kmeans-algorithm

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#Project Title: Analysis and prediction of "Mall_Customers.csv" of American mall arket called as Phonix Mall To find out how many customers are visited to a particular shop. On the bases of this prediction of annual income vs spending scores

#Disclamer: In this particular dataset we assume annual income as a centriod and spending score from the rane 1 to 100 called as data node of the cluster

#Problem Statement: The American Finace Market as per the GDP of 2011 'Phonics_Trillums Mall' as in the first range out of 5.

The owner of the mall wants to be excat which particular shop all product such in different kind of clusters in entire mall.

As a DataScience Engineer predict the futuristic finaical market GDP rate based on number of clusters.

The client wants atleast top 5 clusters[shops]

[3]:
```
#import the numpy, matlot, pandas libery's
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

[6]:
```
#Read the dataset take variable name called "dataset" only.
dataset = pd.read_csv("Mall_Customers.csv")
# 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
```

[18]:
```
## <THE ELBOW METHOD>
#from sklearn used "sklearn.cluster" attribute and import KMeans
#Take a distance from from centroid to cluster point with WrapsColumnExpression.
# Assume you have 10 cluster and iterate the for up to range 10 with iterater␣
 ↪kmeans++.
# Fit the model if value comes too samlla in range.
#For clustering in wcss ,inertia is adding / appending is required.(kmeans.
 ↪inertia_)#defalut usecase.
```

```python
#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().
from sklearn.cluster import KMeans
wcss = []
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()
```

```
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870:
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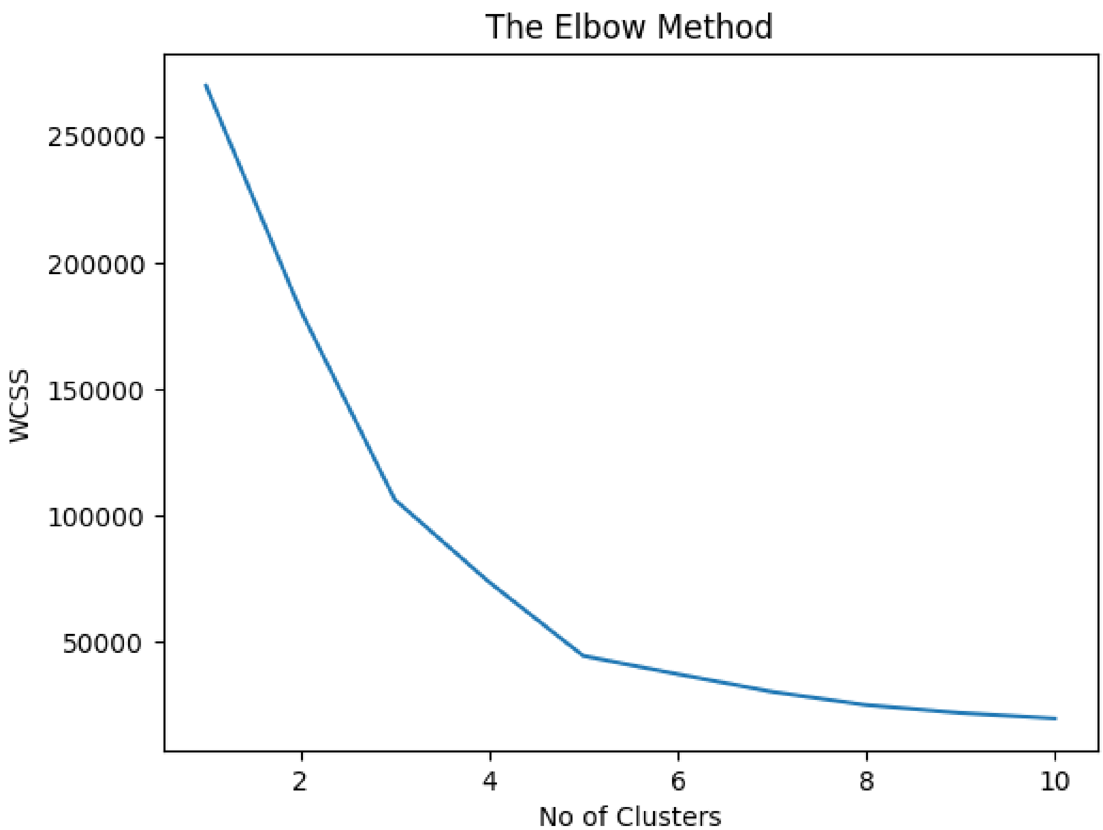

[24]:
```python
for i in range(1, 11):
    kmeans = KMeans(n_clusters=3, init="k-means++", random_state=42)
    y_kmeans = kmeans.fit_predict(x)
```

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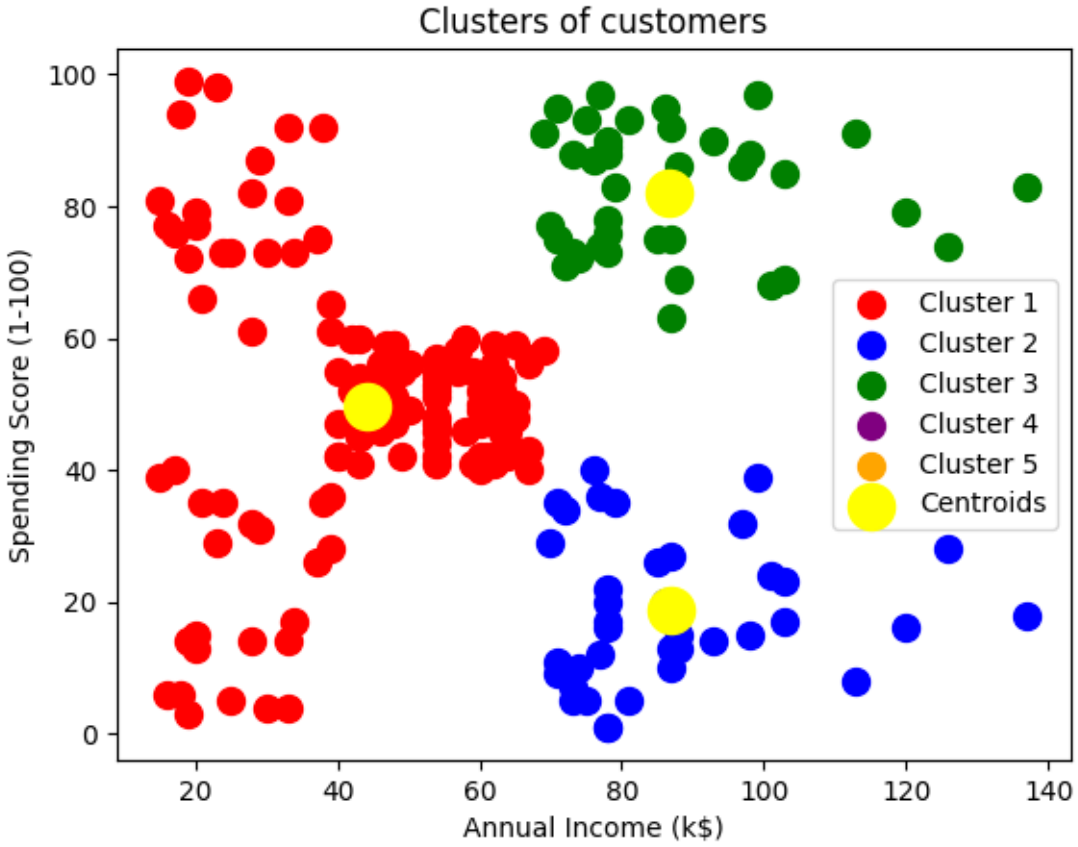
[27]:

```
# 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='purple',␣
 ↪label='Cluster 4')
```

```
plt.scatter(x[y_kmeans == 4, 0], x[y_kmeans == 4, 1], s=100, c='orange',␣
 ↪label='Cluster 5')

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 basic prediction using Machine Learning Algorithm KMeans Clustering we found that custer-1 which consists Red colour is a highest cluster whixh attach more than 50 Data Nodes.

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