Worksheet#5

Junmar Mahipus BSIT-2A

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#1) #a.
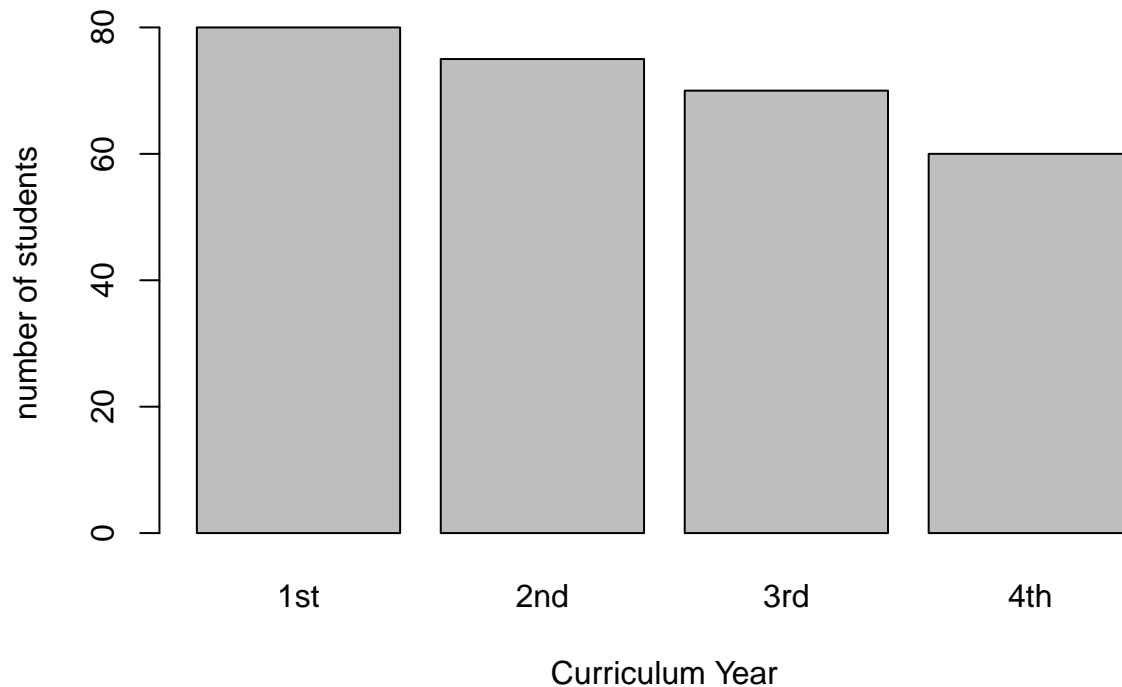
```
bc2019_2020 <- c(80, 75, 70, 60)
barplot
```

```
## function (height, ...)
## UseMethod("barplot")
## <bytecode: 0x000001bd4a11bbe0>
## <environment: namespace:graphics>
```

#b.

```
barplot(bc2019_2020,
        main= "Enrollment of BS Computer Science",
        xlab= "Curriculum Year",
        ylab= "number of students", names.arg= c("1st", "2nd", "3rd", "4th"))
```

Enrollment of BS Computer Science

#2)

#a.

```r
Monthlyincome_Dejesus <- data.frame(Food= ("60%"), Electricity= ("10%"),
                                    Savings= ("5%"), Other_miscellaneous_expenses= ("25%"))
Monthlyincome_Dejesus
```

```
##   Food Electricity Savings Other_miscellaneous_expenses
## 1  60%          10%      5%                          25%
```

#b.

```r
Monthlyincome_Dejesus <- c(60, 10, 5, 25)
Monthlyincome_Dejesus
```

```
## [1] 60 10  5 25
```

```r
pie(Monthlyincome_Dejesus,
    main= "cost",
    col= rainbow(length(Monthlyincome_Dejesus)),
    labels= c("Food", "Electricity", "Savings", "Other miscellaneous expenses"))
legend("topright", c("Food", "Electricity", "Savings", "Other miscellaneous expenses"),
       cex= 0.5, fill= rainbow(length(Monthlyincome_Dejesus)))
```

cost
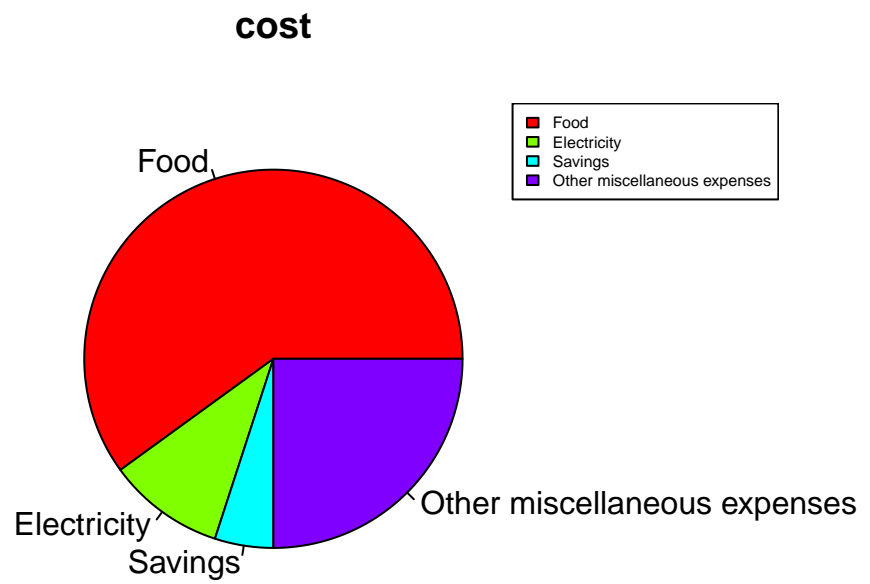
#3)

```
data(mtcars)
```

#a.

```
simple_histo <- (mtcars$mpg)
hist(simple_histo,)
```

Histogram of simple_histo

#b.
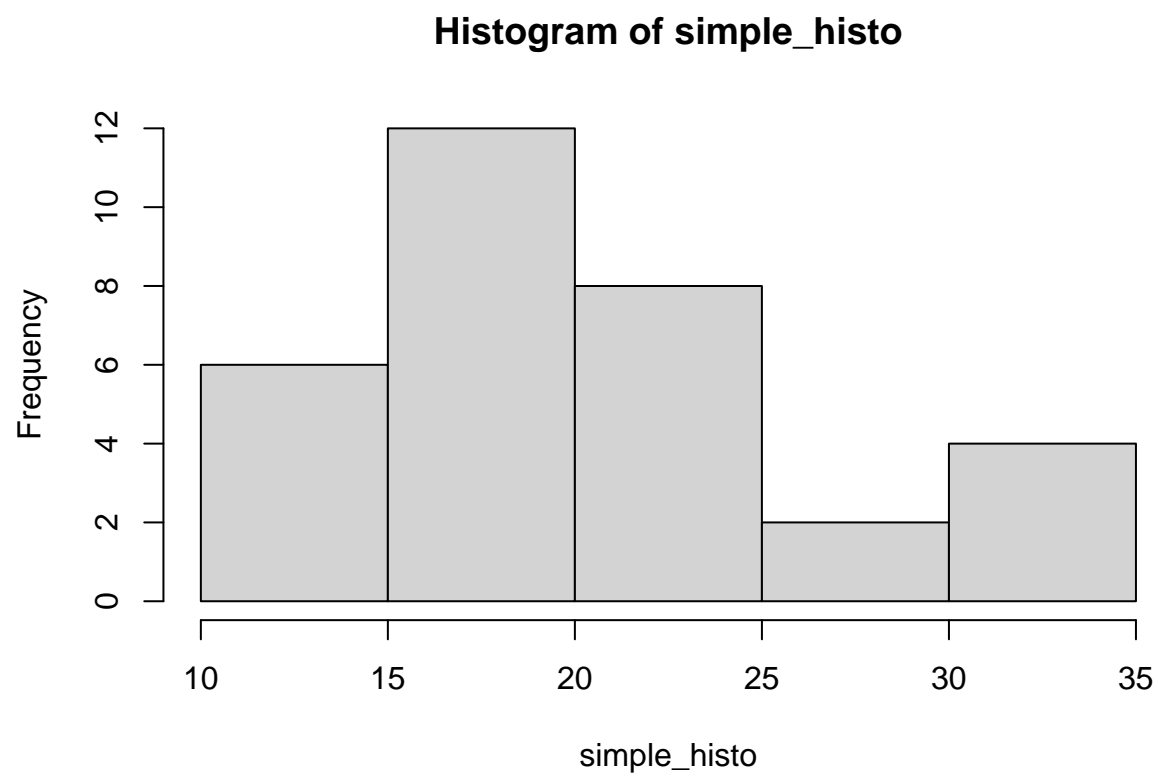
```r
hist(simple_histo, breaks=12, col="red")
```

Histogram of simple_histo
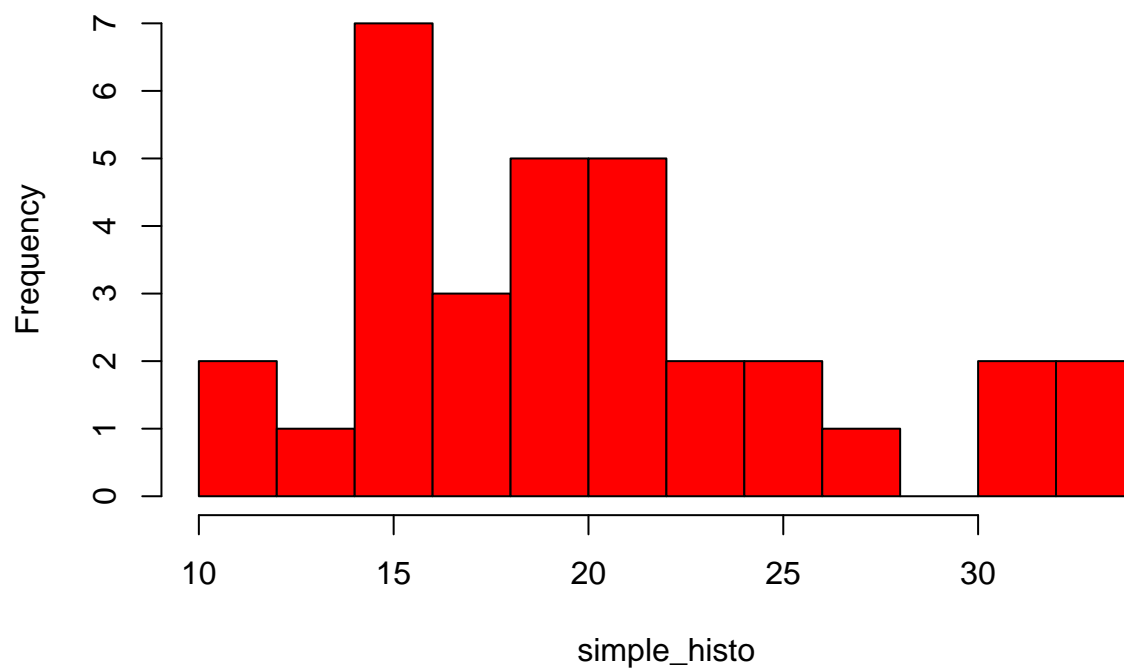
#c.

```
histo <-hist(simple_histo, breaks=10, col="red", xlab="Miles Per Gallon",
             main="Histogram with Normal Curve")
xfit<-seq(min(simple_histo),max(simple_histo),length=40)
yfit<-dnorm(xfit,mean=mean(simple_histo),sd=sd(simple_histo))
yfit <- yfit*diff(histo$mids[1:2])*length(simple_histo)
lines(xfit, yfit, col="blue", lwd=2)
```

Histogram with Normal Curve
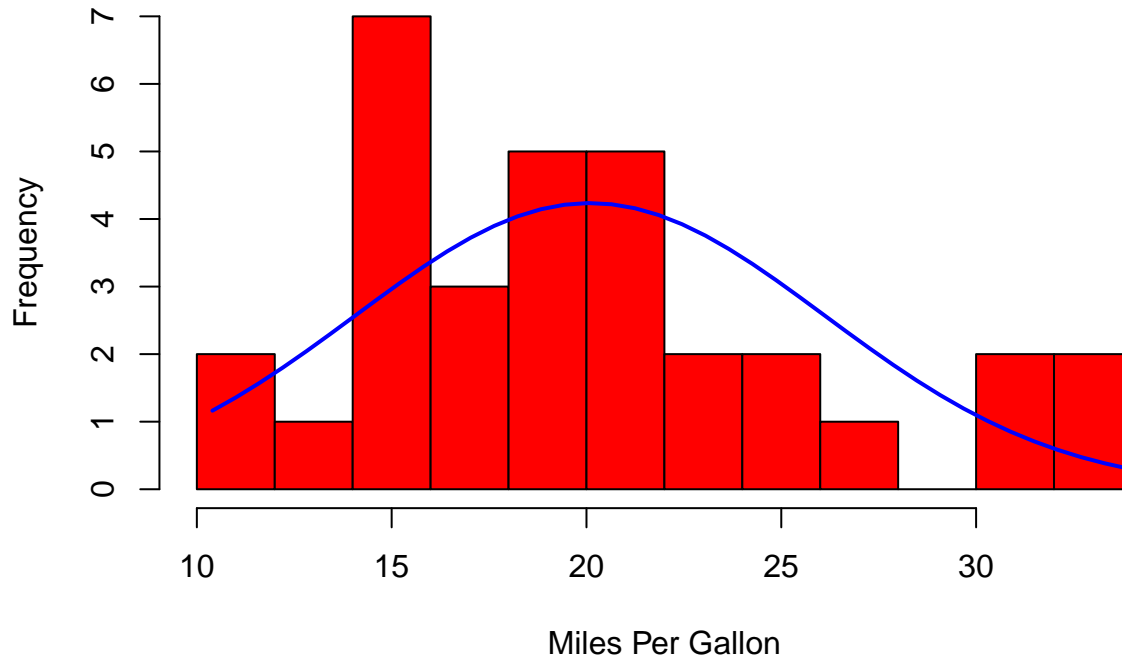
#4)

```
data(iris)
View(iris)
```

#a.

```
data_set1<- subset(iris, Species == "setosa")
data_set2<- subset(iris, Species == "versicolor")
data_set3<- subset(iris, Species == "virginica")
data_set1
```

```
##    Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 1           5.1         3.5          1.4         0.2  setosa
## 2           4.9         3.0          1.4         0.2  setosa
## 3           4.7         3.2          1.3         0.2  setosa
## 4           4.6         3.1          1.5         0.2  setosa
## 5           5.0         3.6          1.4         0.2  setosa
## 6           5.4         3.9          1.7         0.4  setosa
## 7           4.6         3.4          1.4         0.3  setosa
## 8           5.0         3.4          1.5         0.2  setosa
## 9           4.4         2.9          1.4         0.2  setosa
## 10          4.9         3.1          1.5         0.1  setosa
## 11          5.4         3.7          1.5         0.2  setosa
## 12          4.8         3.4          1.6         0.2  setosa
## 13          4.8         3.0          1.4         0.1  setosa
```

```
## 14           4.3          3.0          1.1          0.1   setosa
## 15           5.8          4.0          1.2          0.2   setosa
## 16           5.7          4.4          1.5          0.4   setosa
## 17           5.4          3.9          1.3          0.4   setosa
## 18           5.1          3.5          1.4          0.3   setosa
## 19           5.7          3.8          1.7          0.3   setosa
## 20           5.1          3.8          1.5          0.3   setosa
## 21           5.4          3.4          1.7          0.2   setosa
## 22           5.1          3.7          1.5          0.4   setosa
## 23           4.6          3.6          1.0          0.2   setosa
## 24           5.1          3.3          1.7          0.5   setosa
## 25           4.8          3.4          1.9          0.2   setosa
## 26           5.0          3.0          1.6          0.2   setosa
## 27           5.0          3.4          1.6          0.4   setosa
## 28           5.2          3.5          1.5          0.2   setosa
## 29           5.2          3.4          1.4          0.2   setosa
## 30           4.7          3.2          1.6          0.2   setosa
## 31           4.8          3.1          1.6          0.2   setosa
## 32           5.4          3.4          1.5          0.4   setosa
## 33           5.2          4.1          1.5          0.1   setosa
## 34           5.5          4.2          1.4          0.2   setosa
## 35           4.9          3.1          1.5          0.2   setosa
## 36           5.0          3.2          1.2          0.2   setosa
## 37           5.5          3.5          1.3          0.2   setosa
## 38           4.9          3.6          1.4          0.1   setosa
## 39           4.4          3.0          1.3          0.2   setosa
## 40           5.1          3.4          1.5          0.2   setosa
## 41           5.0          3.5          1.3          0.3   setosa
## 42           4.5          2.3          1.3          0.3   setosa
## 43           4.4          3.2          1.3          0.2   setosa
## 44           5.0          3.5          1.6          0.6   setosa
## 45           5.1          3.8          1.9          0.4   setosa
## 46           4.8          3.0          1.4          0.3   setosa
## 47           5.1          3.8          1.6          0.2   setosa
## 48           4.6          3.2          1.4          0.2   setosa
## 49           5.3          3.7          1.5          0.2   setosa
## 50           5.0          3.3          1.4          0.2   setosa
```

data_set2

```
##      Sepal.Length Sepal.Width Petal.Length Petal.Width      Species
## 51           7.0          3.2          4.7          1.4 versicolor
## 52           6.4          3.2          4.5          1.5 versicolor
## 53           6.9          3.1          4.9          1.5 versicolor
## 54           5.5          2.3          4.0          1.3 versicolor
## 55           6.5          2.8          4.6          1.5 versicolor
## 56           5.7          2.8          4.5          1.3 versicolor
## 57           6.3          3.3          4.7          1.6 versicolor
## 58           4.9          2.4          3.3          1.0 versicolor
## 59           6.6          2.9          4.6          1.3 versicolor
## 60           5.2          2.7          3.9          1.4 versicolor
## 61           5.0          2.0          3.5          1.0 versicolor
## 62           5.9          3.0          4.2          1.5 versicolor
## 63           6.0          2.2          4.0          1.0 versicolor
```

```
## 64            6.1           2.9           4.7          1.4 versicolor
## 65            5.6           2.9           3.6          1.3 versicolor
## 66            6.7           3.1           4.4          1.4 versicolor
## 67            5.6           3.0           4.5          1.5 versicolor
## 68            5.8           2.7           4.1          1.0 versicolor
## 69            6.2           2.2           4.5          1.5 versicolor
## 70            5.6           2.5           3.9          1.1 versicolor
## 71            5.9           3.2           4.8          1.8 versicolor
## 72            6.1           2.8           4.0          1.3 versicolor
## 73            6.3           2.5           4.9          1.5 versicolor
## 74            6.1           2.8           4.7          1.2 versicolor
## 75            6.4           2.9           4.3          1.3 versicolor
## 76            6.6           3.0           4.4          1.4 versicolor
## 77            6.8           2.8           4.8          1.4 versicolor
## 78            6.7           3.0           5.0          1.7 versicolor
## 79            6.0           2.9           4.5          1.5 versicolor
## 80            5.7           2.6           3.5          1.0 versicolor
## 81            5.5           2.4           3.8          1.1 versicolor
## 82            5.5           2.4           3.7          1.0 versicolor
## 83            5.8           2.7           3.9          1.2 versicolor
## 84            6.0           2.7           5.1          1.6 versicolor
## 85            5.4           3.0           4.5          1.5 versicolor
## 86            6.0           3.4           4.5          1.6 versicolor
## 87            6.7           3.1           4.7          1.5 versicolor
## 88            6.3           2.3           4.4          1.3 versicolor
## 89            5.6           3.0           4.1          1.3 versicolor
## 90            5.5           2.5           4.0          1.3 versicolor
## 91            5.5           2.6           4.4          1.2 versicolor
## 92            6.1           3.0           4.6          1.4 versicolor
## 93            5.8           2.6           4.0          1.2 versicolor
## 94            5.0           2.3           3.3          1.0 versicolor
## 95            5.6           2.7           4.2          1.3 versicolor
## 96            5.7           3.0           4.2          1.2 versicolor
## 97            5.7           2.9           4.2          1.3 versicolor
## 98            6.2           2.9           4.3          1.3 versicolor
## 99            5.1           2.5           3.0          1.1 versicolor
## 100           5.7           2.8           4.1          1.3 versicolor
```

data_set3

```
##     Sepal.Length Sepal.Width Petal.Length Petal.Width   Species
## 101          6.3         3.3          6.0         2.5 virginica
## 102          5.8         2.7          5.1         1.9 virginica
## 103          7.1         3.0          5.9         2.1 virginica
## 104          6.3         2.9          5.6         1.8 virginica
## 105          6.5         3.0          5.8         2.2 virginica
## 106          7.6         3.0          6.6         2.1 virginica
## 107          4.9         2.5          4.5         1.7 virginica
## 108          7.3         2.9          6.3         1.8 virginica
## 109          6.7         2.5          5.8         1.8 virginica
## 110          7.2         3.6          6.1         2.5 virginica
## 111          6.5         3.2          5.1         2.0 virginica
## 112          6.4         2.7          5.3         1.9 virginica
## 113          6.8         3.0          5.5         2.1 virginica
```

```
## 114            5.7           2.5           5.0           2.0 virginica
## 115            5.8           2.8           5.1           2.4 virginica
## 116            6.4           3.2           5.3           2.3 virginica
## 117            6.5           3.0           5.5           1.8 virginica
## 118            7.7           3.8           6.7           2.2 virginica
## 119            7.7           2.6           6.9           2.3 virginica
## 120            6.0           2.2           5.0           1.5 virginica
## 121            6.9           3.2           5.7           2.3 virginica
## 122            5.6           2.8           4.9           2.0 virginica
## 123            7.7           2.8           6.7           2.0 virginica
## 124            6.3           2.7           4.9           1.8 virginica
## 125            6.7           3.3           5.7           2.1 virginica
## 126            7.2           3.2           6.0           1.8 virginica
## 127            6.2           2.8           4.8           1.8 virginica
## 128            6.1           3.0           4.9           1.8 virginica
## 129            6.4           2.8           5.6           2.1 virginica
## 130            7.2           3.0           5.8           1.6 virginica
## 131            7.4           2.8           6.1           1.9 virginica
## 132            7.9           3.8           6.4           2.0 virginica
## 133            6.4           2.8           5.6           2.2 virginica
## 134            6.3           2.8           5.1           1.5 virginica
## 135            6.1           2.6           5.6           1.4 virginica
## 136            7.7           3.0           6.1           2.3 virginica
## 137            6.3           3.4           5.6           2.4 virginica
## 138            6.4           3.1           5.5           1.8 virginica
## 139            6.0           3.0           4.8           1.8 virginica
## 140            6.9           3.1           5.4           2.1 virginica
## 141            6.7           3.1           5.6           2.4 virginica
## 142            6.9           3.1           5.1           2.3 virginica
## 143            5.8           2.7           5.1           1.9 virginica
## 144            6.8           3.2           5.9           2.3 virginica
## 145            6.7           3.3           5.7           2.5 virginica
## 146            6.7           3.0           5.2           2.3 virginica
## 147            6.3           2.5           5.0           1.9 virginica
## 148            6.5           3.0           5.2           2.0 virginica
## 149            6.2           3.4           5.4           2.3 virginica
## 150            5.9           3.0           5.1           1.8 virginica
```

#b.

```
setosa <- colMeans(data_set1[sapply(data_set1,is.numeric)])
versicolor <- colMeans(data_set2[sapply(data_set2,is.numeric)])
virginica <- colMeans(data_set3[sapply(data_set3,is.numeric)])
setosa
```

```
## Sepal.Length  Sepal.Width Petal.Length  Petal.Width
##        5.006        3.428        1.462        0.246
```

```
versicolor
```

```
## Sepal.Length  Sepal.Width Petal.Length  Petal.Width
##        5.936        2.770        4.260        1.326
```

virginica

```
## Sepal.Length   Sepal.Width Petal.Length   Petal.Width
##        6.588         2.974        5.552         2.026
```

#c.

```r
species21 <- rbind(setosa, versicolor, virginica)
species21
```

```
##            Sepal.Length Sepal.Width Petal.Length Petal.Width
## setosa            5.006       3.428        1.462       0.246
## versicolor        5.936       2.770        4.260       1.326
## virginica         6.588       2.974        5.552       2.026
```

#d.

```r
barplot(species21, beside = TRUE,
        main = "Iris Mean",
        xlab = "Characteristics",
        ylab = "Mean Scores",
        col = c("red","green","blue"))
```