EXP:7

Clustering

AIM:

To write a python programming for clustering using python and import, mannay dataset.

Code:

```
import pandas as pd.
import matplotlib.pyplot as plot.
from sealearn cluster import k means
from sklearn preprocessing import
                    standard scales.
import seaborn as sns.
df = pd.read_csv('mail - customer.csv')
k means = k means (cluster = 5 -
                    random - state)
df['cluster'] = k means.fit
clustset(x = []
for i in range [1, 11]:
    k m = k means (n-cluster = i)
plt - xlabel (inatic)
from sklearn. matrics import
        subplot. scatt
x_ scaled = standard scale ()
        pase - clusters []
```

```
for k in [3, 4, 5]
km = kmeans(n_clusters = k, random
                state = RNS)

plt.figure(fig_size (10, 10))
plt.scatter(x_pca[:,0],
plt.title("(3rd oversampling clustering
                on wbc dataset)")
plt.xlabel("PCA components")
plt.ylabel("PCA components")
plt.grid("fin")
plt.show()
```

Result:

Therefore the required program for clustering that by for successfully.