```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt


dataset = pd.read_csv('/content/drive/MyDrive/DataSet/Mall_Customers.csv')


df = dataset.copy()


df.head()
```

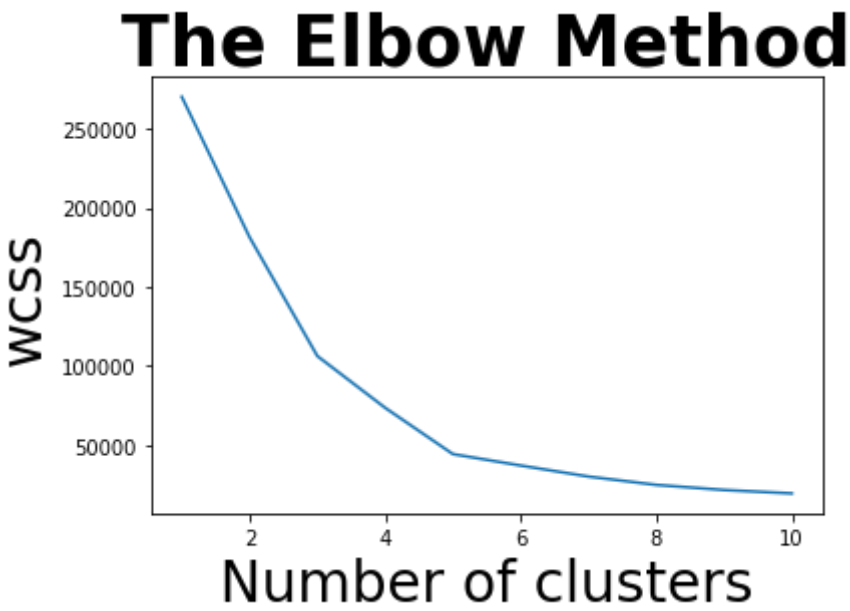
	CustomerID	Genre	Age	Annual Income (k$)	Spending Score (1-100)
0	1	Male	19	15	39
1	2	Male	21	15	81
2	3	Female	20	16	6
3	4	Female	23	16	77
4	5	Female	31	17	40

```
df.isnull().sum()
df.describe()
df.info()
```

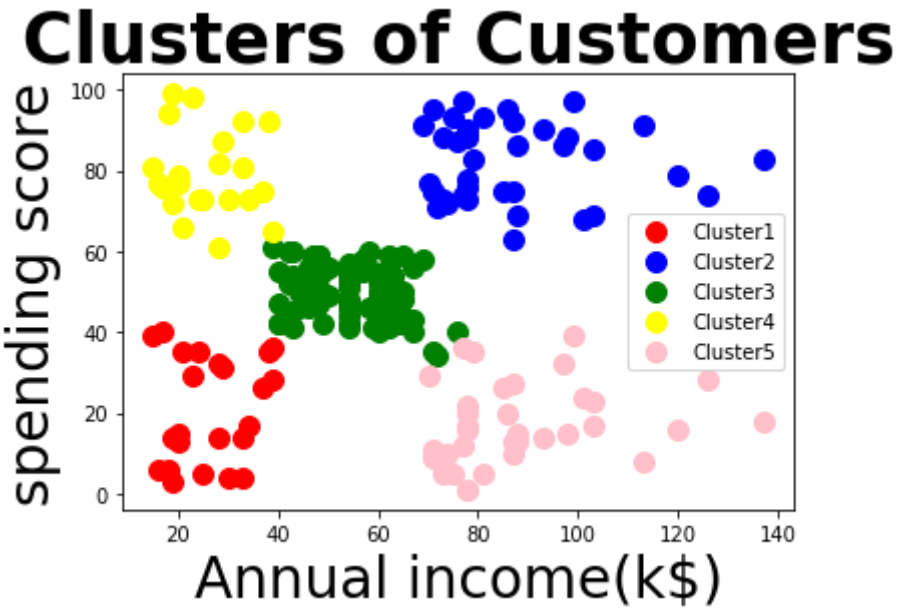
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 200 entries, 0 to 199
Data columns (total 5 columns):
 #   Column                  Non-Null Count  Dtype
---  ------                  --------------  -----
 0   CustomerID              200 non-null    int64
 1   Genre                   200 non-null    object
 2   Age                     200 non-null    int64
 3   Annual Income (k$)      200 non-null    int64
 4   Spending Score (1-100)  200 non-null    int64
dtypes: int64(4), object(1)
memory usage: 7.9+ KB
```

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


from sklearn.cluster import KMeans
wcss = []
for i in range(1, 11):
    kmeans = KMeans(n_clusters = i, init = 'k-means++', max_iter = 300, n_init = 10)
    kmeans.fit(X)
    wcss.append(kmeans.inertia_)
font_title = {'family' : 'normal',
        'weight' : 'bold',
        'size'   : 35}
font_axes = {'family' : 'normal',
        'weight' : 'normal',
```

```
        'size'   : 28}

plt.plot(range(1, 11), wcss)
plt.title('The Elbow Method', **font_title)
plt.xlabel('Number of clusters', **font_axes)
plt.ylabel('wcss', **font_axes)
plt.show()
```




```
#Taking number of clusters = 5
kmeans = KMeans(n_clusters = 5, init = 'k-means++', max_iter = 300, n_init = 10)
y_kmeans = kmeans.fit_predict(X)
# PLotting the clusters
plt.scatter(X[y_kmeans == 0, 0], X[y_kmeans == 0, 1], s = 100, c = 'red', label = 'Cluster
plt.scatter(X[y_kmeans == 1, 0], X[y_kmeans == 1, 1], s = 100, c = 'blue', label = 'Cluste
plt.scatter(X[y_kmeans == 2, 0], X[y_kmeans == 2, 1], s = 100, c = 'green', label = 'Clust
plt.scatter(X[y_kmeans == 3, 0], X[y_kmeans == 3, 1], s = 100, c = 'yellow', label = 'Clus
plt.scatter(X[y_kmeans == 4, 0], X[y_kmeans == 4, 1], s = 100, c = 'pink', label = 'Cluste
plt.title('Clusters of Customers', **font_title)
plt.xlabel('Annual income(k$)', **font_axes)
plt.ylabel('spending score', **font_axes)
plt.legend()
plt.show()
```



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