DATA SCIENCE LAB

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Roll No:17

Batch: MCA-B

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Experiment No.: 11

Aim

K-means clustering algorithm.

Procedure

```
from sklearn.cluster  import KMeans
import pandas as pd
from sklearn.preprocessing import MinMaxScaler
from matplotlib import pyplot as plt
%matplotlib inline

df = pd.read_csv("income.csv")
df.head()
```

Output:

	Name	Age	Income($)
0	Rob	27	70000
1	Michael	29	90000
2	Mohan	29	61000
3	Ismail	28	60000
4	Kory	42	150000

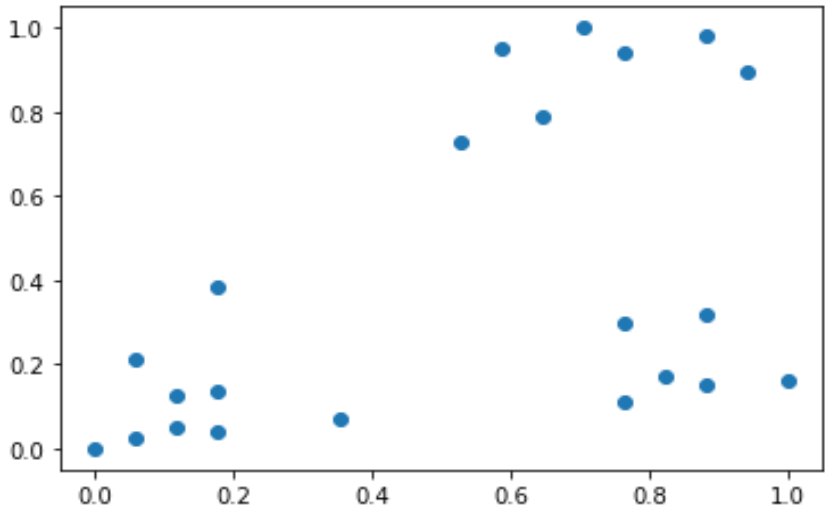
```
scaler = MinMaxScaler()

scaler.fit(df[['Income($)']])
df['Income($)'] = scaler.transform(df[['Income($)']])

scaler.fit(df[['Age']])
df['Age'] = scaler.transform(df[['Age']])


plt.scatter(df.Age,df['Income($)'])
```

Output:




```
km = KMeans(n_clusters=3)
y_predicted = km.fit_predict(df[['Age','Income($)']])
y_predicted
```

Output

```
array([0, 0, 0, 0, 2, 2, 2, 2, 2, 2, 2, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 1],
dtype=int32)
```

```
df['cluster']=y_predicted
df.head()
```

Output

	Name	Age	Income($)	cluster
0	Rob	0.058824	0.213675	0
1	Michael	0.176471	0.384615	0
2	Mohan	0.176471	0.136752	0
3	Ismail	0.117647	0.128205	0
4	Kory	0.941176	0.897436	2

```
km.cluster_centers_
```

Output:

```
array([[0.1372549 , 0.11633428], [0.85294118, 0.2022792 ], [0.72268908,
0.8974359 ]])
```

```
df1 = df[df.cluster==0]
df2 = df[df.cluster==1]
df3 = df[df.cluster==2]
plt.scatter(df1.Age,df1['Income($)'],color='green')
plt.scatter(df2.Age,df2['Income($)'],color='red')
plt.scatter(df3.Age,df3['Income($)'],color='black')
plt.scatter(km.cluster_centers_[:,0],km.cluster_centers_[:,1],color='purple
',marker='*',label='centroid')
plt.legend()
```

OUTPUT :