Report for lab assignment 2

1. Question: Prepare a dataset and perform k-means clustering.

Description:

Data set: Use the data from UC Irvine Machine Learning Repository.

Brief description:

It is an Iris Plants Database, which include 150 data sets.

There are four features:

1. sepal length in cm
2. sepal width in cm
3. petal length in cm
4. petal width in cm

Three classes:

-- Iris Setosa

-- Iris Versicolour

-- Iris Virginica

Code:

```
> Iris=read.csv("Desktop/Iris.csv")
> Iris.feature = Iris
> Iris.feature$class <- NULL
> results <- kmeans(Iris.feature, 3)
> results
```

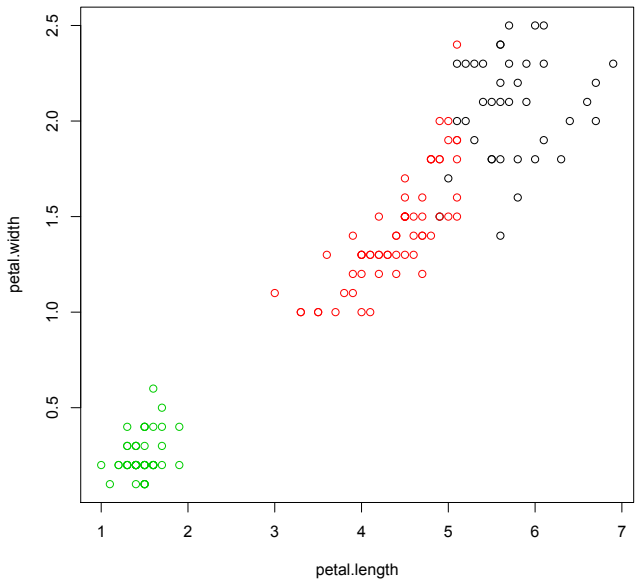
Results (I explain the results in green words, which are not from R)**:**

```
K-means clustering with 3 clusters of sizes 38, 62, 50 //Three classes are identified:
first cluster: 38; second cluster: 62; third cluster: 50

Cluster means:
  sepal.length sepal.width petal.length petal.width
1     6.850000  3.073684   5.742105  2.071053 //means of first cluster for each feature
2     5.901613  2.748387   4.393548  1.433871 //means of second cluster for each feature
3     5.006000  3.418000   1.464000  0.244000 //means of third cluster for each feature
```

```
Clustering vector:// which cluster the data belongs to. e.g. “3” means the value place
belongs to the third cluster.
  [1] 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
 [38] 3 3 3 3 3 3 3 3 3 3 3 3 3 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
 [75] 2 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 2 1 1 1 1 2 1 1 1 1
[112] 1 1 2 2 1 1 1 1 2 1 2 1 2 1 1 2 2 1 1 1 1 1 2 1 1 1 1 2 1 1 1 2 1 1 1 2 1
[149] 1 2

Within cluster sum of squares by cluster:// C = Σ(X^(i)-m_j)^2
[1] 23.87947 39.82097 15.24040
 (between_SS / total_SS =  88.4 %)

Available components:// The available components that can be obtained from this function

[1] "cluster"      "centers"      "totss"        "withinss"     "tot.withinss"
[6] "betweenss"    "size"         "iter"         "ifault"
```

More code:

```
>results$size //want to know the size of each cluster
38 62 50 // size results
> plot(Iris[c("petal.length", "petal.width")], col = results$cluster) //plot petal length
vs. petal width in each cluster
```



```
>table(Iris$class, results$cluster) //learning results (clusters) vs. data collected
                  1  2  3
  Iris-setosa     0  0 50
  Iris-versicolor 2 48  0
  Iris-virginica 36 14  0
```

Screenshots:

See graph attached above.

2. Question:

RoboMe and Watch App

Create a RoboMe and Watch App that uses weather or any API of choice.

Description:

I did two applications. One is using Google Map API and the other is using Yahoo Weather API.

1) Google Map API:

   Step 1. Install the Google Play services SDK

   Step 2. Create a Google Maps project

   Step 3. Get a Google Maps API key

2) Yahoo weather API:

   Key step:

```
String YQL = String.format("select * from weather.forecast where woeid in (select woeid from geo.places(1) where text=\"%s\") and u='c'", strings[0]);

String endpoint =
String.format("https://query.yahooapis.com/v1/public/yql?q=%s&format=json",
Uri.encode(YQL));
```

Screenshots:

Use Google Map API:

Use weather API: