#$Name:V.CHARAN$

#Pin no:21X01A6754

#Branch:CSE-DATASCIENCE

#College:NRCM

##Project Title : Analysis and Prediction of "Mall_Customers.csv" of phonix small to find out how many customers are visited to a particular shop. On the basis of this prediction of annual income vs spending scores.

#DISCLAIMER

In this particular datset we assume annual income as centroid and spending score from the range "1 to 100" called as "DATA NODES OF THE CLUSTERS"

PROBLEM STATMENT The american finance market as per the GDP of 2011,'phoniex_tryllums' as in the first range in the out of file.The owner wants to be exact which particular shop or a products. Search in different type of clusters in entire mall

As a data science engineer predict the futuristic financial market per up[coming GDP ray.Based on number of clusters

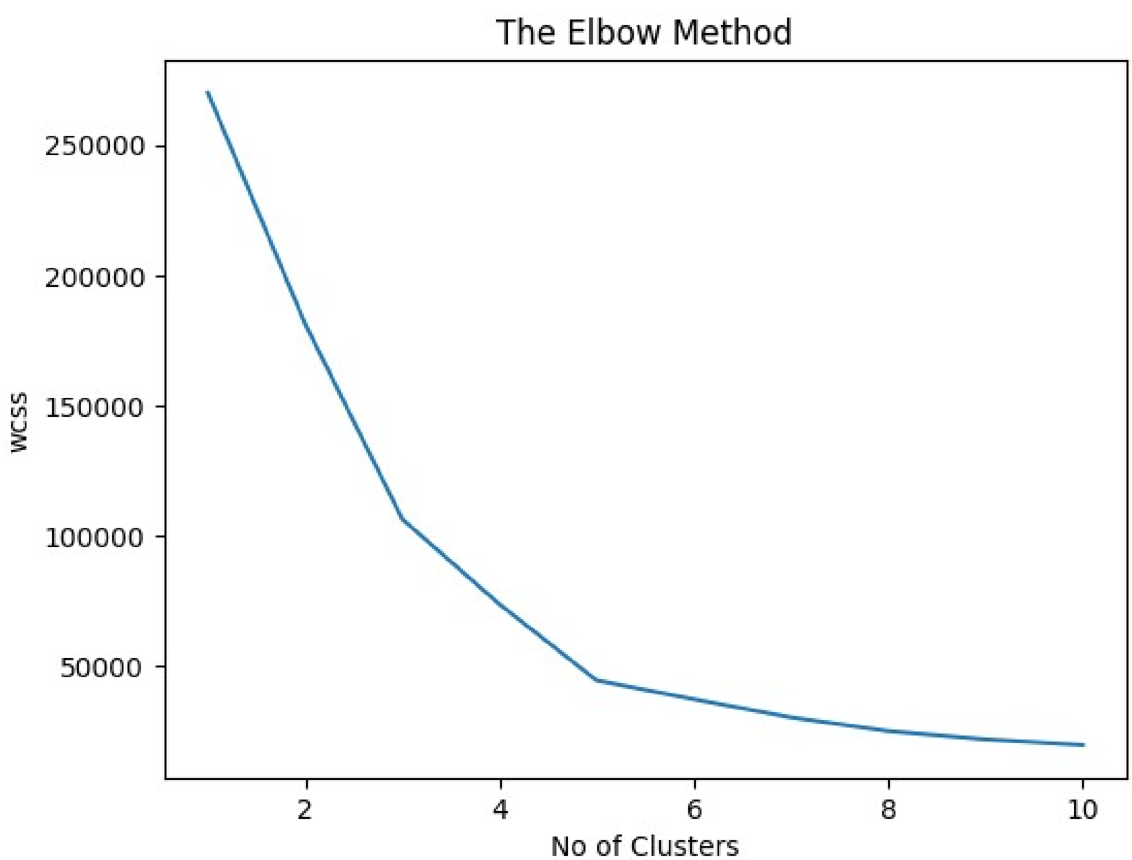
The client want atleast top 5 clusters-SHOP

```
#import the numpy, matplot, pandas libery's
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt

#Read the dataset take variable name called "dataset" only.
dataset=pd.read_csv("Mall_Customers.csv")
dataset
# without printing this data add in separet variable as input variable
Caqpital X only. loc index by select the all row ,
#and give the required colum index like[3,4].for this particular
dataset.
x=dataset.iloc[:,[3,4]].values

## <THE ELBOW METHOD>
#from sklearn used "sklearn.cluster" attribute and import KMeans
from sklearn.cluster import KMeans
#Take a distance from from centroid to cluster point with
WrapsColumnExpression.
wcss=[]
# Assume you have 10 cluster and iterate the for up to range 10 with
iterater kmeans++.
for i in range (1,11):
  kmeans=KMeans(n_clusters=i,init="k-means++",random_state=42)
  kmeans.fit(x)
```

```
  wcss.append(kmeans.inertia_)
plt.plot(range(1,11),wcss)

plt.title("The Elbow Method")
plt.xlabel("No of Clusters")
plt.ylabel("wcss")
plt.show()
# Fit the model if value comes too samlla in range.
#For clustering in wcss ,inertia is adding / appending is required.
(kmeans.inertia_)#defalut usecase.
#Plot the poarticular graph along with the wcss and your range which
you taken as input variable.
#Add title "The Elbow Method".
#Lable x variable as "No of Customers".
#Lable y variable as "WCSS".
#Plot the graph using plt.show().
```

```
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/
_kmeans.py:870: FutureWarning: The default value of `n_init` will
change from 10 to 'auto' in 1.4. Set the value of `n_init` explicitly
to suppress the warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
```

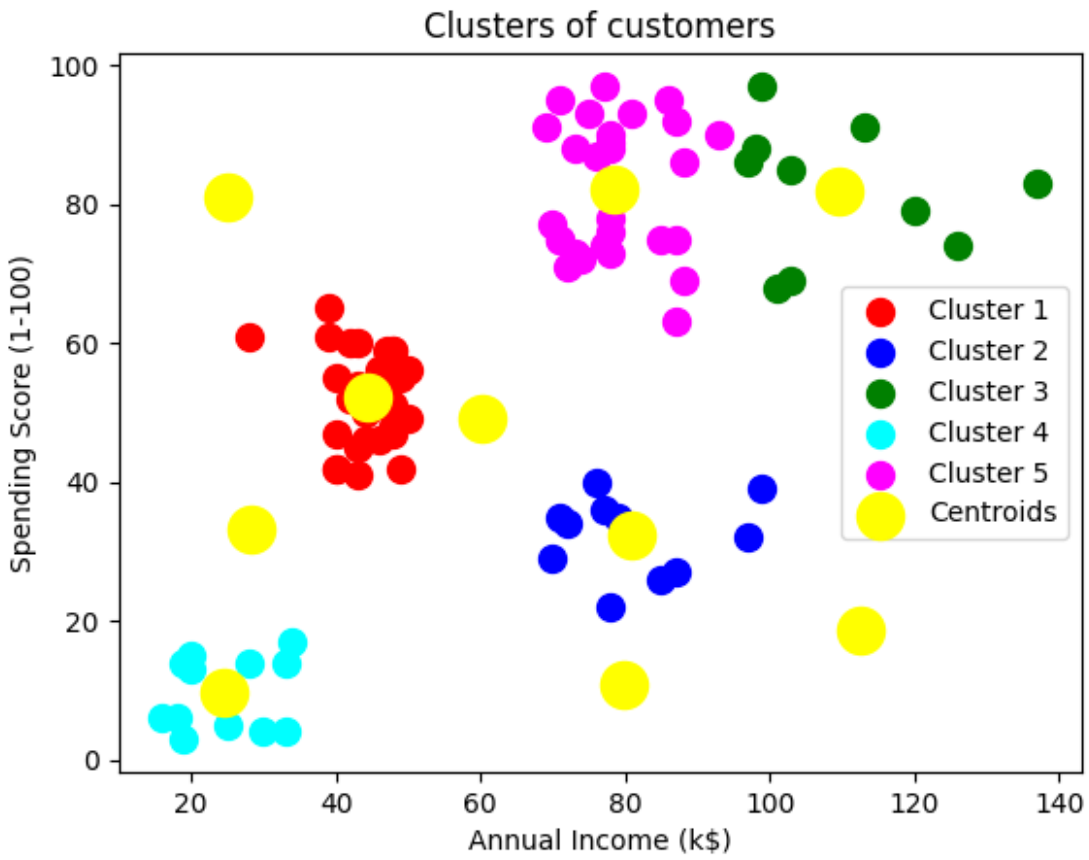
```
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
warning
  warnings.warn(
```




```
for i in range(1,11):
  kmeans=KMeans(n_clusters=i,init="k-means++",random_state=42)
  y_kmeans=kmeans.fit_predict(x)
```

```
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/
_kmeans.py:870: FutureWarning: The default value of `n_init` will
change from 10 to 'auto' in 1.4. Set the value of `n_init` explicitly
to suppress the warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
warning
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870
: FutureWarning: The default value of `n_init` will change from 10 to
'auto' in 1.4. Set the value of `n_init` explicitly to suppress the
```

```
warning
  warnings.warn(

# Take any no of cluster and run you take 5.
plt.scatter(x[y_kmeans == 0, 0], x[y_kmeans == 0, 1], s = 100, c =
'red', label = 'Cluster 1')
plt.scatter(x[y_kmeans == 1, 0], x[y_kmeans == 1, 1], s = 100, c =
'blue', label = 'Cluster 2')
plt.scatter(x[y_kmeans == 2, 0], x[y_kmeans == 2, 1], s = 100, c =
'green', label = 'Cluster 3')
plt.scatter(x[y_kmeans == 3, 0], x[y_kmeans == 3, 1], s = 100, c =
'cyan', label = 'Cluster 4')
plt.scatter(x[y_kmeans == 4, 0], x[y_kmeans == 4, 1], s = 100, c =
'magenta', label = 'Cluster 5')

#Write Code for rest.SS

plt.scatter(kmeans.cluster_centers_[:, 0], kmeans.cluster_centers_[:,
1], s = 300, c = 'yellow', label = 'Centroids')
plt.title('Clusters of customers')
plt.xlabel('Annual Income (k$)')
plt.ylabel('Spending Score (1-100)')
plt.legend()
plt.show()
```



#CONCLUSION According to the model basics predictoin using machine learning "KM" "k is clustering".

We found that "cluster 1" which consists red is highest cluster,Which attach more than 50 datanodes.

#REFERENCES: The model building algorithm devlop for all kinds of clusteration values.The "yellow spot represent CENTROID".