

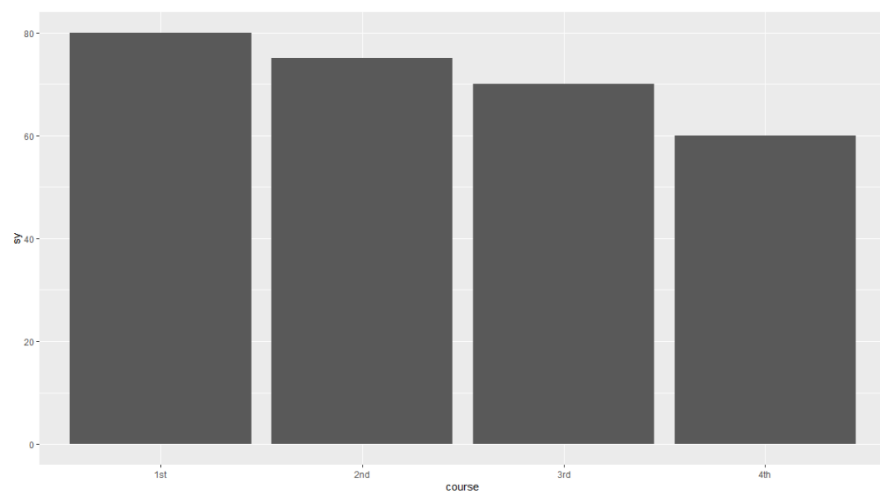
WORKSHEET 5

1. A.

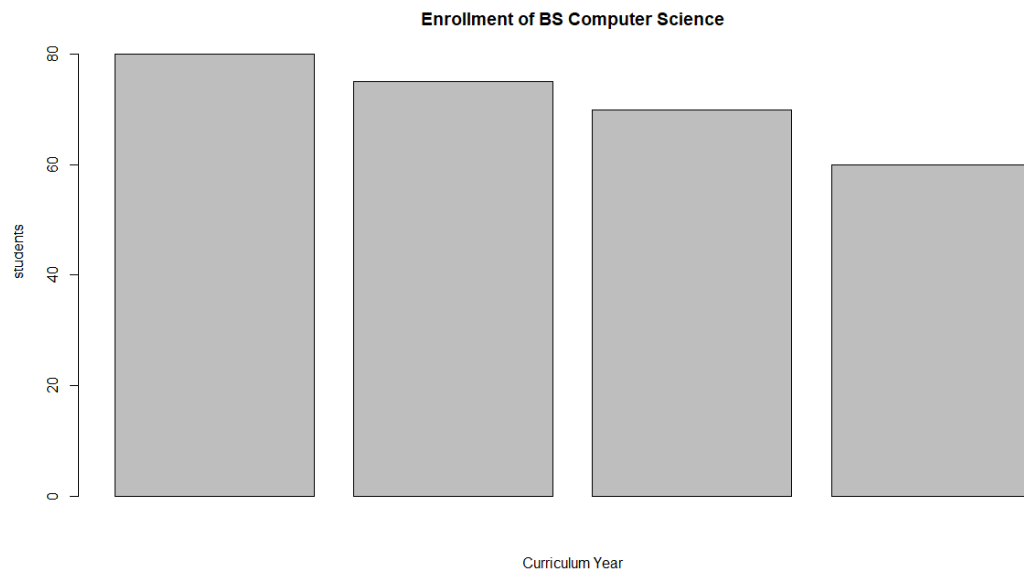
Code: `df <- data.frame("course"=c("1st", "2nd", "3rd", "4th"), "sy"= c(80, 75, 70, 60))`

`ggplot(df) + geom_col(aes(course, sy))`

Result:



B.



2. A.Code: `food <- 60`
`electricity <- 10`
`savings <- 5`
`misc <- 25`

```
expenses <- data.frame(food, electricity, savings, misc)
expenses
```

Result:

B. Code: `expense <- c(60`

`pie(expense, main = "Ex`

`labels = c("food", "electricity", "savings", "misc"))`

`expense_label <- round(expense/sum(expense) * 100, 1)`

`expense_label <- paste(expense_label, "%", sep = "")`

`pie(expense, main = "Expenses", col = rainbow(length(expense)),`

`labels = expense_label, cex=0.8)`

`legend(1, c("food", "electricity", "savings", "misc"),`

`cex = 0.8, fill = rainbow(length(expense)))`

Result:

Expenses

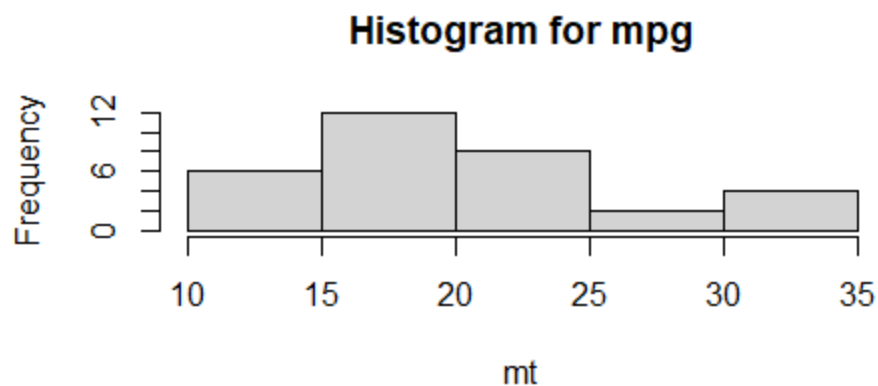


3. A.

Code: `mt <- mtcars$mpg`

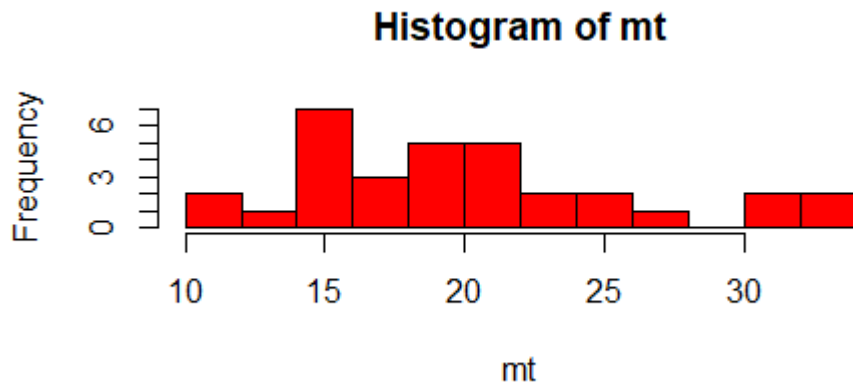
`hist(mt, main = "Histogram for mpg")`

Result:

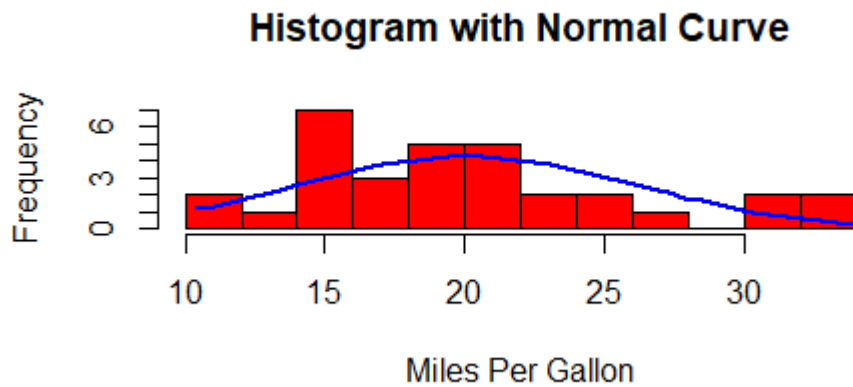


B. Code: `hist(mt, breaks=12, col="red")`

Result:



C. Result:



4. A. Code:

```
data("iris")
```

```
data_a <- data.frame(iris)
```

```
data_a
```

```
a_data <- subset(data_a, Species == 'setosa')
```

```
a_data
```

```
data_b <- data.frame(iris)
```

```
data_b
```

```
b_data <- subset(data_b, Species == 'versicolor')
b_data
```

```
data_c <- data.frame(iris)
data_c
c_data <- subset(data_c, Species == 'virginica')
c_data
```

B. Code:

```
setosa <- colMeans(a_data[sapply(a_data,is.numeric)])
setosa
```

```
versicolor <- colMeans(b_data[sapply(b_data,is.numeric)])
versicolor
```

```
virginica <- colMeans(c_data[sapply(c_data,is.numeric)])
virginica
```

Result:

```
150      5.9      3.0      5.1      1.8 virginica
> setosa <- colMeans(a_data[sapply(a_data,is.numeric)])
> setosa
Sepal.Length Sepal.Width Petal.Length  Petal.Width
      5.006      3.428      1.462      0.246
>
> versicolor <- colMeans(b_data[sapply(b_data,is.numeric)])
> versicolor
Sepal.Length Sepal.Width Petal.Length  Petal.Width
      5.936      2.770      4.260      1.326
>
> virginica <- colMeans(c_data[sapply(c_data,is.numeric)])
> virginica
Sepal.Length Sepal.Width Petal.Length  Petal.Width
      6.588      2.974      5.552      2.026
> |
```

C. Result:

```
> sec
      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. Code: `barplot(sec, beside =TRUE, main = "Iris Mean",
xlab = "Characteristics", ylab = "Mean Scores",
col = c("red", "green", "blue"))`

Result:

