Week 10 Mini Project Clustering

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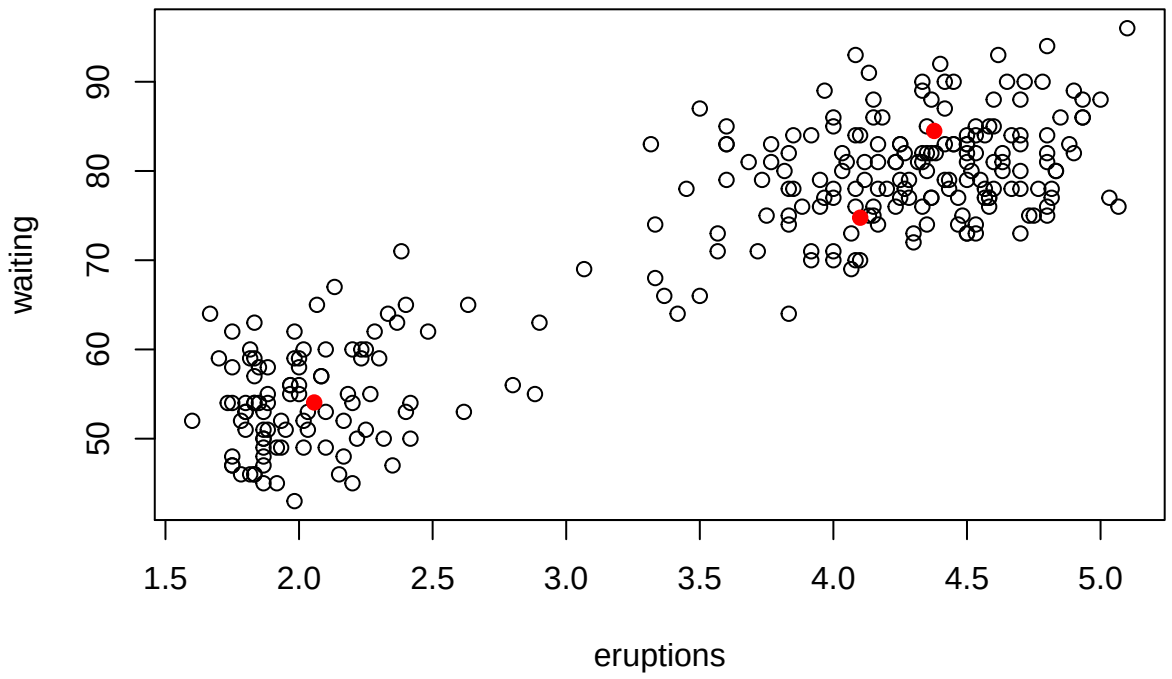
10/31/2015

This project will focus on taking data from the R package cluster.datasets nd performing a cluster analysis on the data. The first thing to do is setup the appropriate environment using the following.

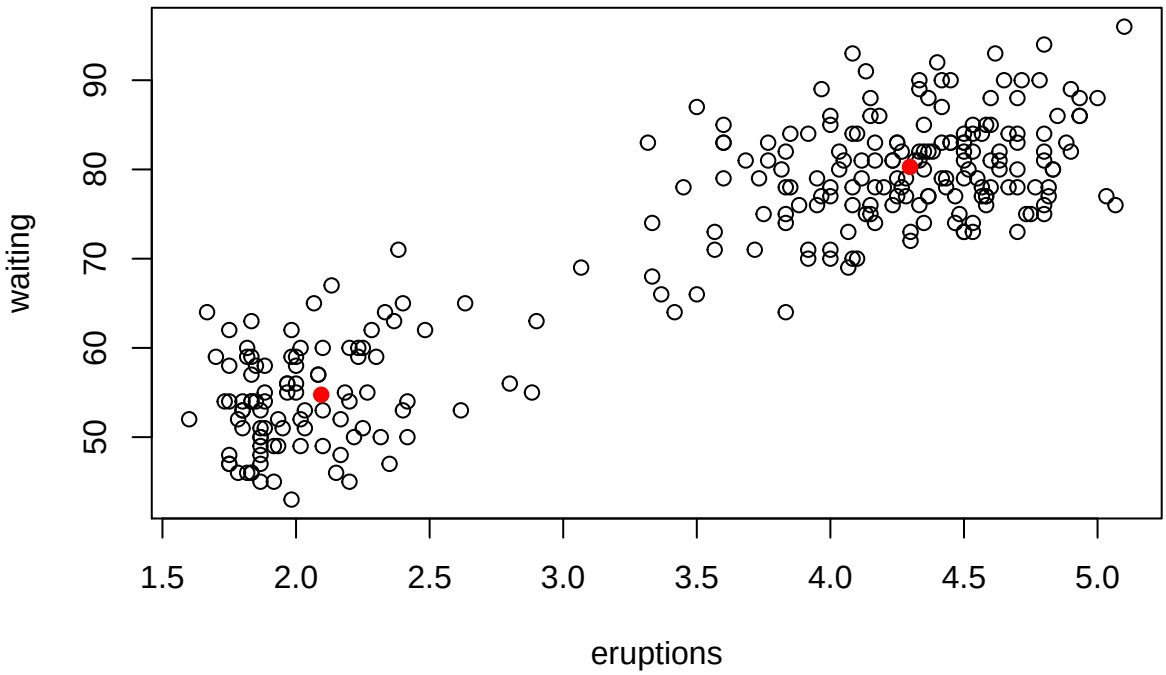
I am going to cluster waiting time between eruptions and the duration of eruptions for the Old Faithful geyser in Yellowstone. This dataset faithful is part of base R.

```
data <- faithful

kmeans.data<- kmeans(data, 3)

plot(data)
points(kmeans.data$centers, pch=19, col="red")
```



Looking at the initial datasets there are two clusters.

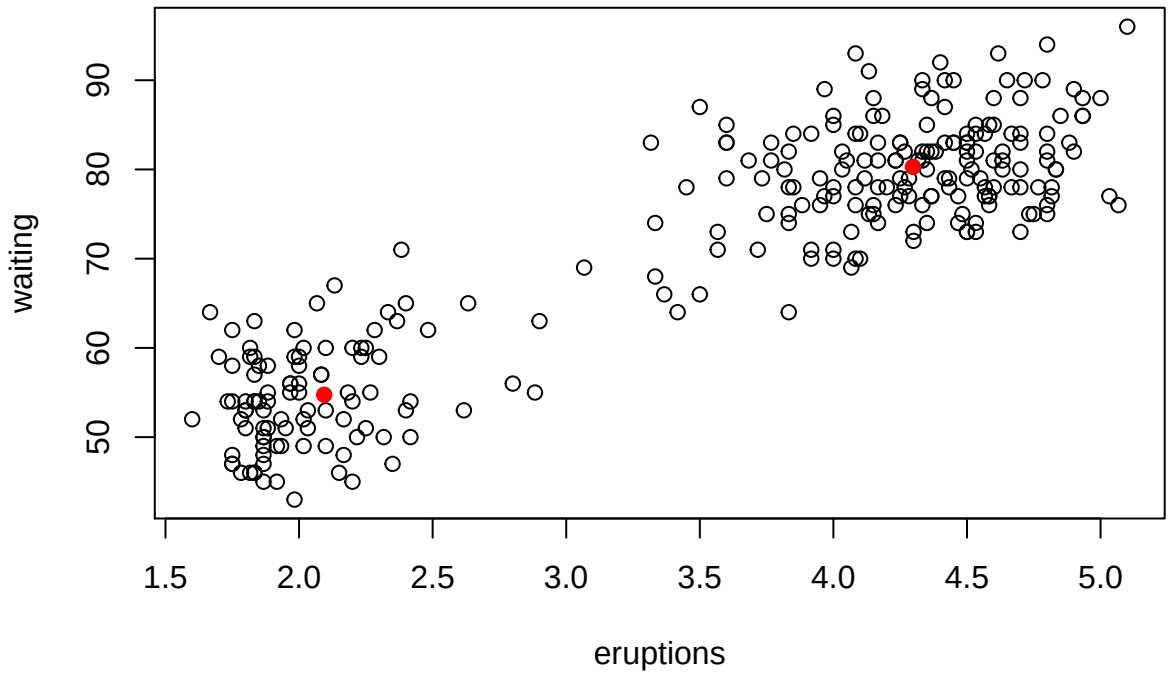
```
kmeans.data<- kmeans(data, 2)

plot(data)
points(kmeans.data$centers, pch=19, col="red")
```



Next do this in Spark. I did this using Python in terminal on the dataset. I used the same commands from the Spark documentation and it worked for me. Below are the following commands.

```
from pyspark.mllib.clustering import KMeans, KMeansModel
from numpy import array
from math import sqrt

# Load and parse the data
data = sc.textFile("data/mllib/faithful.csv")
parsedData = data.map(lambda line: array([float(x) for x in line.split(' ')]))

# Build the model (cluster the data)
clusters = KMeans.train(parsedData, 2, maxIterations=10,
        runs=10, initializationMode="random")

# Evaluate clustering by computing Within Set Sum of Squared Errors
def error(point):
    center = clusters.centers[clusters.predict(point)]
    return sqrt(sum([x**2 for x in (point - center)]))

WSSSE = parsedData.map(lambda point: error(point)).reduce(lambda x, y: x + y)
print("Within Set Sum of Squared Error = " + str(WSSSE))

# Save and load model
clusters.save(sc, "myModelPath")
sameModel = KMeansModel.load(sc, "myModelPath")
```

The clustering is the same as using Kmeans in R. See the plot below which is similar to the plot above.


waiting
50
60
70
80
90
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
eruptions