




```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
from sklearn.cluster import KMeans
```

```
data = pd.read_csv('data.csv')
```

```
data.head()
```




	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	

Next steps:

 [View recommended plots](#)


[New interactive sheet](#)

```
data.shape
```



```
(200, 5)
```

```
data.isnull().sum()
```

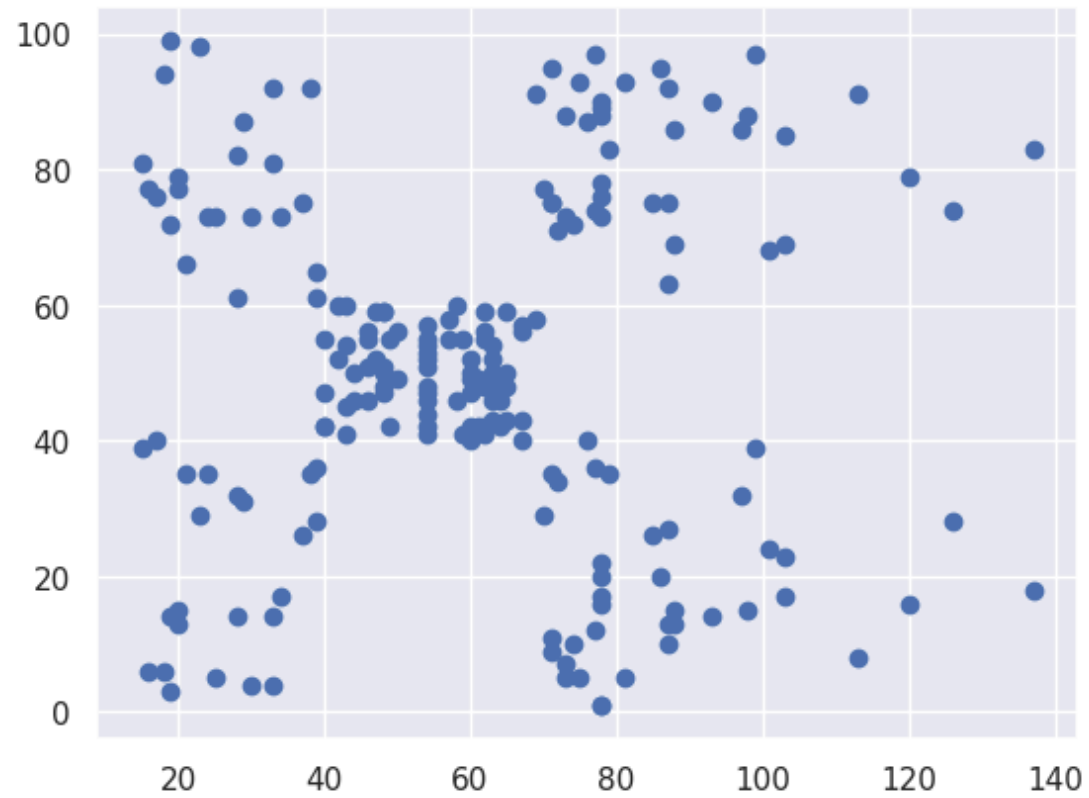


	0
CustomerID	0
Gender	0
Age	0
Annual Income (k\$)	0
Spending Score (1-100)	0
dtype: int64	

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

```
plt.scatter(X[:, 0], X[:, 1])
```

↗ <matplotlib.collections.PathCollection at 0x7bab2caf1f50>



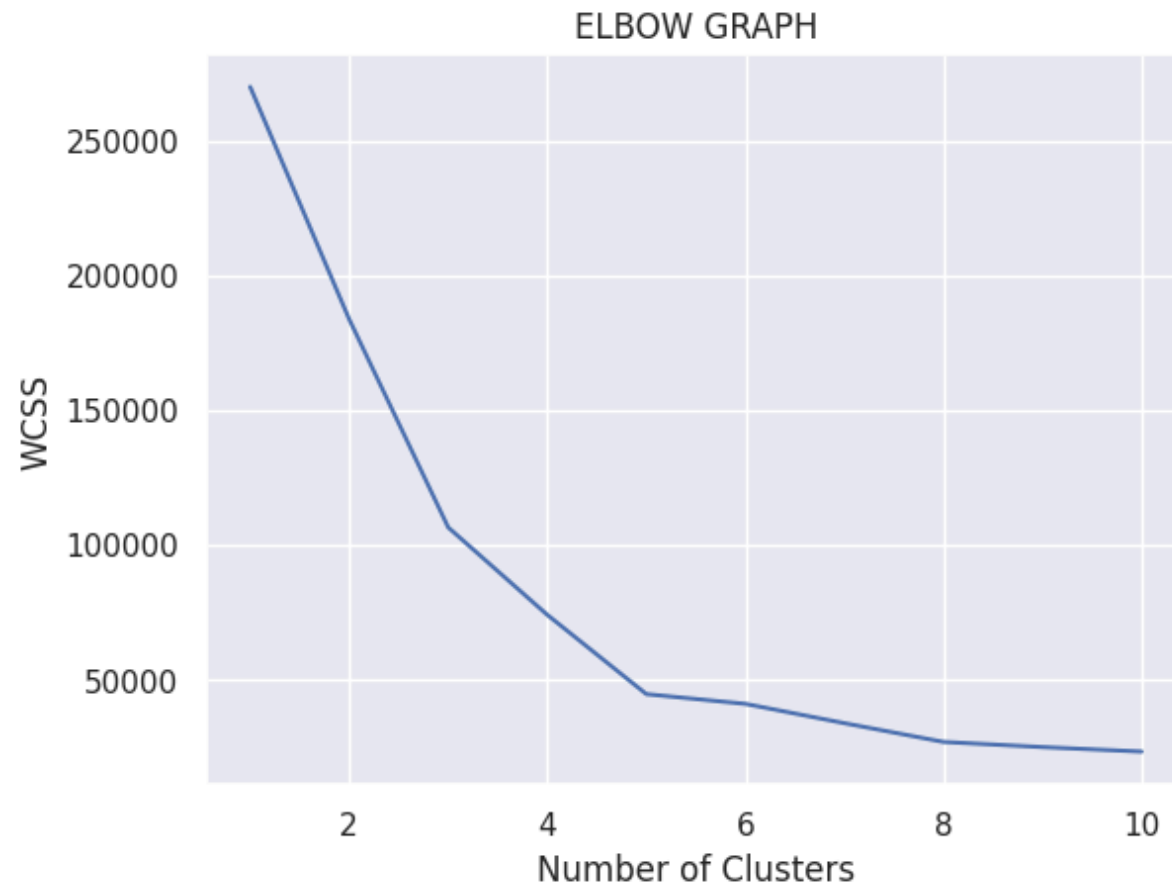
```
wcss = []

for i in range(1,11):
    km = KMeans(n_clusters=i , init='k-means++' , random_state=42)
    km.fit_predict(X)
    wcss.append(km.inertia_)
```

```
print(wcss)
```

↗ [269981.28000000014, 183653.3289473683, 106348.37306211119, 73880.64496247198, 44448.45544793369, 40825.16946386947, 33642.57922077922, 26686.837785187785, 247...

```
sns.set()  
plt.plot(range(1,11) , wcss)  
plt.title("ELBOW GRAPH")  
plt.xlabel("Number of Clusters")  
plt.ylabel("WCSS")  
plt.show()
```



```
kmeans = KMeans(n_clusters=5 , init='k-means++' , random_state=42)  
Y = kmeans.fit_predict(X)
```

Y

[illegible]

```
plt.figure(figsize=(8,8))
plt.scatter(X[Y==0,0], X[Y==0,1], s=50, c='green', label='Cluster 1')
plt.scatter(X[Y==1,0], X[Y==1,1], s=50, c='red', label='Cluster 2')
plt.scatter(X[Y==2,0], X[Y==2,1], s=50, c='yellow', label='Cluster 3')
plt.scatter(X[Y==3,0], X[Y==3,1], s=50, c='violet', label='Cluster 4')
plt.scatter(X[Y==4,0], X[Y==4,1], s=50, c='blue', label='Cluster 5')

plt.scatter(kmeans.cluster_centers_[ :,0], kmeans.cluster_centers_[ :,1], s=100, c='cyan', label='Centroids')

plt.title('Customer Groups')
plt.xlabel('Annual Income')
plt.ylabel('Spending Score')
plt.show()
```

