


```
import matplotlib.pyplot as plt
import seaborn as sns
import pandas as pd
df=pd.read_csv('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

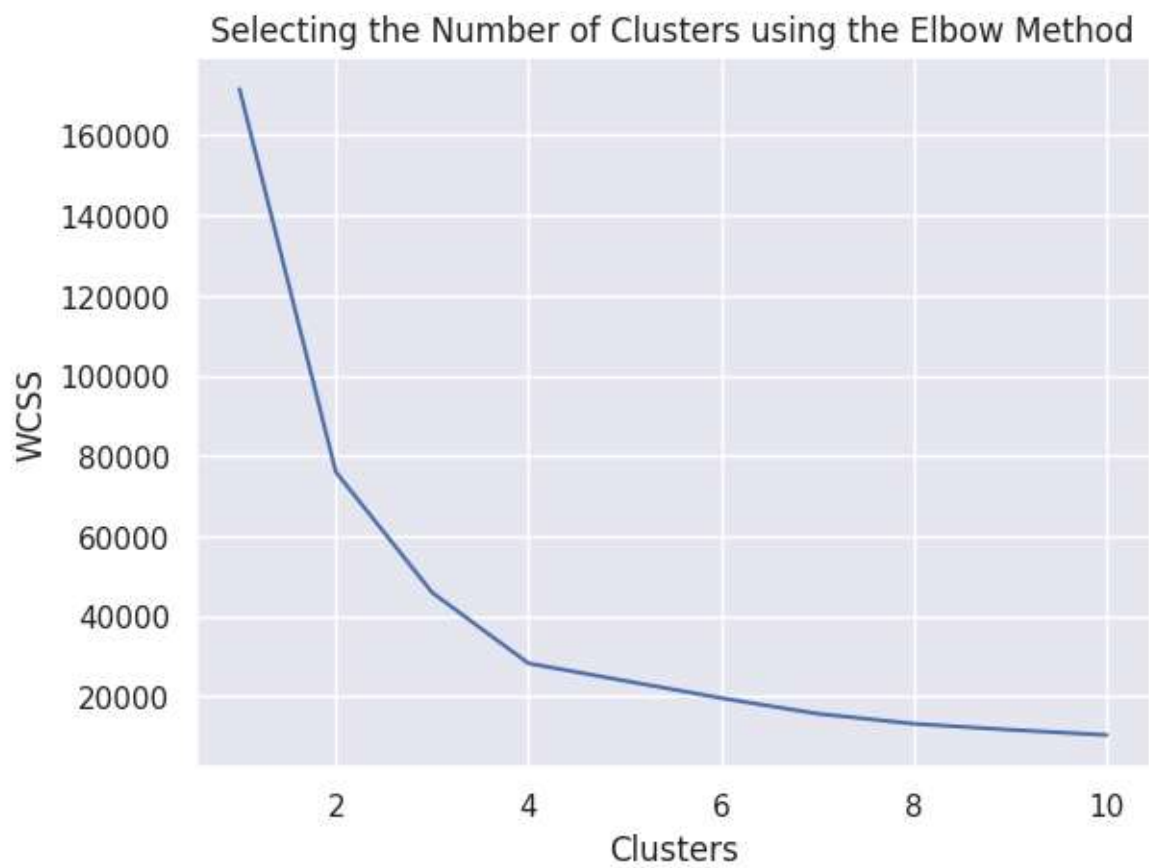
```
from sklearn.cluster import KMeans
X=df[['Age', 'Spending Score (1-100)']].copy()
```

Determine the number of Python Clusters

```
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()
```



```
plt.scatter(X["Age"],X["Spending Score (1-100)"])\nplt.title("Clusters Identified by K-Means Clustering")\nplt
```