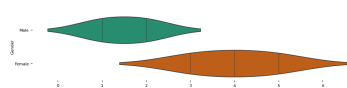```python
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

```python
df=pd.read_csv('/content/Mall_Customers.csv')
```
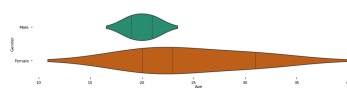
```python
df.head()
```

<string>:5: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed i

<string>:5: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed i
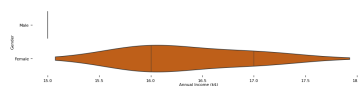
<string>:5: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed i

<string>:5: FutureWarning:

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|	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

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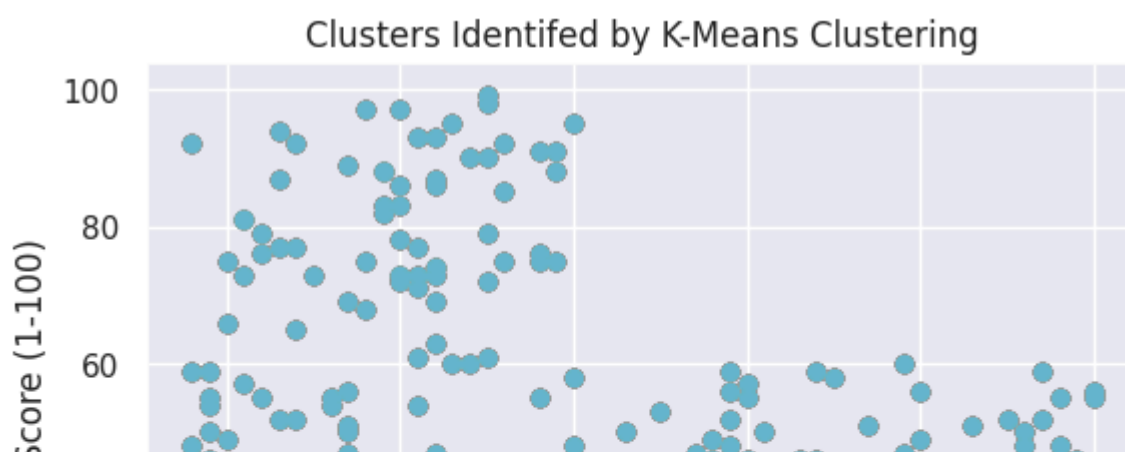
```
sns.set()
plt.plot(range(1,11),wcss)
plt.title('Selecting the Number of Clusters using the Elbow Method')
plt.xlabel('Clusters')
plt.ylabel('WCSS')
plt.show()
```


Selecting the Number of Clusters using the Elbow Method
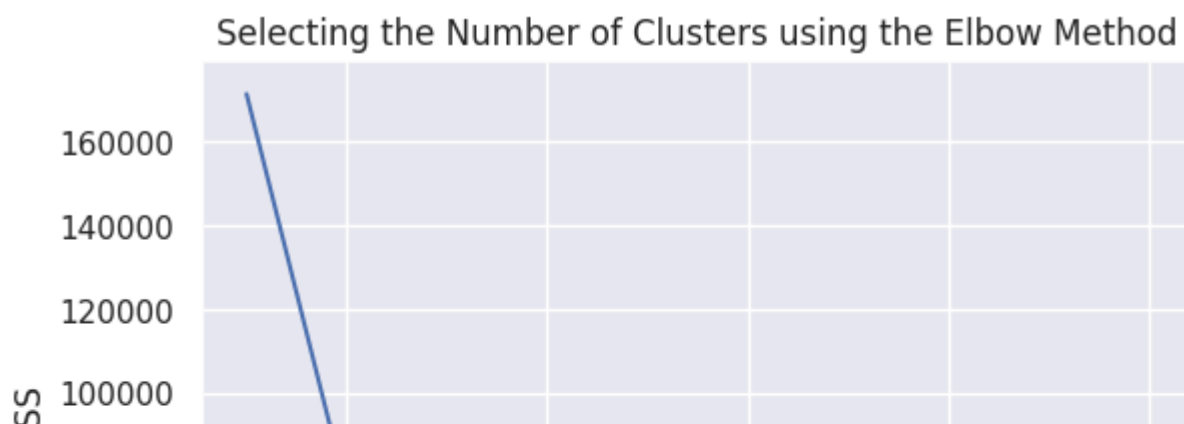
```
for k in range(1,11):
    plt.scatter(x["Age"],x['Spending Score (1-100)'])
    plt.title('Clusters Identifed by K-Means Clustering')
plt.ylabel("Spending Score (1-100)")
plt.xlabel("Age")
plt.show()
```


Clusters Identifed by K-Means Clustering

```python
for k in range(1,11):
```