

## Assignment on Clustering Techniques

This dataset gives the data of Income and money spent by the customers visiting a Shopping Mall. The data set contains Customer ID, Gender, Age, Annual Income, Spending Score. Therefore, as a mall owner you need to find the group of people who are the profitable customers for the mall owner. Apply at least two clustering algorithms (based on Spending Score) to find the group of customers.

1. Apply Data pre•processing (Label Encoding , Data Transformation. ) techniques if necessary.
2. Perform data•preparation( Train•Test Split)
3. Apply Machine Learning Algorithm
4. Evaluate Model.
5. Apply Cross•Validation and Evaluate Model

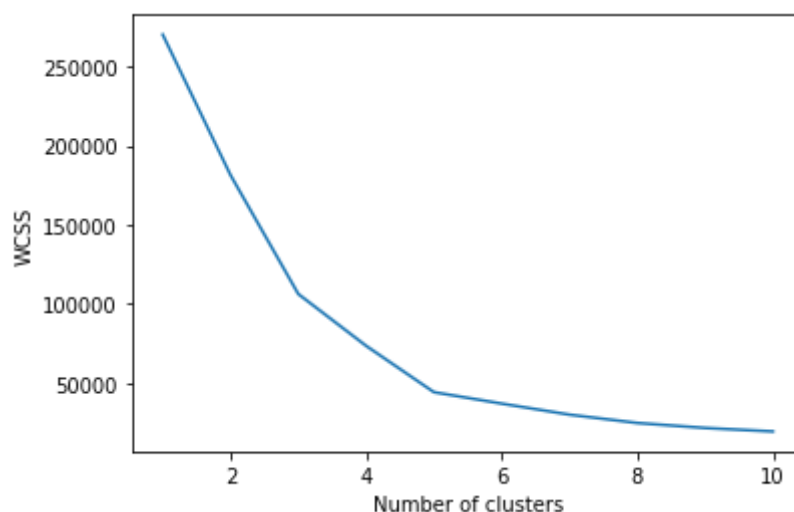
```
In [1]: import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
```

```
In [4]: dataset = pd.read_csv(r'C:\Users\User01\Downloads\archive (9)\Mall_Customers.csv')
X = dataset.iloc[:, [3, 4]].values
```

```
In [5]: from sklearn.cluster import KMeans
```

```
In [19]: wcss = []
for i in range(1, 11):
    kmeans = KMeans(n_clusters = i, init = 'k-means++', random_state = 42)
    kmeans.fit(X)
    wcss.append(kmeans.inertia_)
```

```
In [28]: plt.plot(range(1, 11), wcss)
plt.xlabel('Number of clusters')
plt.ylabel('WCSS')
plt.show()
```



```
In [29]: y_kmeans = kmeans.fit_predict(X)
```

```
In [30]: kmeans = KMeans(n_clusters = 5, init = 'k-means++', random_state = 42)
```

```
y_kmeans = kmeans.fit_predict(X)
```

```
In [44]: plt.scatter( X[y_kmeans == 1, 0], X[y_kmeans == 1, 1], s = 60, c = 'blue', label =
plt.scatter( X[y_kmeans == 0, 0], X[y_kmeans == 0, 1], s = 60, c = 'red', label =
plt.scatter( X[y_kmeans == 2, 0], X[y_kmeans == 2, 1], s = 60, c = 'green', label =
plt.scatter( kmeans.cluster_centers_[0, 0], kmeans.cluster_centers_[0, 1], s = 100,
plt.scatter( X[y_kmeans == 3, 0], X[y_kmeans == 3, 1], s = 60, c = 'violet', label =
plt.scatter( X[y_kmeans == 4, 0], X[y_kmeans == 4, 1], s = 60, c = 'yellow', label =
plt.xlabel('Annual Income (k$)')
plt.ylabel('Spending Score (1-100)')
plt.legend()

plt.show()
```

