kmeans

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0.3 Branch : Data Science

0.4 College : Narasimha Reddy Engineering College UGC Autonomous

0.5 Project Title :

0.5.1 Analysis and prediction of "Mall_Customers.csv" of American mall market 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 versus spending scores.

0.6 Disclaimer :

0.6.1 In this particular dataset we assume that annual income as a centroid and spending score from the 1 to 100 called as datanodes of the clusters.

0.7 Problem Statement :

0.7.1 The American finance market as per the GDP of 2011 'phonix_trillums' mall as in the 1st range out of 5. The owner wants to be exact which particular shop on product search in different kind of clusters in entire mall.

0.7.2 As a Data Science Engineer predict the futuristic finanal market GDP rate based on no. of clusters.

0.7.3 The client wants atleast top 5 clusters[shops].

[33]:
```
#import the numpy, matlot, pandas libery's
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

[34]:
```
#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
```

[35]:
```python
## <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.
#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:
FutureWarning: The default value of `n_init` will change from 10 to 'auto' in
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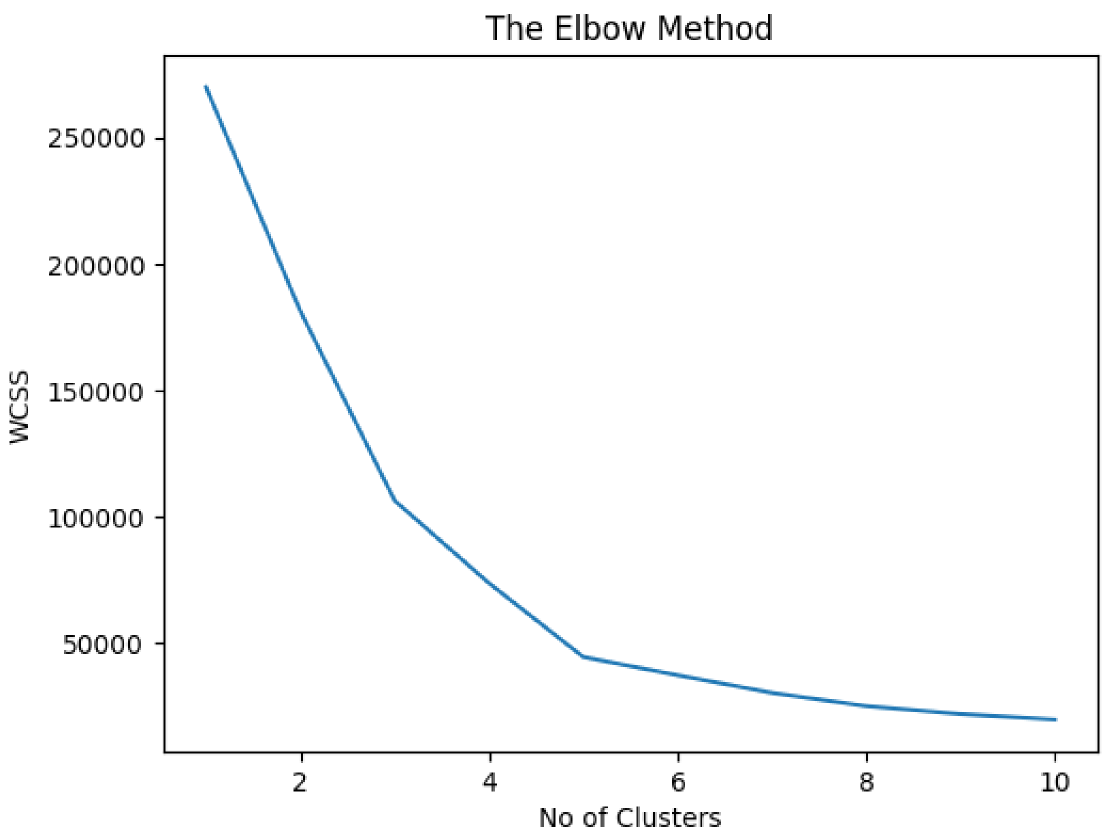

[36]:
```
for i in range(1, 11):
    kmeans = KMeans(n_clusters=3, init="k-means++", random_state=42)
    y_kmeans = kmeans.fit_predict(x)
```

```
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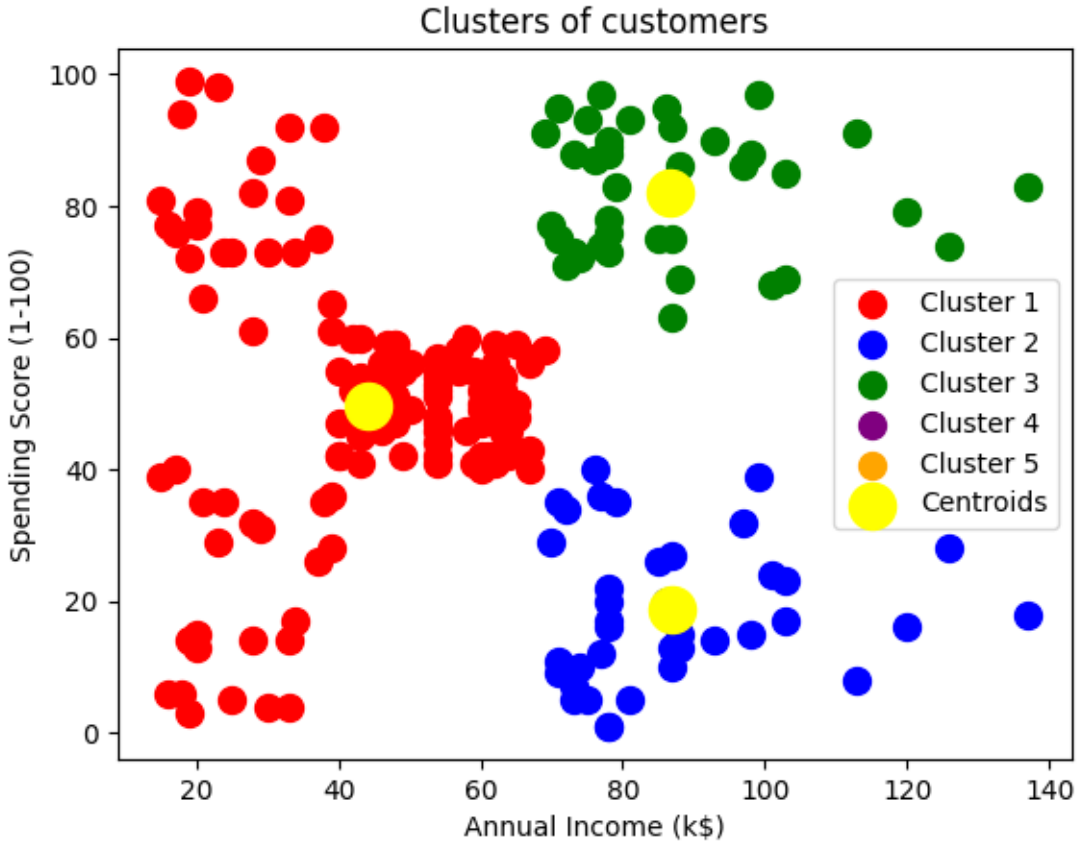
[37]:
```
# Take any no of cluster and run you take 5.
plt.scatter(x[y_kmeans == 0, 0], x[y_kmeans == 0, 1], s=100, c='red',␣
 ↪label='Cluster 1')
plt.scatter(x[y_kmeans == 1, 0], x[y_kmeans == 1, 1], s=100, c='blue',␣
 ↪label='Cluster 2')
```

```
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()
```



0.8 Conclusion :

0.8.1 According to the model basics prediction using machine learning algorithm KMeans clustering we found that cluster1 which consists red color is the highest cluster which attach more than 50 datanodes.

0.9 References :

0.9.1 The model building algorithm develop for all kinds of clusteration values. The yellow spots represents centroids are max to max only 3.