The Sparks Foundation-Data Science and Business Analytics Internship

TASK 2:Prediction using Unsupervised ML

Done by:Samyuktha Rajkumaran

KMeans_Clustering

Understanding the data

In [172…

```
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
from math import sqrt
from sklearn import datasets
```

In [173…

```
data = pd.read_csv(r"C:\Users\Rajkumar\Downloads\Iris.csv")
data.shape
```

Out[173…

```
(150, 6)
```

In [174…

```
data.head(10)
```

Out[174…

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa
5	6	5.4	3.9	1.7	0.4	Iris-setosa
6	7	4.6	3.4	1.4	0.3	Iris-setosa
7	8	5.0	3.4	1.5	0.2	Iris-setosa
8	9	4.4	2.9	1.4	0.2	Iris-setosa
9	10	4.9	3.1	1.5	0.1	Iris-setosa

In [175…

```
data.describe()
```

Out[175…

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm
count	150.000000	150.000000	150.000000	150.000000	150.000000
mean	75.500000	5.843333	3.054000	3.758667	1.198667
std	43.445368	0.828066	0.433594	1.764420	0.763161
min	1.000000	4.300000	2.000000	1.000000	0.100000
25%	38.250000	5.100000	2.800000	1.600000	0.300000
50%	75.500000	5.800000	3.000000	4.350000	1.300000
75%	112.750000	6.400000	3.300000	5.100000	1.800000
max	150.000000	7.900000	4.400000	6.900000	2.500000

In [176…

```
data
```

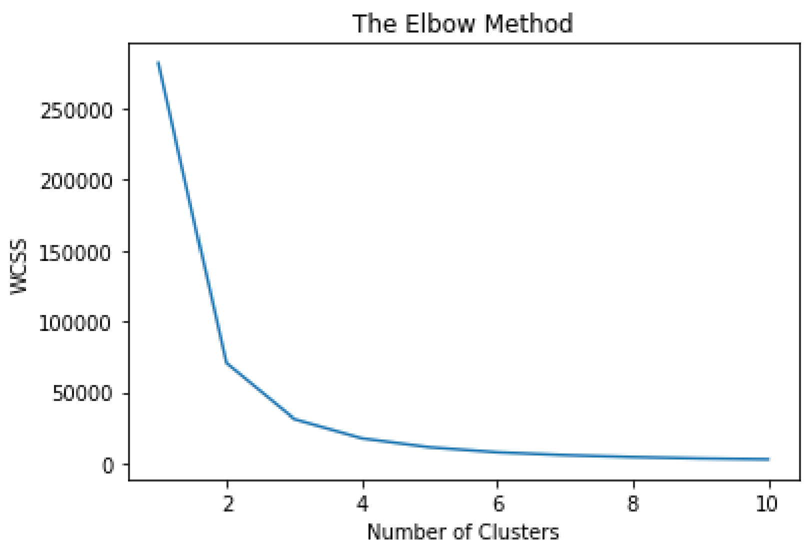
Out[176…

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa
...	...	...	...	...	...	...
145	146	6.7	3.0	5.2	2.3	Iris-virginica
146	147	6.3	2.5	5.0	1.9	Iris-virginica
147	148	6.5	3.0	5.2	2.0	Iris-virginica
148	149	6.2	3.4	5.4	2.3	Iris-virginica
149	150	5.9	3.0	5.1	1.8	Iris-virginica

150 rows × 6 columns

In [177…

```
x=data.iloc[:,[0,1,2,3]].values
from sklearn.cluster import KMeans
list=[]
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)
    list.append(kmeans.inertia_)
plt.plot(range(1,11),list)
plt.title("The Elbow Method")
plt.xlabel("Number of Clusters")
plt.ylabel("WCSS")
plt.show()
```



Creating the k-means classifier

In [178…

```
kmeans=KMeans(n_clusters=3, init='k-means++', max_iter=300, n_init=10, random_state=0)
y_kmeans=kmeans.fit_predict(x)
```

Visualizing the Clusters on first 2 columns

In [179…

```
plt.scatter(x[y_kmeans==0,0], x[y_kmeans==0,1], s=100, c='pink', label='Iris-setosa')
plt.scatter(x[y_kmeans==1,0], x[y_kmeans==1,1], s=100, c='orange', label='Iris-versicolor')
plt.scatter(x[y_kmeans==2,0], x[y_kmeans==2,1], s=100, c='yellow', label='Iris-verginica')

#plotting centriods of clusters
plt.scatter(kmeans.cluster_centers_[:,0], kmeans.cluster_centers_[:,1], s=100, c='black', label='Ce
plt.legend()
```

Out[179…

```
<matplotlib.legend.Legend at 0x2871fe5ddc0>
```