```
import matplotlib.pyplot as plt
import seaborn as sns
import pandas as pd
df=pd.read_csv('/content/Mall_Customers.csv')
print(df.head(15))
```

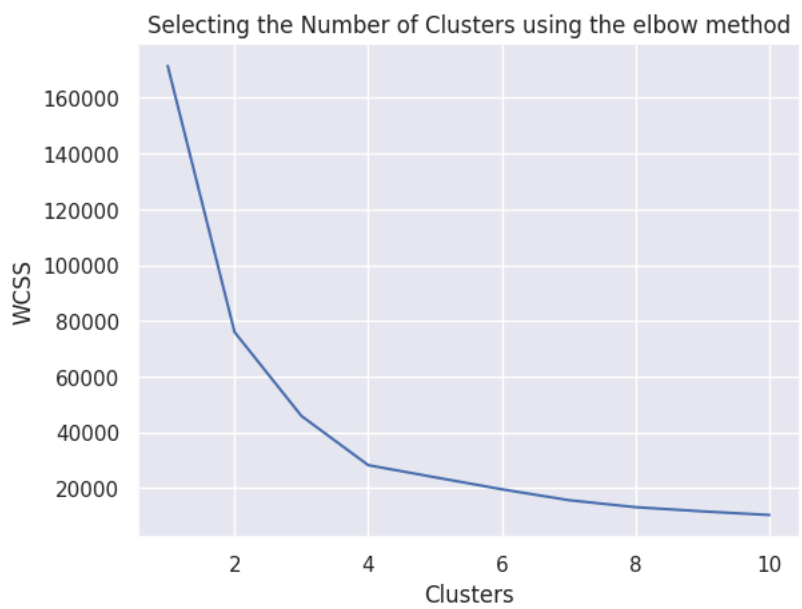
```
    CustomerID  Gender  Age  Annual Income (k$)  Spending Score (1-100)
0            1    Male   19                  15                      39
1            2    Male   21                  15                      81
2            3  Female   20                  16                       6
3            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
10          11    Male   67                  19                      14
11          12  Female   35                  19                      99
12          13  Female   58                  20                      15
13          14  Female   24                  20                      77
14          15    Male   37                  20                      13
```

```
from sklearn.cluster import KMeans
x=df[['Age','Spending Score (1-100)']].copy()
```

```
for i in range(1,11):
  kmeans=KMeans(n_clusters=i, init='k-means++', max_iter=300, n_init=10,random_state=0)
  kmeans.fit(x)
```

```
wcss=[]
for i in range(1,11):
  kmeans=KMeans(n_clusters=i, init='k-means++', max_iter=300, n_init=10,random_state=0)
  kmeans.fit(x)
  wcss.append(kmeans.inertia_)
```

```
sns.set()
plt.plot(range(1,11),wcss)
plt.title('Selecting the Number of Clusters using the elbow method')
plt.xlabel('Clusters')
plt.ylabel('WCSS')
plt.show()
```




```
for k in range(1,11):
  #data =X[X["cluster"]==k]
  plt.scatter(x["Age"],x["Spending Score (1-100)"])
  #plt.scatter(kmeans.cluster_centers+[: 0],kmeans.cluster_centers_[:, 1],s=300,c-'red')
  plt.title("clusters idnetified by k-mewans Clustering")
plt.ylabel("Spending Score (1-100)")
plt.xlabel("Age")
plt.show()
```


clusters idnetified by k-mewans Clustering
Spending Score (1-100)
Age
100
80
60
40
20
0
20
30
40
50
60
70