nrcm-kmeans-1

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##**Name:**K.Saivinay ##**Roll No:**21X05A6731 ##**Brance:**Data Science Final Year ##**College:**Narsimha Reddy Engineering College

##**Project Title:** ###Analysis and Prediciton of **"small_customers.csv"** of American Mall Markets called as Phonix Mall to find out how many customers are visited to a particular shop. on the basis of this prediction of annual income Verses spending scores.

##**Disclaimer:** ###In this particular dataset we assume annual income as a centroid and spending scores from the range 1 to 100 called as datanode of the cluster.

##**Problem Statement:** ###The American Finance Market as per the **GDP** of 2011 **'Phonix_Trilliums Mall'** as in the first range out of 5. The onwer of the mall wants to be exact which particular shop or product such in different kinds of clusters in entire mall. ###As the Data Science Engineer predict the futuristic financial market for upcomming GDP rate based on No.of cluster. ###The client wants atleast 5 clusters[shops].

[26]:
```
#import the numpy, matlot, pandas libery's
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

[27]:
```
#Read the dataset take variable name called "dataset" only.
data = pd.read_csv("/content/Mall_Customers.csv")
print(data.head())
```

```
   CustomerID   Genre  Age  Annual Income (k$)  Spending Score (1-100)
0           1    Male   19                  15                      39
1           2    Male   21                  15                      81
2           3  Female   20                  16                       6
3           4  Female   23                  16                      77
4           5  Female   31                  17                      40
```

[29]:
```
# 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 = data.iloc[:,[3,4]].values
print(X)
```

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 [113   8]
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 [126  74]
 [137  18]
 [137  83]]
```

[30]:

```
## <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:
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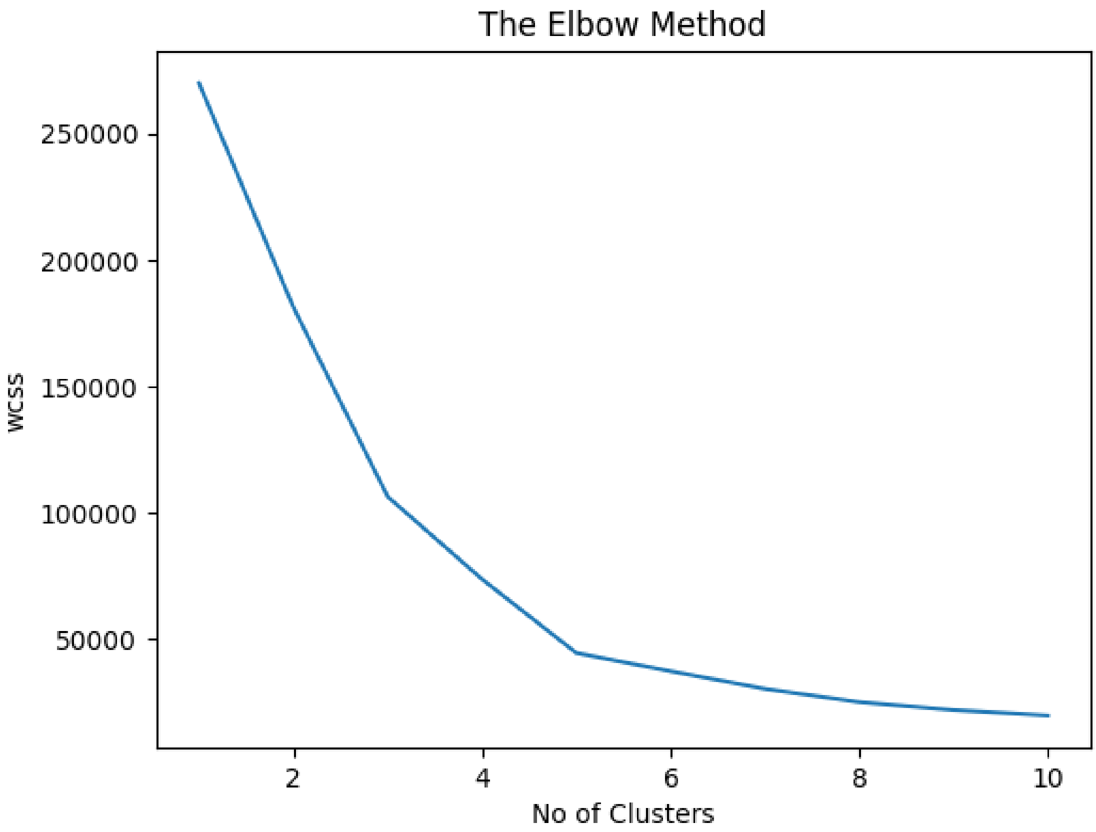
```



[31]:

```
for i in range(1,11):
  kmeans=KMeans(n_clusters = 5, init="k-means++",random_state=42)
  y_kmeans=kmeans.fit_predict(X)
```

```
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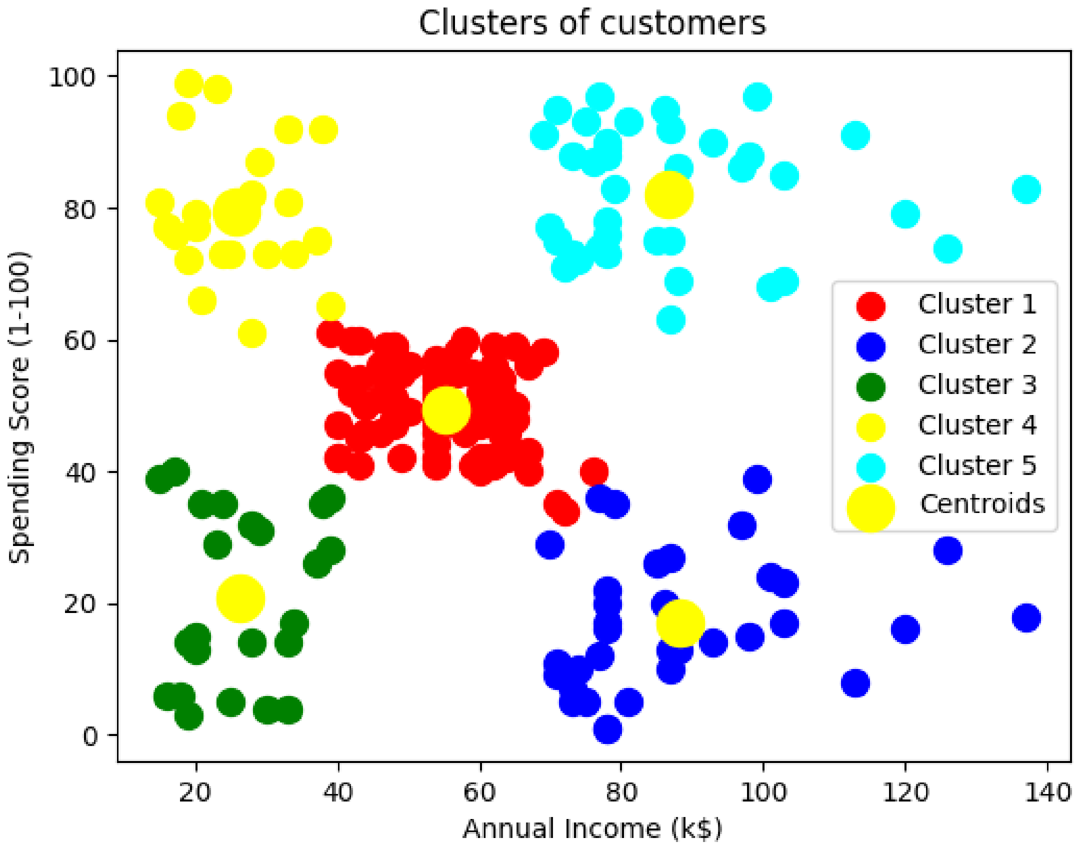
```

[32]:

```
# 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 = 'yellow',␣
  ↪label = 'Cluster 4')
plt.scatter(X[y_kmeans == 4, 0], X[y_kmeans == 4, 1], s = 100, c = 'cyan',␣
  ↪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 model basis prediction using Machine Learning algorithm KMeans Clustering we found that Cluster-1 which consists Red color is the highest cluster which attach more than 50 Datanodes.

##**References:** ###The model building algorithm develop for all kinds of clusteration values. The yellow spots represents **"Centroids"** which is max to max only 3.

```
[ ]:
```