
## [1] 31
## [1] 32
## [1] 33
## [1] 34
## [1] 35
## [1] 36
## [1] 37
## [1] 38
## [1] 39
## [1] 40
## [1] 41
## [1] 42
## [1] 43
## [1] 44
```

d)

Yes there is outliers, and they are 17 and 13.

```
paste0 ("Interquartile range: ", IQR(unlist(z)))
```

```
## [1] "Interquartile range: 1.25"
```

```
quantile(z)
```

```
##     0%   25%   50%   75%  100%
##   3.00  4.00  5.00  5.25 17.00
```

Exercise 3:

a)

```
xd <- seq(from=2, to=24, by=2)
```

b)

```
log(xd)
```

```
##  [1] 0.6931472 1.3862944 1.7917595 2.0794415 2.3025851 2.4849066 2.6390573
##  [8] 2.7725887 2.8903718 2.9957323 3.0910425 3.1780538
```

c)

```
remove <- c(4, 6, 8, 10)
xd %in% remove
```

```
##  [1] FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE
## [12] FALSE
```

```
xd [! xd %in% remove]
```

```
## [1]  2 12 14 16 18 20 22 24
```

d)

```
length(xd [! xd %in% remove])
```

```
## [1] 8
```

e)

```
sort(xd [! xd %in% remove])
```

```
## [1]  2 12 14 16 18 20 22 24
```