MATH 324 Homework 1

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```
BMI = c(68,65,64,67,93,68,89,69,67,68,89,90,93,93,66,70,70,92,69,
        72,86,86,97,71,95)
BMI
```

```
##  [1] 68 65 64 67 93 68 89 69 67 68 89 90 93 93 66 70 70 92 69 72 86 86 97 71 95
```

I saved the data in an object called BMI for simplicity.

Part A is in the following chunk.

```
sort(BMI) # Saving the numbers in an object to operate from.
```

```
##  [1] 64 65 66 67 67 68 68 68 69 69 70 70 71 72 86 86 89 89 90 92 93 93 93 95 97
```

```
length(BMI) # Verifying that I entered everything in correctly.
```

```
## [1] 25
```

```
stem(BMI, scale = 2) # Using scale = 2 as per instructions.
```

```
##
##   The decimal point is 1 digit(s) to the right of the |
##
##   6 | 4
##   6 | 567788899
##   7 | 0012
##   7 |
##   8 |
##   8 | 6699
##   9 | 02333
##   9 | 57
```

Part B is in the following chunk

```
xbar = mean(BMI)
xbar # Average of the numbers in the object BMI.
```

```
## [1] 78.28
```

```
SD_BMI = sd(BMI)
SD_BMI # Standard deviation of the numbers in the object.
```

```
## [1] 12.00528
```

Part C is in the following chunk

```
summary(BMI) # Base R function summary generates 5 number summaries.
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
```

```
##   64.00   68.00   71.00   78.28   90.00   97.00
```

In the above chunk, I used the base R function known as summary that generates the five-number summary automatically. The five-number summary that I got was were MIN = 64.00, Q1 = 68.00, MED = 71.00, MEAN = 78.28, Q3 = 90.00, and MAX = 97.00. When computing the IQR directly, I subtracted Q1 from Q3 and got 22.00 as a result.

Part D is in the following chunk:

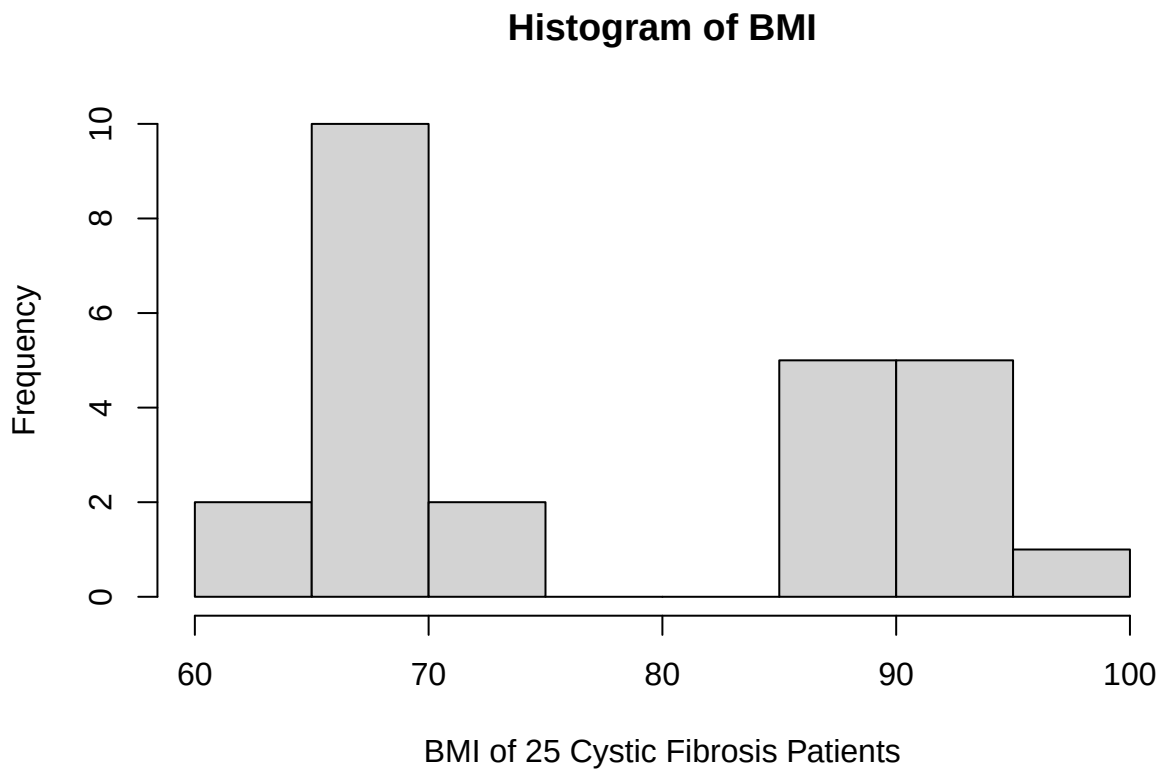
```
Q1_BMI = quantile(BMI, 1/4)
Q3_BMI = quantile(BMI, 3/4)

IQR = Q3_BMI - Q1_BMI
IQR # Interquartile range of the numbers.
```

```
## 75%
##  22
```

To compute the interquartile range, I computed Q1 and Q3 manually using the quantile function in R. I computed the interquartile range to be 22. I did this to verify that the summary function worked correctly.

Part E is in the following chunk:

```
hist(BMI, breaks = seq(60, 100, 5),
     xlab = "BMI of 25 Cystic Fibrosis Patients")
```



Part F is in the following chunk:

```
first <- 100*sum((BMI >= 60 & BMI < 65)/ length(BMI))
second <- 100*sum((BMI >= 65 & BMI < 70)/ length(BMI))
```

```r
third <- 100*sum((BMI >= 70 & BMI < 75)/ length(BMI))
fourth <- 100*sum((BMI >= 75 & BMI < 80)/ length(BMI))
fifth <- 100*sum((BMI >= 80 & BMI < 85)/ length(BMI))
sixth <- 100*sum((BMI >= 85 & BMI < 90)/ length(BMI))
seventh <- 100*sum((BMI >= 90 & BMI < 95)/ length(BMI))
eighth <- 100*sum((BMI >= 95 & BMI < 100)/ length(BMI))

first # Object containing the first percentage range of 60-65.
```

```
## [1] 4
```

```r
second
```

```
## [1] 36
```

```r
third
```

```
## [1] 16
```

```r
fourth
```

```
## [1] 0
```

```r
fifth
```

```
## [1] 0
```

```r
sixth
```

```
## [1] 16
```

```r
seventh
```

```
## [1] 20
```

```r
eighth
```

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

```r
total = first + second + third + fourth + fifth + sixth + seventh + eighth
total # verified that I computed everything correctly.
```

```
## [1] 100
```

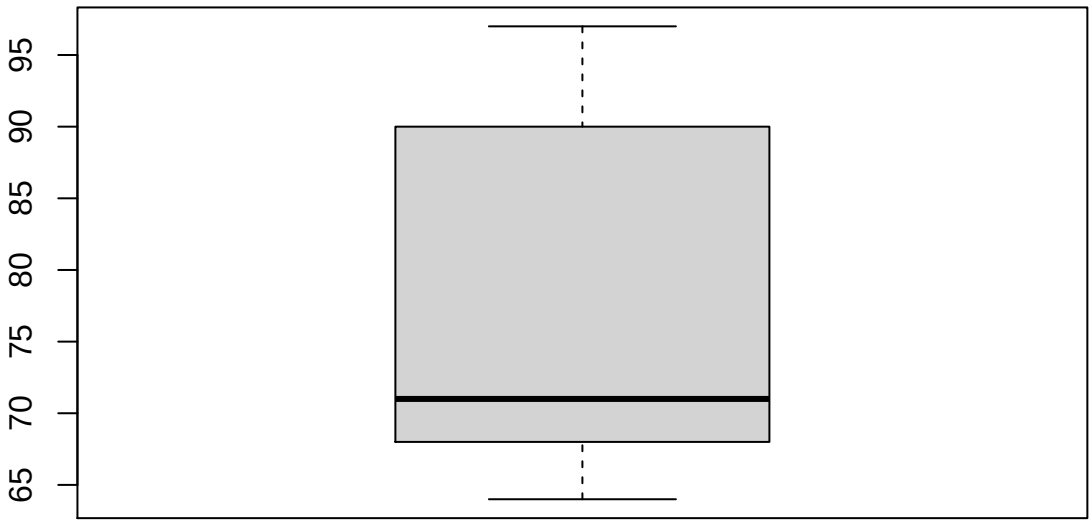
In the above chunk, I saved the data in new object and then performed operations on that. I named the percentage calculations according to order that we needed to compute them. The corresponding percentages were as follows:

60-65 = 4% 65-70 = 36% 70-75 = 16% 75-80 = 0% 80-85 = 0% 85-90 = 16% 90-95 = 20% 95-100 = 8%

total percentage = 4+36+16+0+0+16+20+8 = 100.

Part G is in the following chunk:

```r
boxplot(BMI) # Using the base R boxplot function.
```


95
90
85
80
75
70
65