customer segmentation code-Copy1

November 15, 2023

```
[31]: #importing python libraries
      import numpy as np
      import pandas as pd
      import seaborn as sns
      import matplotlib.pyplot as plt
```

```
[32]: #uploading dataset
      data=pd.read_csv("Mall_customers.csv")
```

```
[33]: #top 10 rows
      data.head(10)
```

```
[33]:    CustomerID  Gender  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
      5           6  Female   22                  17                      76
      6           7  Female   35                  18                       6
      7           8  Female   23                  18                      94
      8           9    Male   64                  19                       3
      9          10  Female   30                  19                      72
```

```
[34]: #bottom 10 rows
      data.tail(10)
```

```
[34]:      CustomerID  Gender  Age  Annual Income (k$)  Spending Score (1-100)
      190         191  Female   34                 103                      23
      191         192  Female   32                 103                      69
      192         193    Male   33                 113                       8
      193         194  Female   38                 113                      91
      194         195  Female   47                 120                      16
      195         196  Female   35                 120                      79
      196         197  Female   45                 126                      28
      197         198    Male   32                 126                      74
      198         199    Male   32                 137                      18
      199         200    Male   30                 137                      83
```

[35]:

```
#to know no.of rows and columns ,use
data.shape
```

[35]:

```
(200, 5)
```

[36]:

```
#describing the availabe data
data.describe
```

[36]:

```
<bound method NDFrame.describe of      CustomerID  Gender  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
..          …     …  …                 …                     …
195         196  Female   35                 120                      79
196         197  Female   45                 126                      28
197         198    Male   32                 126                      74
198         199    Male   32                 137                      18
199         200    Male   30                 137                      83

[200 rows x 5 columns]>
```

[37]:

```
# checking weather any null values are present from the available dataset
data.isnull().sum()
```

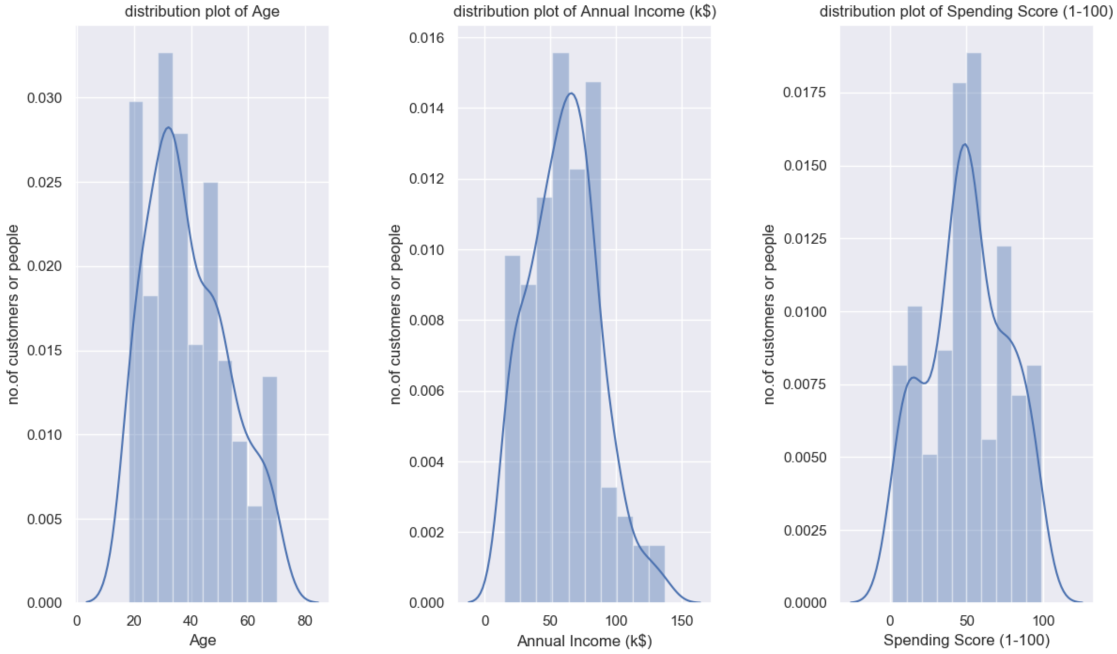
[37]:

```
CustomerID                0
Gender                    0
Age                       0
Annual Income (k$)        0
Spending Score (1-100)    0
dtype: int64
```

[38]:

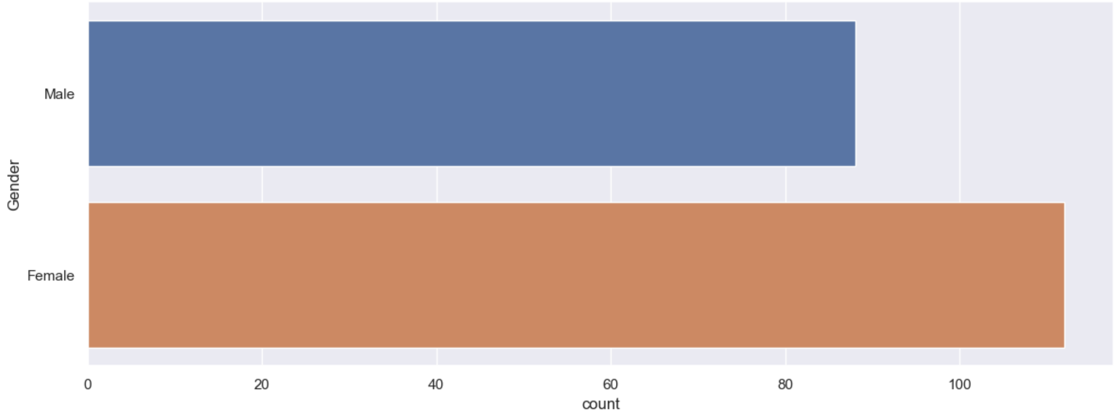
```
#visualisation of Age,Annual Income (k$),Spending Score (1-100) using␣
 ↪matplotlib and seaborn
plt.figure(1,figsize=(14,8))
n=0
for i in ['Age','Annual Income (k$)','Spending Score (1-100)']:
    n+=1
    plt.subplot(1,3,n)
    plt.subplots_adjust(hspace=0.5,wspace=0.5)
    sns.distplot(data[i],bins=10)
    plt.title('distribution plot of {}'.format(i))
    plt.ylabel("no.of customers or people")

plt.show()
```



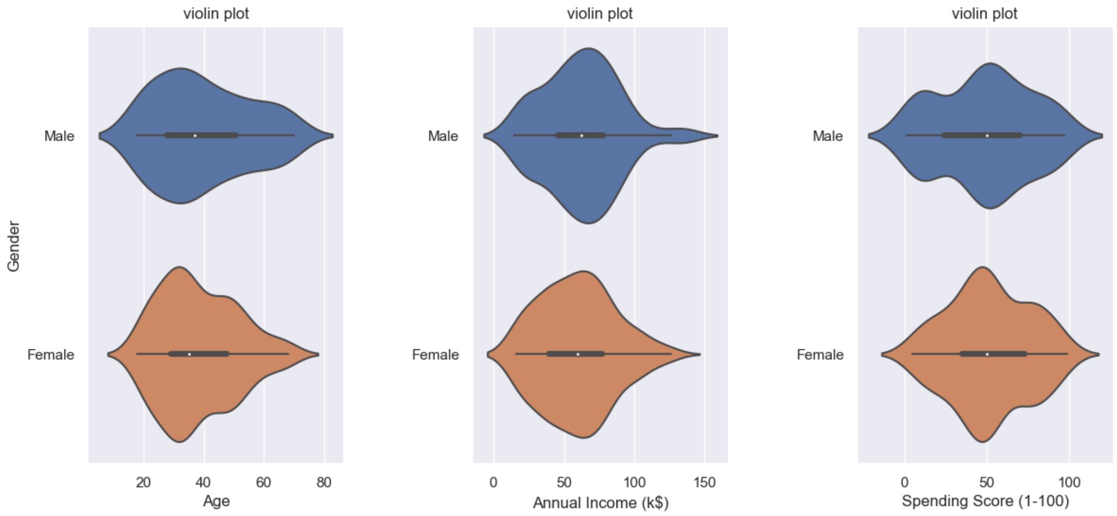
[48]:

```
plt.figure(figsize=(14,5))
sns.countplot(data=data,y='Gender')
plt.show()
```



[39]:

```
#comparission between male and females
plt.figure(1,figsize=(14,6))
n=0
for i in ['Age','Annual Income (k$)','Spending Score (1-100)']:
    n+=1
    plt.subplot(1,3,n)
    sns.set(style="darkgrid")
    plt.subplots_adjust(hspace=0.5,wspace=0.5)
    sns.violinplot(x=i,y='Gender',data=data)
    plt.ylabel('Gender' if n==1 else '')
    plt.title("violin plot")
plt.show()
```



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

```
[40]: 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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              [ 25,   5],
              [ 25,  73],
              [ 28,  14],
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              [ 33,  92],
              [ 33,  14],
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              [ 63,  54],
              [ 64,  42],
              [ 64,  46],
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              [101,  24],
              [101,  68],
              [103,  17],
              [103,  85],
              [103,  23],
              [103,  69],
              [113,   8],
              [113,  91],
              [120,  16],
              [120,  79],
              [126,  28],
              [126,  74],
              [137,  18],
              [137,  83]], dtype=int64)
```

[13]:

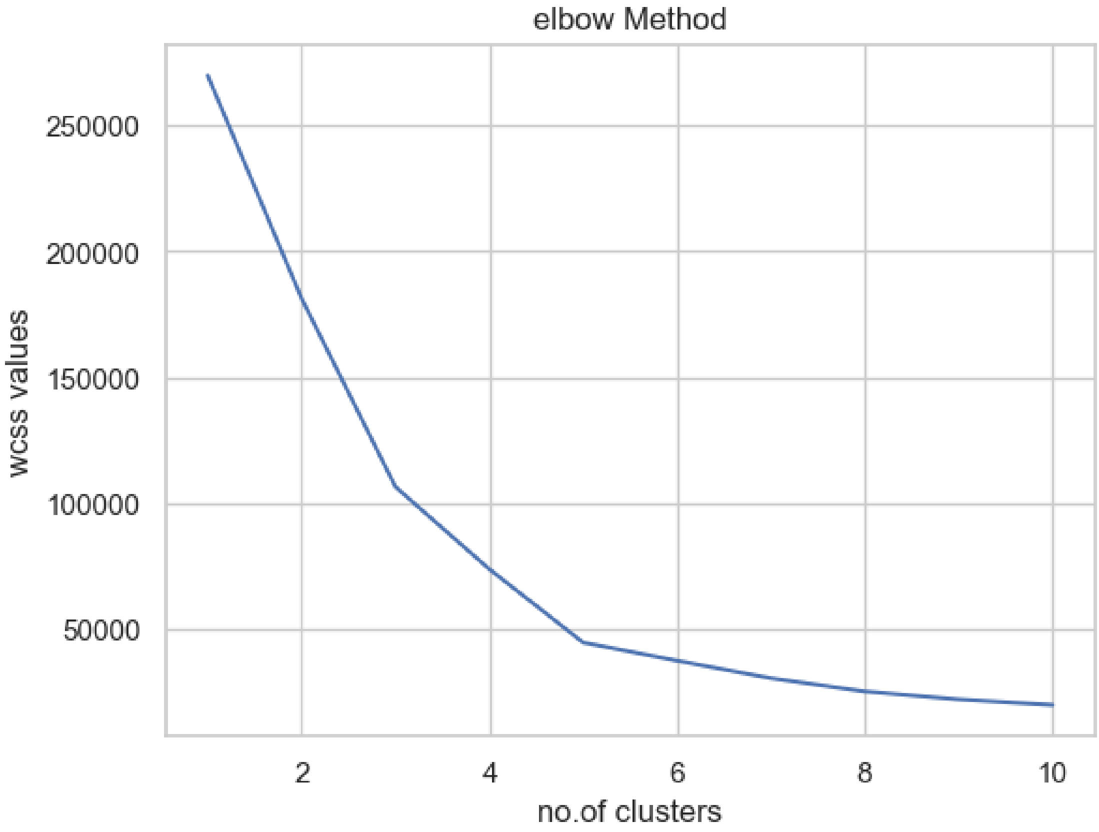
```
import sklearn
```

[14]:

```
from sklearn.cluster import KMeans
wcss=[]
for i in range(1,11):
    kmeans=KMeans(n_clusters=i,init='k-means++',random_state=0)
    kmeans.fit(x)
    wcss.append(kmeans.inertia_)
```

[15]:

```
plt.plot(range(1,11),wcss)
plt.title("elbow Method")
plt.xlabel("no.of clusters")
plt.ylabel("wcss values")
plt.show()
```

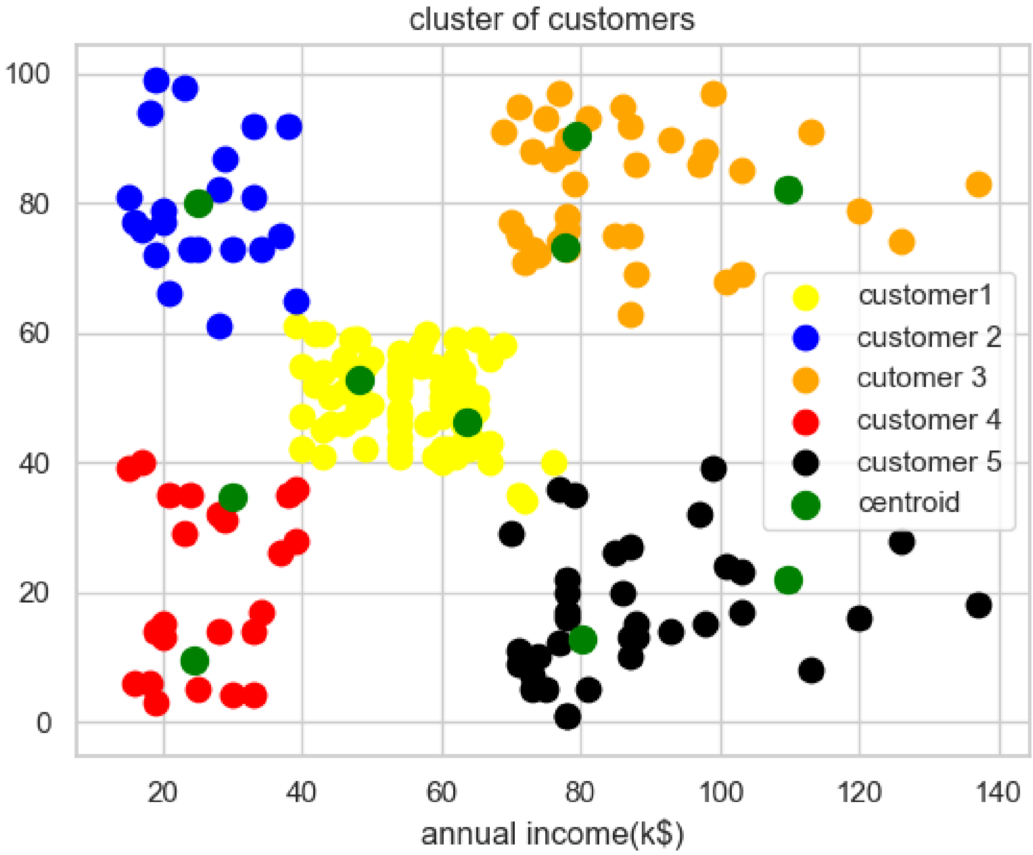


[16]:

```
kmeansmodel=KMeans(n_clusters=5, init='k-means++', random_state=0)
y_kmeans = kmeansmodel.fit_predict(x)
```

[17]:

```
plt.scatter(x[y_kmeans==0,0],x[y_kmeans==0,1],s=80, c="yellow",␣
 ↪label="customer1")
plt.scatter(x[y_kmeans==1,0],x[y_kmeans==1,1],s=80, c= "blue", label="customer␣
 ↪2")
plt.scatter(x[y_kmeans==2,0],x[y_kmeans==2,1],s=80, c="orange", label="cutomer␣
 ↪3")
plt.scatter(x[y_kmeans==3,0],x[y_kmeans==3,1],s=80, c="red", label="customer 4")
plt.scatter(x[y_kmeans==4,0],x[y_kmeans==4,1],s=80, c="black", label="customer␣
 ↪5")
plt.scatter(kmeans.cluster_centers_[:,0],kmeans.cluster_centers_[:
 ↪,1],s=100,c="green",label="centroid")
plt.title("cluster of customers")
plt.xlabel("annual income(k$)")
plt.legend()
plt.show()
```



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