Q10.R

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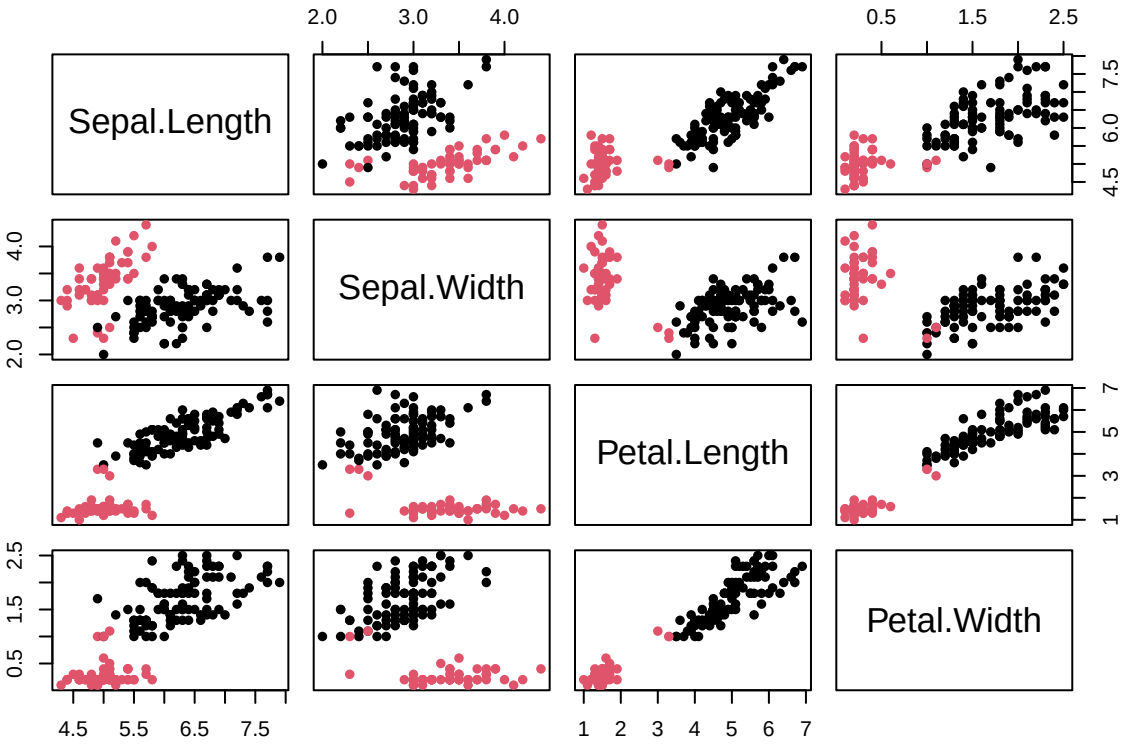
```r
head(iris)
```

```
##   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
```

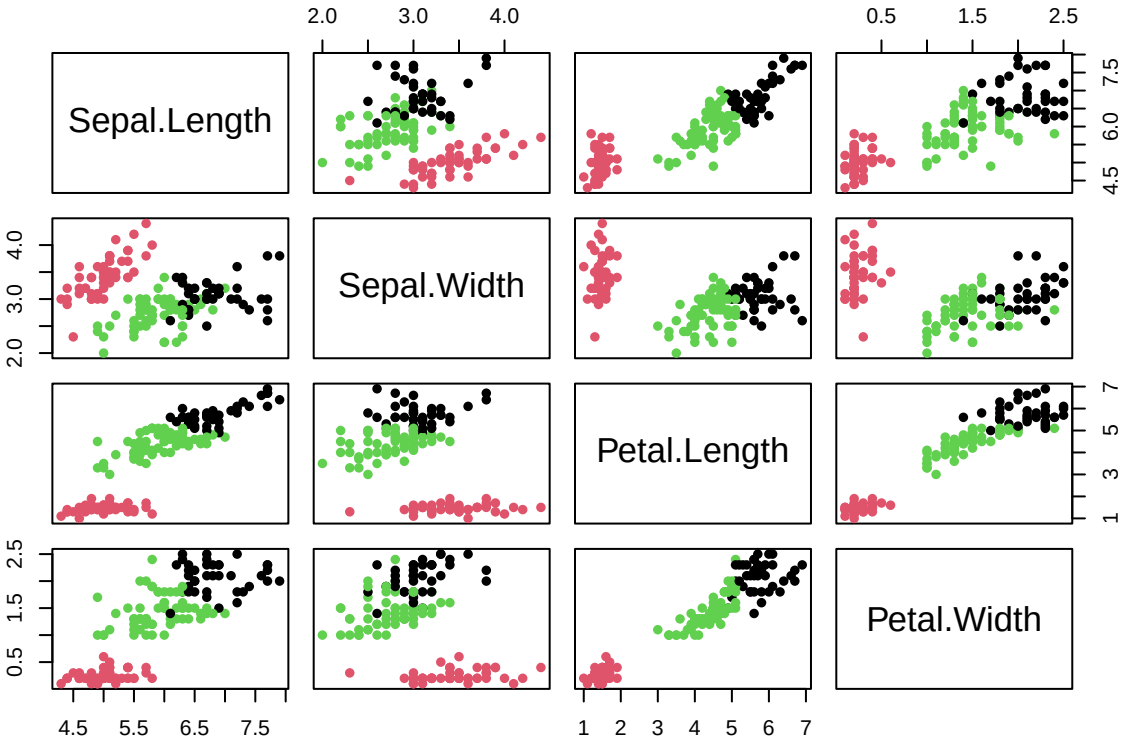
```r
df <- iris[1:4]
head(df)
```

```
##   Sepal.Length Sepal.Width Petal.Length Petal.Width
## 1          5.1         3.5          1.4         0.2
## 2          4.9         3.0          1.4         0.2
## 3          4.7         3.2          1.3         0.2
## 4          4.6         3.1          1.5         0.2
## 5          5.0         3.6          1.4         0.2
## 6          5.4         3.9          1.7         0.4
```

```r
# Fit k-means clustering model with k = 2
k2 <- kmeans(df, centers = 2)

# Fit k-means clustering model with k = 3
k3 <- kmeans(df, centers = 3)

# Cluster means and WSS for k = 2
k2_cluster_means <- k2$centers
k2_wss <- k2$tot.withinss

# Cluster means and WSS for k = 3
k3_cluster_means <- k3$centers
k3_wss <- k3$tot.withinss

# Plot for k = 2
plot(df, col = k2$cluster, pch = 16)
```

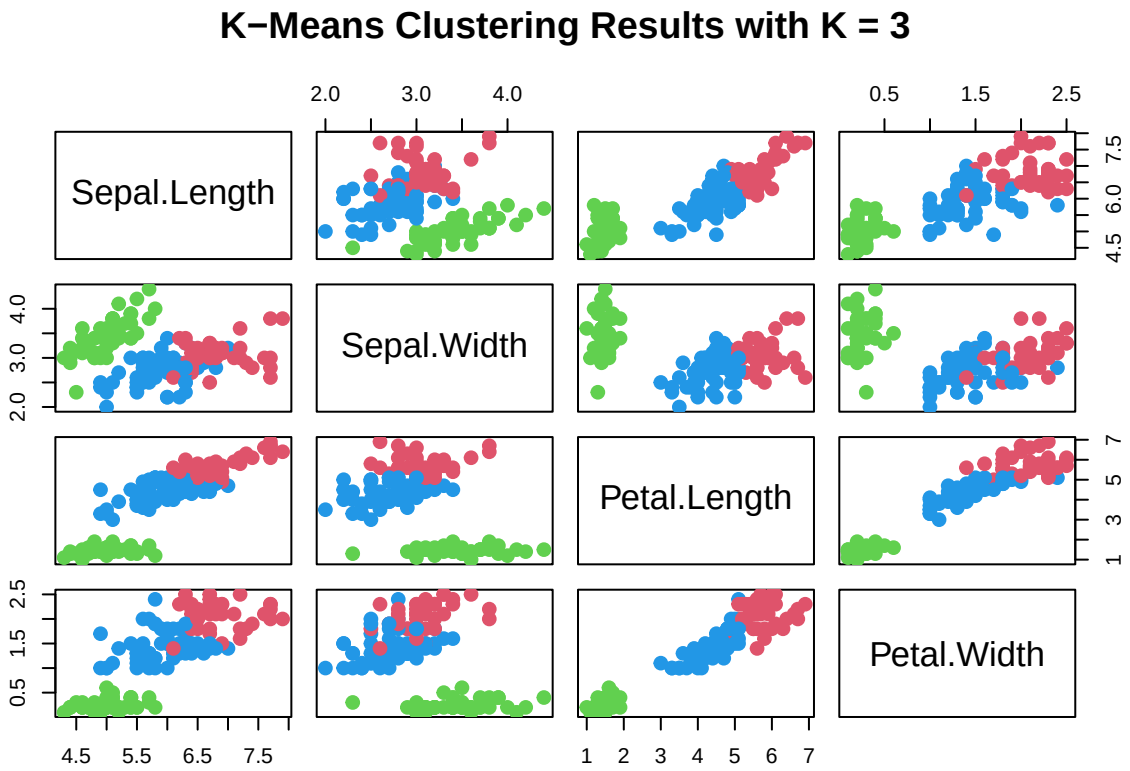



```
#the plot of iris with 4 first variable shows that the are two clusters in relation with other variable

# Plot for k = 3
plot(df, col = k3$cluster, pch = 16)
```

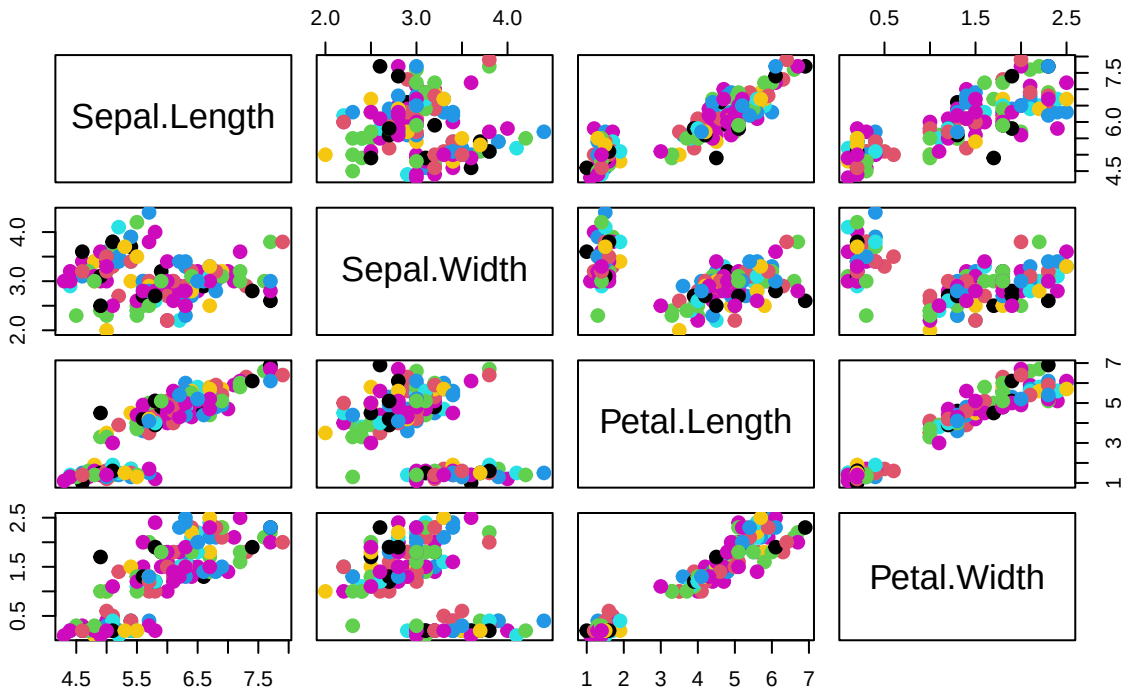



```
#here the plot of shows 3 clusters of data
```

```r
plot(df,      col = (k3$cluster + 1),
     main = "K-Means Clustering Results with K = 3",     pch = 20, cex = 2)
```




```r
#three cluster are found
plot(df, col=(k3$centers + 1), main = "K-means clustering results with centers of k = 3", pch = 20, cex=
```




```
#The three clusters with overlapping centre are formed
```