Kirsten Fure – 7/19/2019

<u>R Code:</u>

```
Setwd(" ")
save.image(file = 'Lab2_myFile.Rdata')
install.packages("VIM")
library(VIM)
install.packages("mice")
library(mice)
library(datasets)
data(iris)
head(iris)
summary(iris)
nrow(iris)
md.pattern(iris)
nrow(iris[!complete.cases(iris),])
boxplot(Petal.Length~Species, data=iris, col="pink", main="Iris
 Species by Petal Length", ylab = "Petal Length", xlab = "Iris
 Species")
boxplot(Petal.Width~Species, data=iris, col="purple", main="Iris
Species by Petal Width", ylab = "Petal Width", xlab = "Iris
Species")
install.packages("vioplot")
library(vioplot)

v1 = iris$Petal.Length[iris$Species == "setosa"]
v2 = iris$Petal.Length[iris$Species == "versicolor"]
v3 = iris$Petal.Length[iris$Species == "virginica"]
vioplot(v1, v2, v3, names = c("Setosa", "Versicolor",
"Virginica"), col=c("lightgreen", "lightblue", "palevioletred"),
main = "Iris Species by Petal Length")

v1 = iris$Petal.Width[iris$Species == "setosa"]
v2 = iris$Petal.Width[iris$Species == "versicolor"]
v3 = iris$Petal.Width[iris$Species == "virginica"]

vioplot(v1, v2, v3, names = c("Setosa", "Versicolor",
"Virginica"), col=c("lightgreen", "lightblue", "palevioletred"),
main = "Iris Species by Petal Width")
```

plot(Petal.Length ~Petal.Width, data = iris, col="blue", main = `"Scatter Plot of`

```
Petal Size", ylab = "Petal Length", xlab = "Petal Width")
```

Screen Output ScreenShot:

```
> library(datasets)
> data(iris)
> head(iris)
  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
> summary(iris)
  Sepal.Length    Sepal.Width     Petal.Length    Petal.Width          Species
 Min.   :4.300   Min.   :2.000   Min.   :1.000   Min.   :0.100   setosa    :50
 1st Qu.:5.100   1st Qu.:2.800   1st Qu.:1.600   1st Qu.:0.300   versicolor:50
 Median :5.800   Median :3.000   Median :4.350   Median :1.300   virginica :50
 Mean   :5.843   Mean   :3.057   Mean   :3.758   Mean   :1.199
 3rd Qu.:6.400   3rd Qu.:3.300   3rd Qu.:5.100   3rd Qu.:1.800
 Max.   :7.900   Max.   :4.400   Max.   :6.900   Max.   :2.500
> nrow(iris)
[1] 150
> md.pattern(iris)
  /\     /\
 {  `---'  }
 {  0   0  }
 ==>  V <==  No need for mice. This data set is completely observed.
  \  \|/  /
   `-----'

    Sepal.Length Sepal.Width Petal.Length Petal.Width Species
150            1           1            1           1       1 0
               0           0            0           0       0 0
> nrow(iris[!complete.cases(iris),])
[1] 0
```

```
> boxplot(Petal.Length~Species, data=iris, col="pink", main="Iris Species by Petal Length", ylab = "Petal Length", xlab = "Iris Species")
> boxplot(Petal.Width~Species, data=iris, col="purple", main="Iris Species by Petal Width", ylab = "Petal Width", xlab = "Iris Species")
>
```

Iris Species by Petal Length

Iris Species by Petal Width
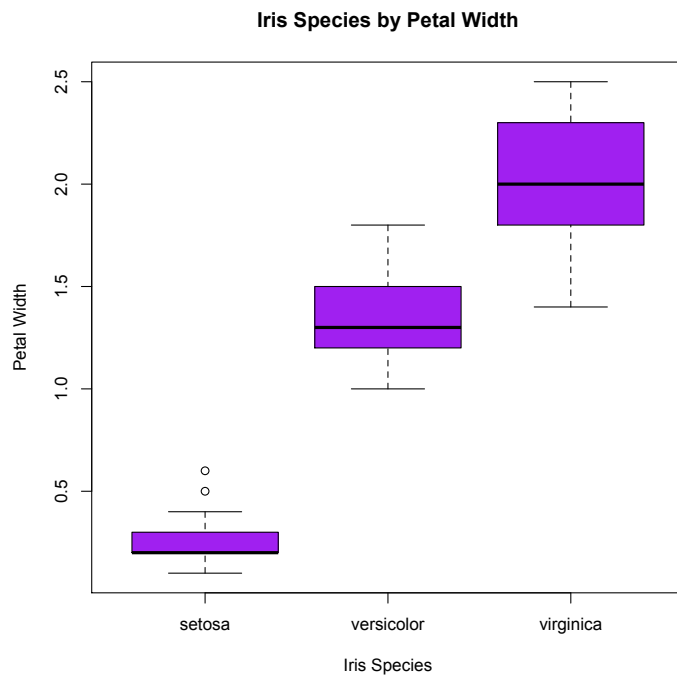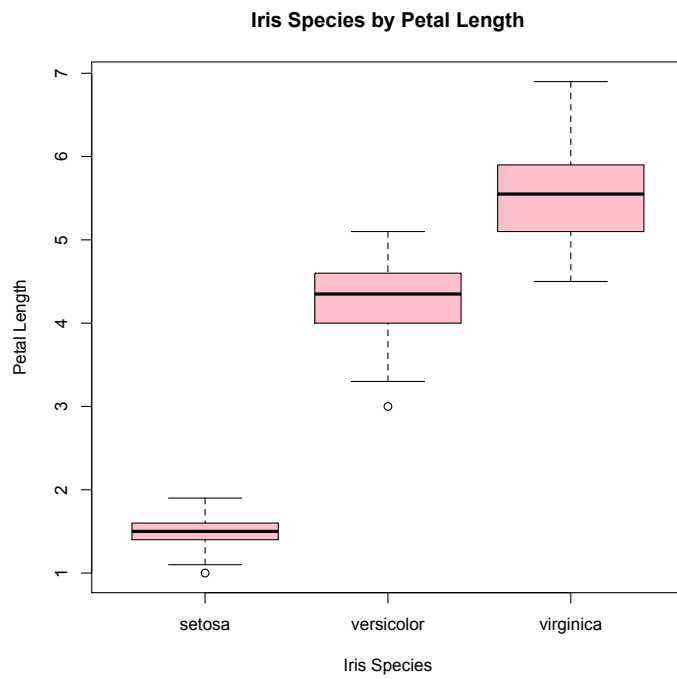
These boxplots show how Petal Size can help categorize the species of iris.

```
> install.packages("vioplot")
Installing package into '/Users/kirsten 1/Library/R/3.6/library'
(as 'lib' is unspecified)
trying URL 'https://cran.cnr.berkeley.edu/bin/macosx/el-capitan/contrib/3.6/vioplot_0.3.2.tgz'
Content type 'application/x-gzip' length 836257 bytes (816 KB)
==================================================
downloaded 816 KB


The downloaded binary packages are in
    /var/folders/cl/1l5wpk_s6xxf5kb67qx2gbdw0000gp/T//RtmpdrGMSf/downloaded_packages
> library(vioplot)
> v1 = iris$Petal.Length[iris$Species == "setosa"]
```

```
> v1 = iris$Petal.Length[iris$Species == "setosa"]
> v2 = iris$Petal.Length[iris$Species == "versicolor"]
> v3 = iris$Petal.Length[iris$Species == "virginica"]
> vioplot(v1, v2, v3, names = c("Setosa", "Versicolor", "Virginica"), col=c("lightgreen", "lightblue", "palevioletred"), main = "Iris Species by Petal Length")
[1] 1.0 6.9
```

```
> v1 = iris$Petal.Width[iris$Species == "setosa"]
> v2 = iris$Petal.Width[iris$Species == "versicolor"]
> v3 = iris$Petal.Width[iris$Species == "virginica"]
> vioplot(v1, v2, v3, names = c("Setosa", "Versicolor", "Virginica"), col=c("lightgreen", "lightblue", "palevioletred"), main = "Iris Species by Petal Width")
[1] 0.1 2.5
```


Iris Species by Petal Length

Iris Species by Petal Width
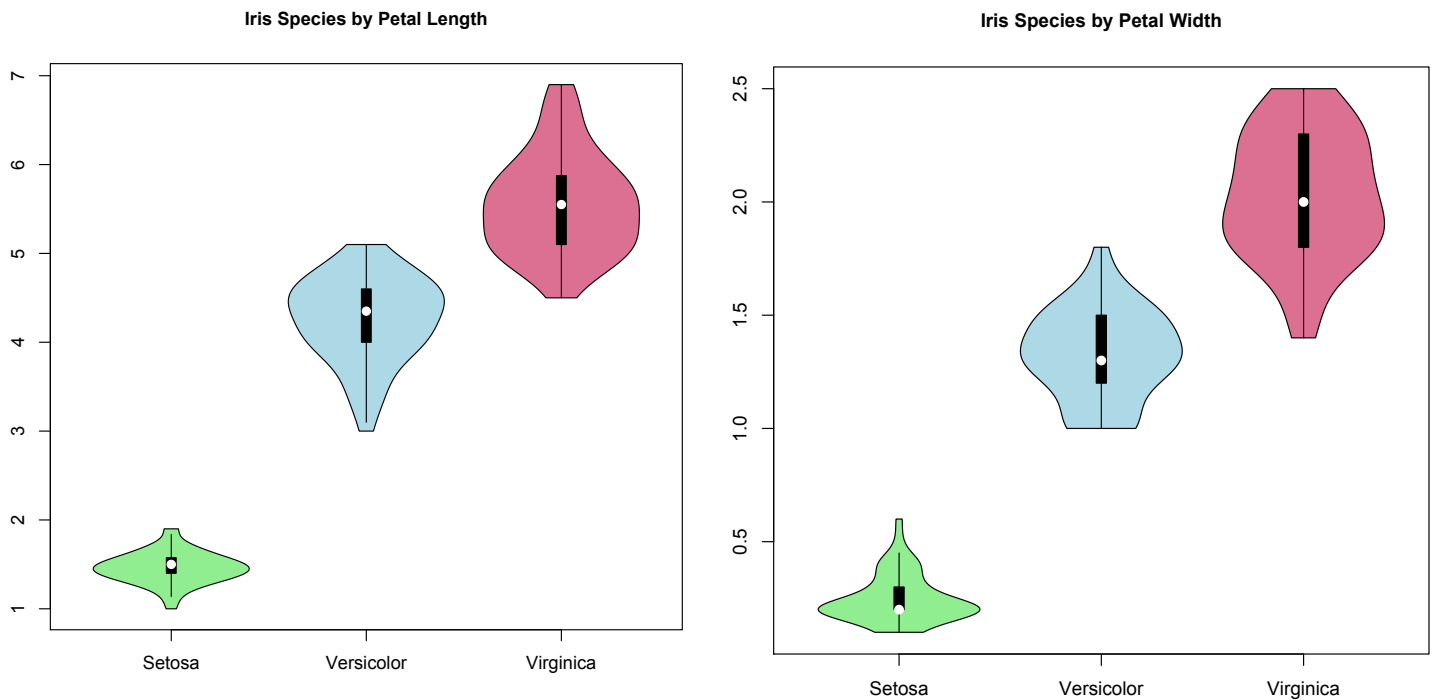
These violin plots show how Petal Size can help categorize the species of iris.
Only Setosa by Petal Length shows a fairly normal distribution curve. The others
have a tail, showing some skewed distribution among the values.

```
> plot(Petal.Length ~Petal.Width, data = iris, col="blue", main = "Scatter Plot of Petal Size",  ylab = "Petal Length", xlab = "Petal Width")
```

Scatter Plot of Petal Size
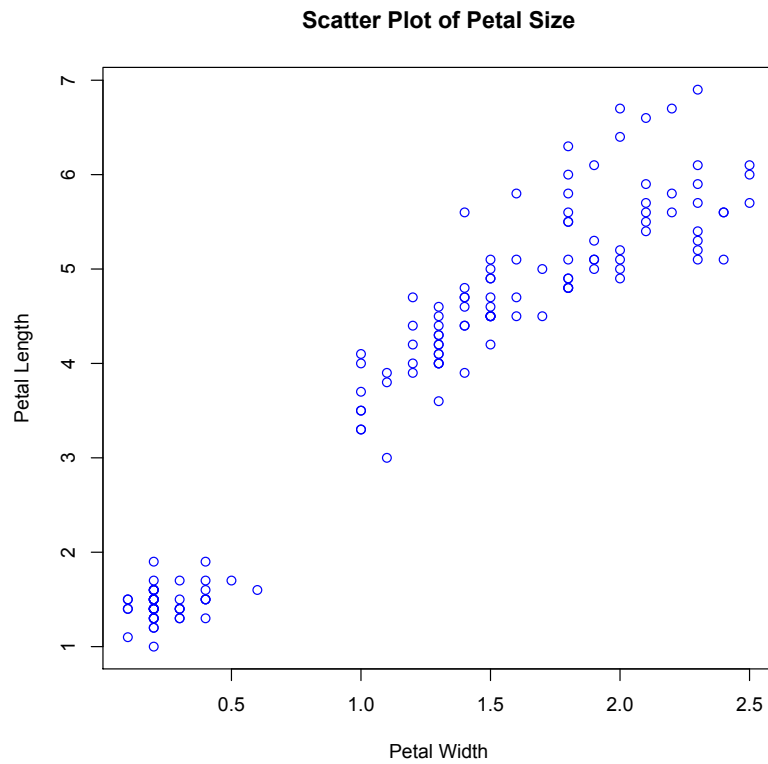
This scatter plot shows a positive correlation between Petal Length and Petal Width. (As petal width gets larger, so does petal length)

R Code:
```
IrisSpecs = iris[ , 1:4]
cor(IrisSpecs)
```


Screen Output ScreenShot:

```
> IrisSpecs = iris[ , 1:4]
> cor(IrisSpecs)
             Sepal.Length Sepal.Width Petal.Length Petal.Width
Sepal.Length    1.0000000  -0.1175698    0.8717538   0.8179411
Sepal.Width    -0.1175698   1.0000000   -0.4284401  -0.3661259
Petal.Length    0.8717538  -0.4284401    1.0000000   0.9628654
Petal.Width     0.8179411  -0.3661259    0.9628654   1.0000000
>
```

Petal Length to Petal Width has high correlation at .96.
Petal Length to Sepal Length also has a high correlation at .87.
Petal Width to Sepal Length also has a high correlation at .81.