nrcm-kmeans-1-1

August 28, 2023

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

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##Project Title : Analysis and prediction of "small customers.csv" American Mall market called as phonix small.To find out how may customers are visited to a particular shop on the basis of this prediction of annual income vs spending scores

###Disclaimer: In this particular dataset we assume annual income as a centroid and spending score from the range 1to 100 called as data node s of the cluster

##problem statement: The americak finance market as per the gdp of 2011 The american finance market 'PHONIX_TRILLIUMS MALL" as in the first range out of 5.The owner of the mall is want to be exact which particular shop or product search in different kinds of clusters in entire mall ##2)As a Datascience engineer predict the futuristic finacial market for upcoming gdp rate based on no:of clusters.The client wants atleast top 5 cluster in shops.

[ ]:
```python
#Read the dataset take variable name called "dataset" only.
from google.colab import files
files=files.upload()
# 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.
```

```
<IPython.core.display.HTML object>
```

```
Saving Mall_Customers.csv to Mall_Customers.csv
```

[ ]:
```python

```

[ ]:
```python
dataset=pd.read_csv('Mall_Customers.csv')
dataset.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
```

[ ]:
```
dataset.shape
```

[ ]:
```
(200, 5)
```

[ ]:
```
x=dataset.iloc[:,[3,4]].values
x
```

[ ]:
```
array([[ 15,  39],
       [ 15,  81],
       [ 16,   6],
       [ 16,  77],
       [ 17,  40],
       [ 17,  76],
       [ 18,   6],
       [ 18,  94],
       [ 19,   3],
       [ 19,  72],
       [ 19,  14],
       [ 19,  99],
       [ 20,  15],
       [ 20,  77],
       [ 20,  13],
       [ 20,  79],
       [ 21,  35],
       [ 21,  66],
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       [ 24,  35],
       [ 24,  73],
       [ 25,   5],
       [ 25,  73],
       [ 28,  14],
       [ 28,  82],
       [ 28,  32],
       [ 28,  61],
       [ 29,  31],
       [ 29,  87],
       [ 30,   4],
       [ 30,  73],
       [ 33,   4],
       [ 33,  92],
       [ 33,  14],
       [ 33,  81],
```

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[ 87,  13],
[ 87,  75],
[ 87,  10],
[ 87,  92],
[ 88,  13],
[ 88,  86],
[ 88,  15],
```

```
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       [ 97,  32],
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       [113,  91],
       [120,  16],
       [120,  79],
       [126,  28],
       [126,  74],
       [137,  18],
       [137,  83]])
```

[ ]:
```
## <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.
```

```python
#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(
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```

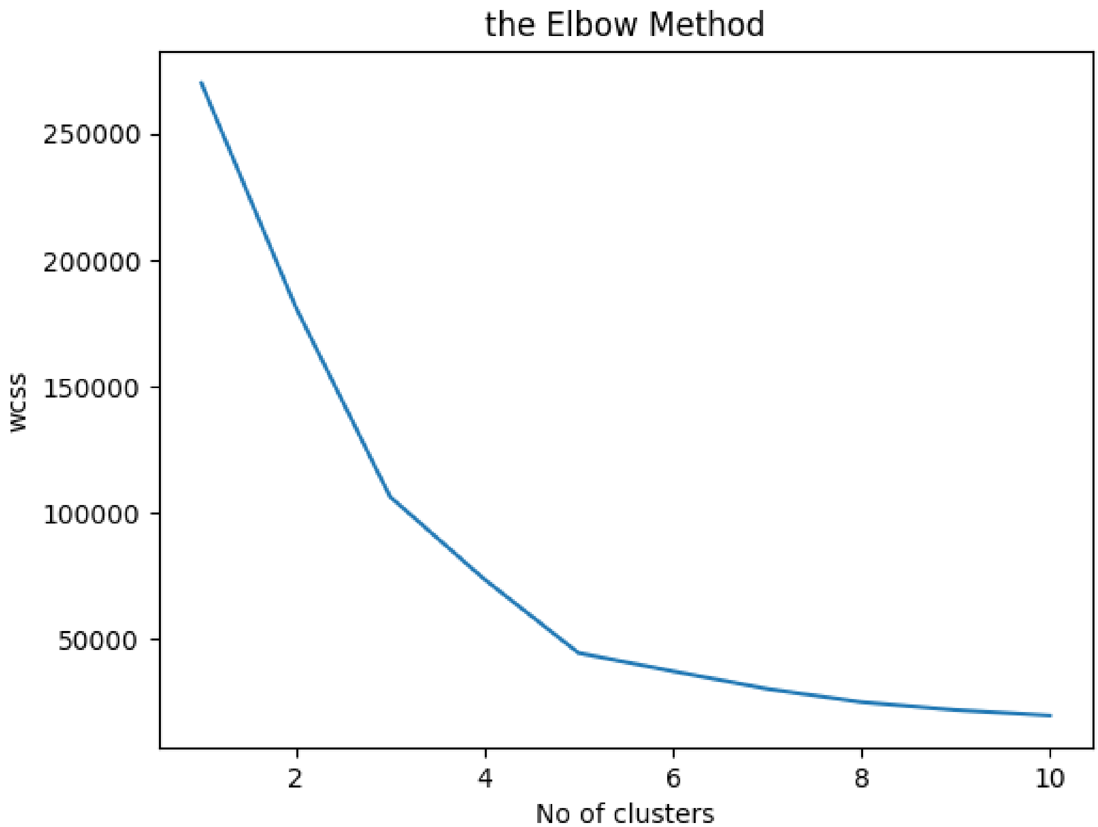

[ ]:
```
for i in range(1,11):
  kmeans=KMeans(n_clusters=5,init='k-means++',random_state=42)
  y_predict=kmeans.fit_predict(x)
```

```
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```
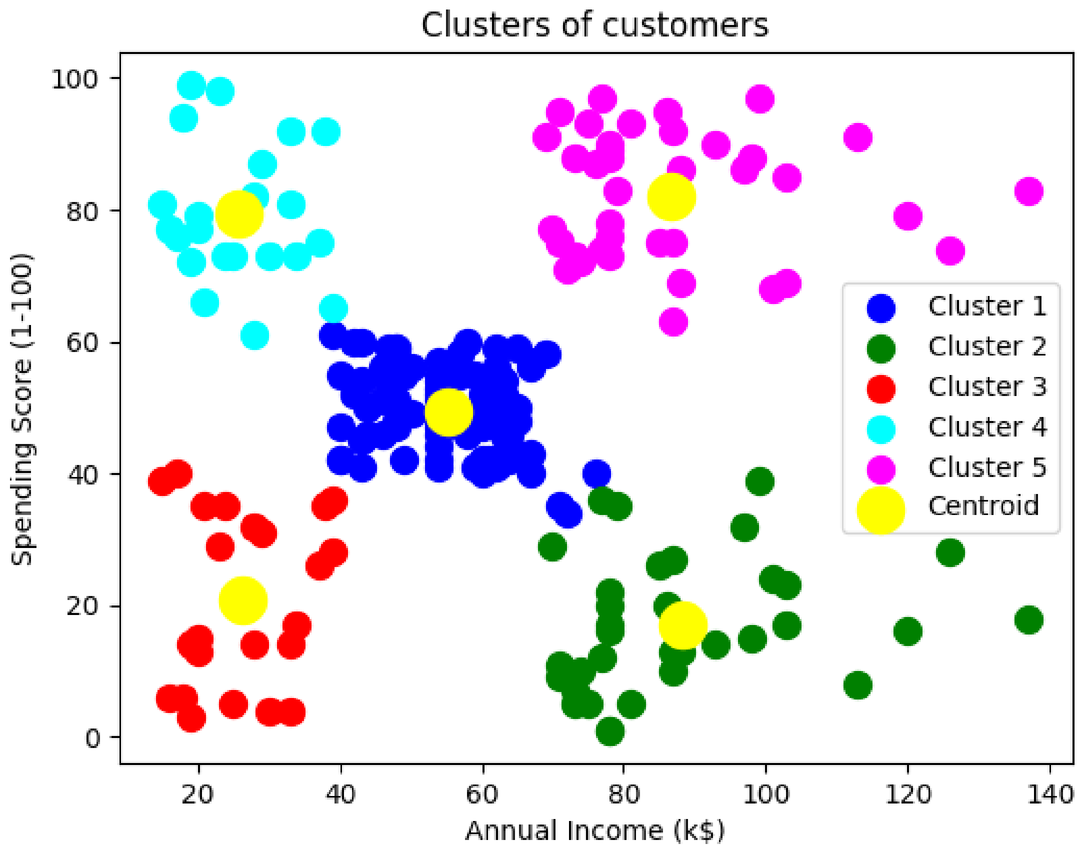

[ ]:
```
plt.scatter(x[y_predict == 0,0],x[y_predict == 0,1], s = 100, c = 'blue', label
↪= 'Cluster 1') #for first cluster
plt.scatter(x[y_predict == 1,0], x[y_predict == 1,1], s = 100, c = 'green',
↪label = 'Cluster 2') #for second cluster
plt.scatter(x[y_predict== 2,0], x[y_predict == 2,1], s = 100, c = 'red', label
↪= 'Cluster 3') #for third cluster
plt.scatter(x[y_predict == 3,0], x[y_predict == 3,1], s = 100, c = 'cyan',
↪label = 'Cluster 4') #for fourth cluster
plt.scatter(x[y_predict == 4,0], x[y_predict == 4,1], s = 100, c = 'magenta',
↪label = 'Cluster 5') #for fifth cluster
plt.scatter(kmeans.cluster_centers_[:, 0], kmeans.cluster_centers_[:, 1], s =
↪300, c = 'yellow', label = 'Centroid')
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 prediction using machine learning algorithm k_means clustering we found that cluster one which consists of blue color is the highest color which attached more than 50 datanodes.

##REFERENCES:THe model building algorithm devolop for all kinds of cluteration values.THE YELLOW Ssquads represents centroids which is max to max only 5.

```
[ ]:
```