Clustering using K-Mean algorithm

In this case study we are using Iris dataset with K-Mean algorithm from sklearn.

```
#importing the libraries
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd

#importing the Iris dataset with pandas
dataset = pd.read_csv('iris.csv')
x = dataset.iloc[:, [0, 1, 2, 3]].values

#Finding the optimum number of clusters for k-means classification
from sklearn.cluster import KMeans
wcss = []

for i in range(1, 11):
     kmeans = KMeans(n_clusters = i, init = 'k-means++', max_iter = 300, n_init
= 10, random_state = 0)
    kmeans.fit(x)
    wcss.append(kmeans.inertia_)

#Plotting the results onto a line graph, allowing us to observe 'The elbow'
plt.plot(range(1, 11), wcss)
plt.title('The elbow method')
plt.xlabel('Number of clusters')
plt.ylabel('WCSS')  #within cluster sum of squares
plt.show()

#Applying kmeans to the dataset / Creating the kmeans classifier
kmeans = KMeans(n_clusters = 3, init = 'k-means++', max_iter = 300, n_init =
10, random_state = 0)
y_kmeans = kmeans.fit_predict(x)

#Visualising the clusters
plt.scatter(x[y_kmeans == 0, 0], x[y_kmeans == 0, 1], s = 100, c = 'red', label
= 'Iris-setosa')

plt.scatter(x[y_kmeans == 1, 0], x[y_kmeans == 1, 1], s = 100, c = 'blue', label
= 'Iris-versicolour')

plt.scatter(x[y_kmeans == 2, 0], x[y_kmeans == 2, 1], s = 100, c = 'green',
label = 'Iris-virginica')

#Plotting the centroids of the clusters
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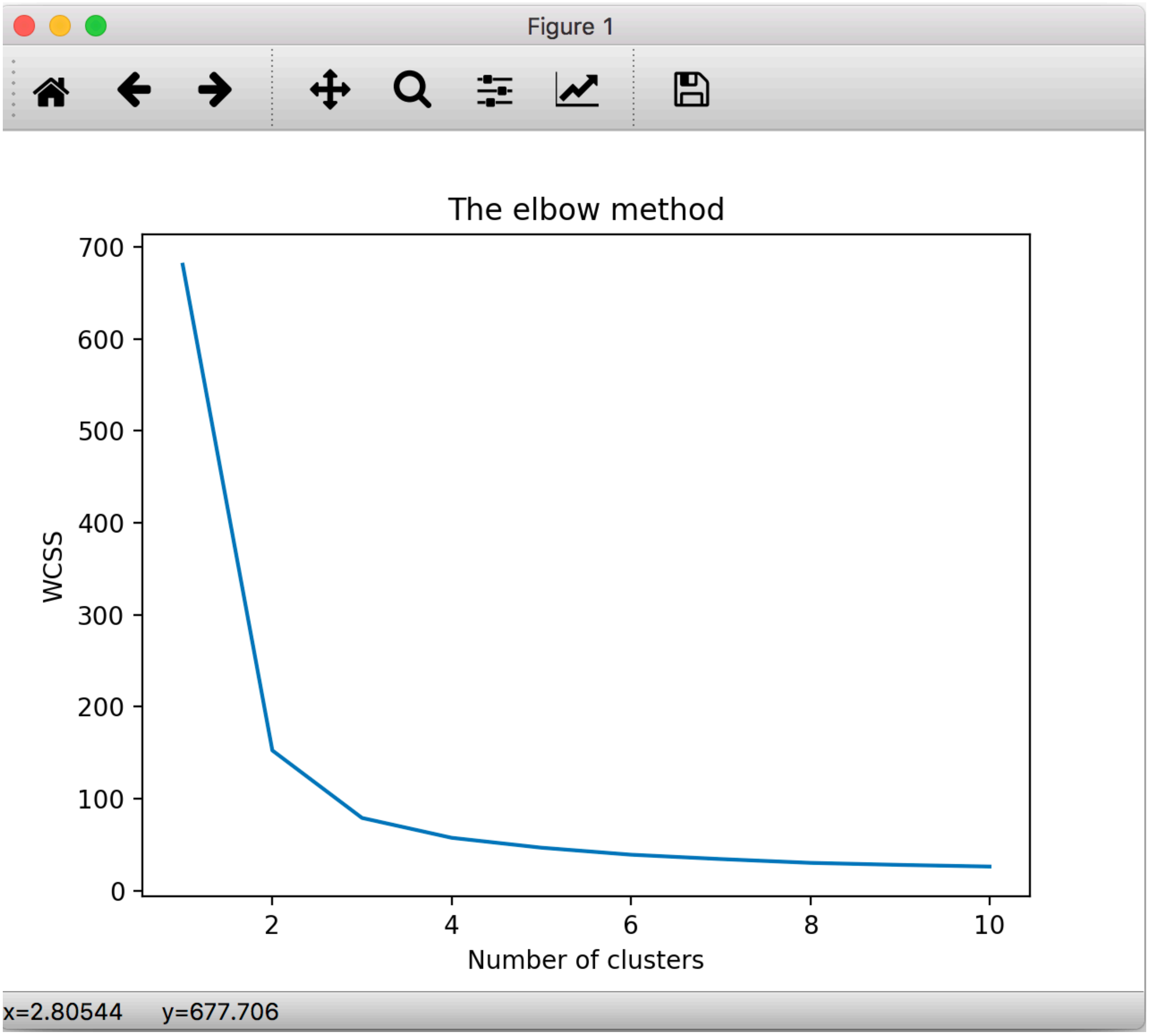
```
plt.scatter(kmeans.cluster_centers_[:, 0], kmeans.cluster_centers_[:,1], s = 100,
c = 'yellow', label = 'Centroids')

plt.legend()

plt.show()
```

Output of above application :



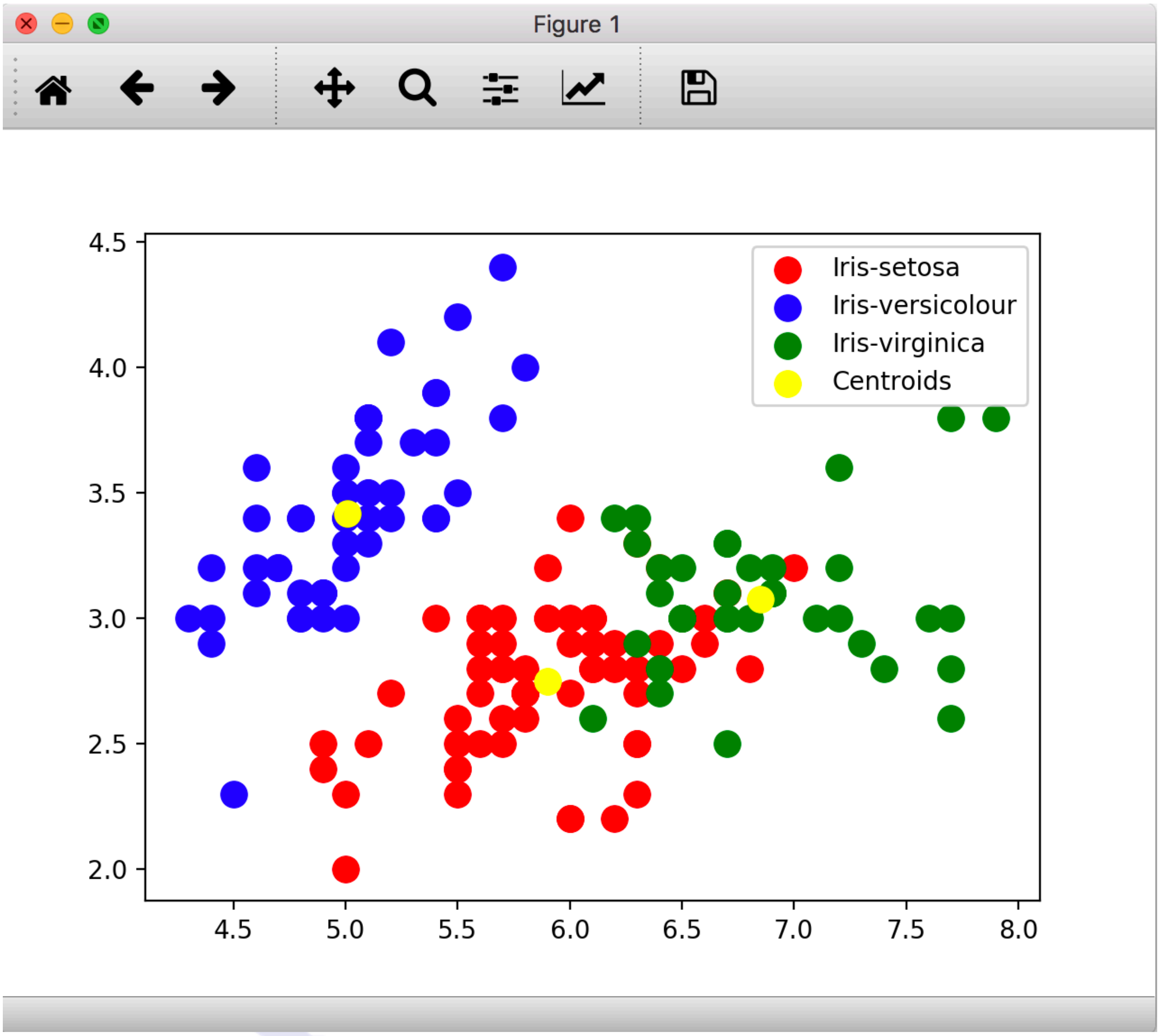


Figure 1
4.5
4.0
3.5
3.0
2.5
2.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
● Iris-setosa
● Iris-versicolour
● Iris-virginica
● Centroids