

Experiment - 11

Implementation of Clustering Techniques

k-means

AIM

To implement a k-means clustering technique using python language.

PROGRAM

```
import numpy as np
import pandas as pd
from matplotlib import pyplot as plt
from sklearn.datasets import generate_data
import math
from sklearn.cluster import KMeans

x, y = generate_data(n_samples=300, centers=4,
                    cluster_std=0.60, random_state=0)
plt.scatter(x[:, 0], x[:, 1])

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_)

plt.plot(range(1, 11), wcss)
plt.title('Elbow on method')
plt.xlabel('Number of clusters')
plt.ylabel('WCSS')
plt.show()
```

```
kmeans = KMeans (n_clusters = 4, init = 'k-means++',
max_iter = 300, n_init = 10,
random_state = 0)
```

```
pred_y = kmeans.fit_predict(x)
```

```
plt.scatter(x[:, 0], x[:, 1])
```

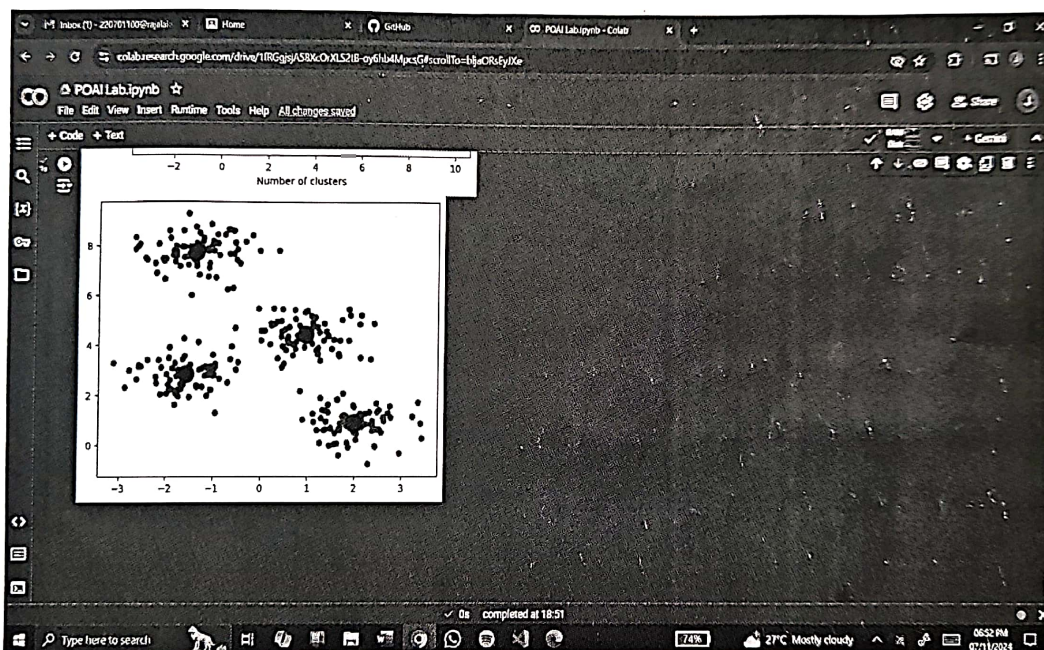
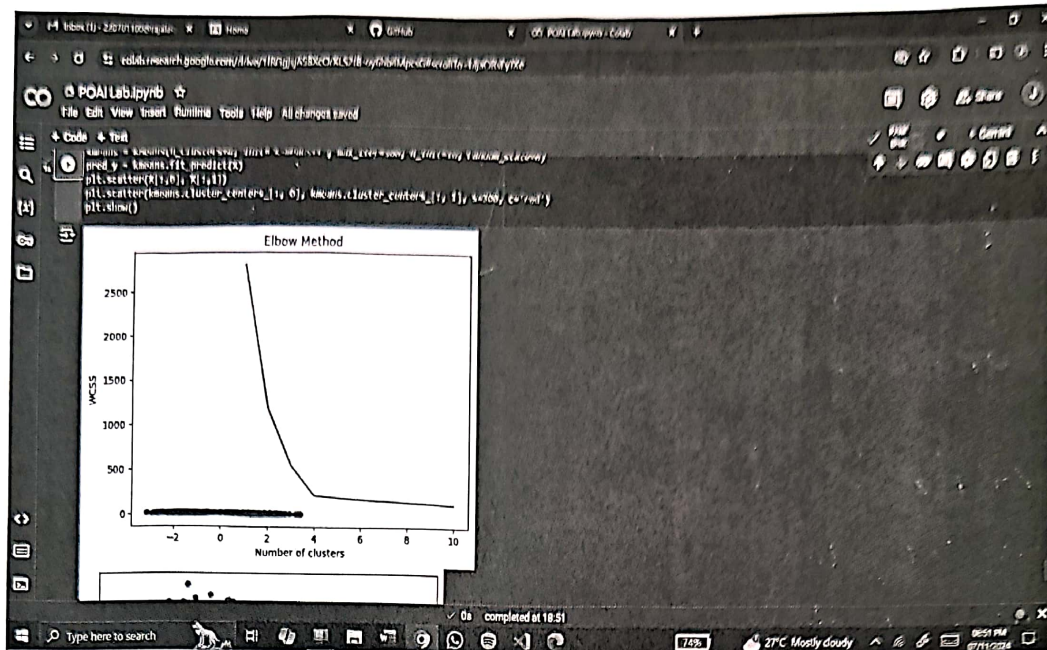
```
plt.scatter(kmeans.cluster_centers_[:, 0],
kmeans.cluster_centers_[:, 1], s = 300,
c = 'red')
```

```
plt.show()
```

OUTPUT

OUTPUT

OUTPUT



RESULT

Thus, the program for K-Means clustering technique is successfully executed and the output is verified.