DBSCAN

July 5, 2023

1 DBSCAN

[ ]:
```
# ###############################################################
# This code is from following the linked example below
# - https://youtu.be/2eDFjw456AM
# - https://github.com/siddiquiamir/Python-Clustering-Tutorials/blob/main/
 ↪DBSCAN.ipynb
# ###############################################################

import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

[ ]:
```
df = pd.read_csv("data/Mall_customers.csv")
```

[ ]:
```
df.head()
```

[ ]:

	1	Male	19	15	39
0	2	Male	21	15	81
1	3	Female	20	16	6
2	4	Female	23	16	77
3	5	Female	31	17	40
4	6	Female	22	17	76

[ ]:
```
df.tail()
```

[ ]:

	1	Male	19	15	39
194	196	Female	35	120	79
195	197	Female	45	126	28
196	198	Male	32	126	74
197	199	Male	32	137	18
198	200	Male	30	137	83

[ ]:
```
df.shape
```

[ ]:
```
(199, 5)
```

[ ]:
```
df = df.iloc[:, [3,4]].values
```

[ ]:
```
df
```

[ ]:
```
array([[ 15,  81],
       [ 16,   6],
       [ 16,  77],
       [ 17,  40],
       [ 17,  76],
       [ 18,   6],
       [ 18,  94],
       [ 19,   3],
       [ 19,  72],
       [ 19,  14],
       [ 19,  99],
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       [ 20,  77],
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       [ 20,  79],
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       [ 21,  66],
       [ 23,  29],
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       [ 24,  35],
       [ 24,  73],
       [ 25,   5],
       [ 25,  73],
       [ 28,  14],
       [ 28,  82],
       [ 28,  32],
       [ 28,  61],
       [ 29,  31],
       [ 29,  87],
       [ 30,   4],
       [ 30,  73],
       [ 33,   4],
       [ 33,  92],
       [ 33,  14],
       [ 33,  81],
       [ 34,  17],
       [ 34,  73],
       [ 37,  26],
       [ 37,  75],
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       [ 38,  92],
       [ 39,  36],
       [ 39,  61],
       [ 39,  28],
       [ 39,  65],
```

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```

```
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```

```
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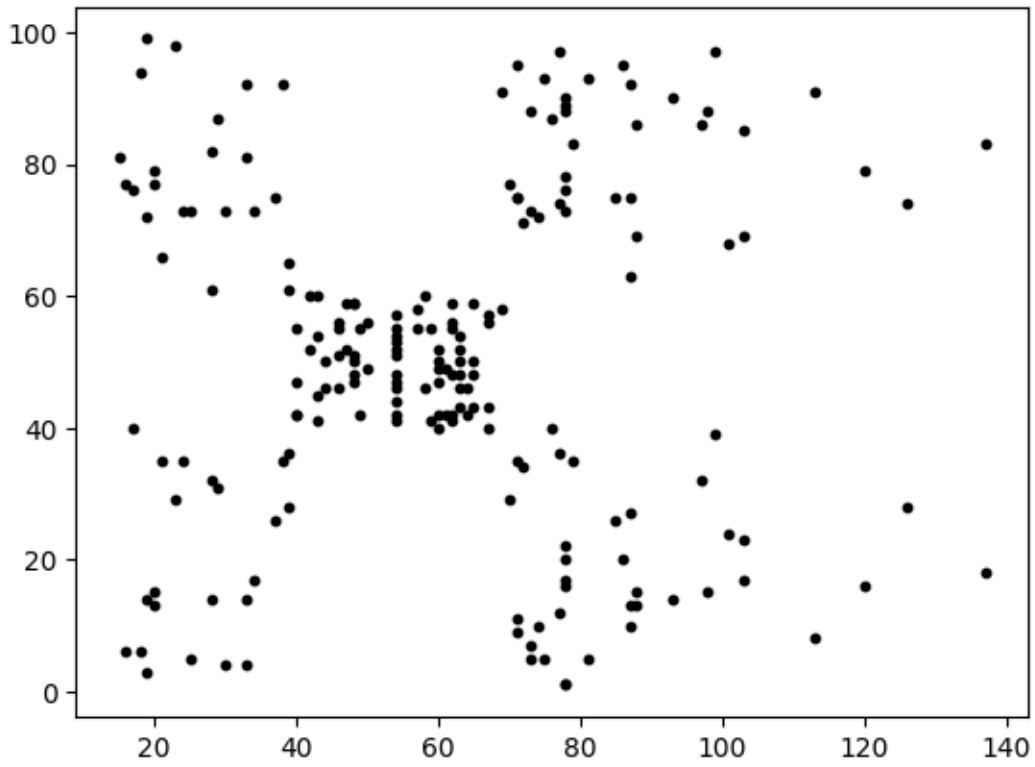
       [113,   8],
       [113,  91],
       [120,  16],
       [120,  79],
       [126,  28],
       [126,  74],
       [137,  18],
       [137,  83]], dtype=int64)
```

[ ]:
```
plt.scatter(df[:,0], df[:,1], s=10, c= "black")
```

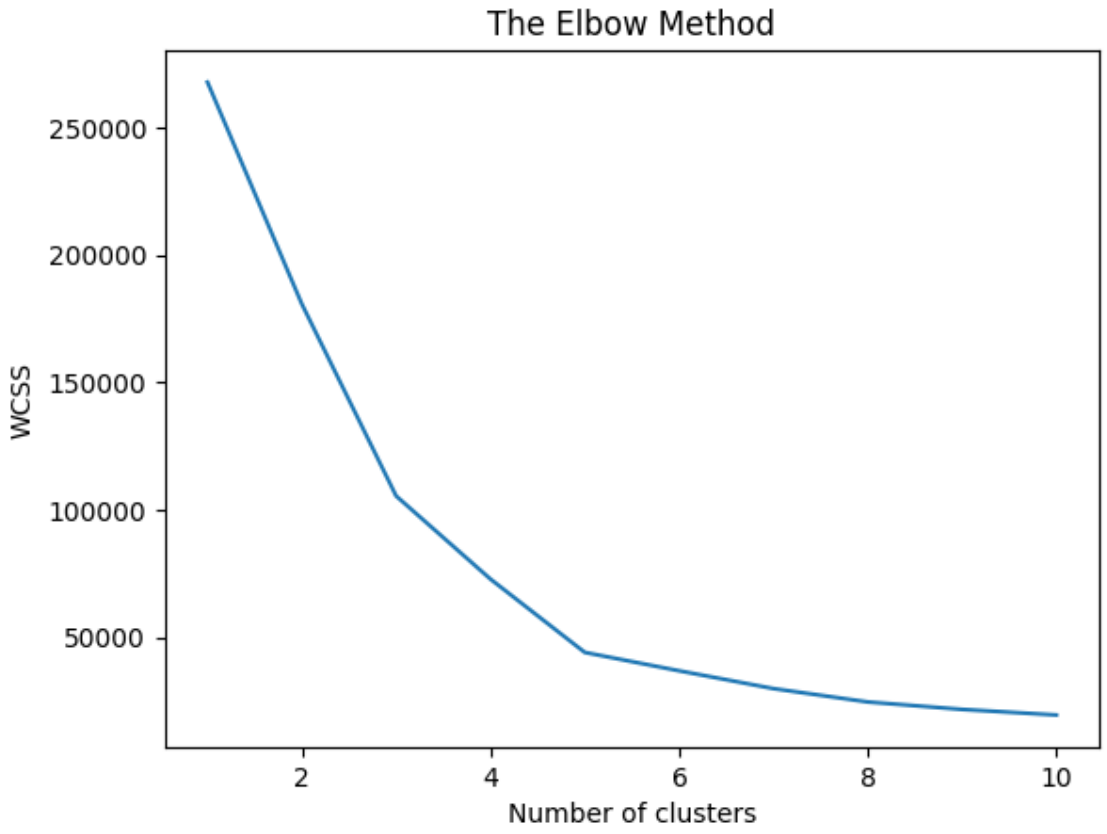
[ ]:
```
<matplotlib.collections.PathCollection at 0x16884173710>
```



[ ]:
```
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)
    kmeans.fit(df)
    wcss.append(kmeans.inertia_)
plt.plot(range(1,11), wcss)
plt.title("The Elbow Method")
plt.xlabel("Number of clusters")
plt.ylabel("WCSS")
plt.show()
```



[ ]:
```
from sklearn.cluster import DBSCAN
```

[ ]:
```
dbscan = DBSCAN(eps=5, min_samples=5)
```

[ ]:
```
labels = dbscan.fit_predict(df)
```

[ ]:
```
np.unique(labels)
```

[ ]:
```
array([-1,  0,  1,  2,  3,  4], dtype=int64)
```

[ ]:
```
# Visualising the clusters
plt.scatter(df[labels == -1, 0], df[labels == -1, 1], s = 10, c = 'black')

plt.scatter(df[labels == 0, 0], df[labels == 0, 1], s = 10, c = 'blue')
plt.scatter(df[labels == 1, 0], df[labels == 1, 1], s = 10, c = 'red')
plt.scatter(df[labels == 2, 0], df[labels == 2, 1], s = 10, c = 'green')
plt.scatter(df[labels == 3, 0], df[labels == 3, 1], s = 10, c = 'brown')
plt.scatter(df[labels == 4, 0], df[labels == 4, 1], s = 10, c = 'pink')
plt.scatter(df[labels == 5, 0], df[labels == 5, 1], s = 10, c = 'yellow')
plt.scatter(df[labels == 6, 0], df[labels == 6, 1], s = 10, c = 'silver')

plt.xlabel('Annual Income')
plt.ylabel('Spending Score')
plt.show()
```