

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

```
In [2]: dataset = pd.read_csv('CC_GENERAL.csv')
X = dataset.iloc[:, 1:].values
```

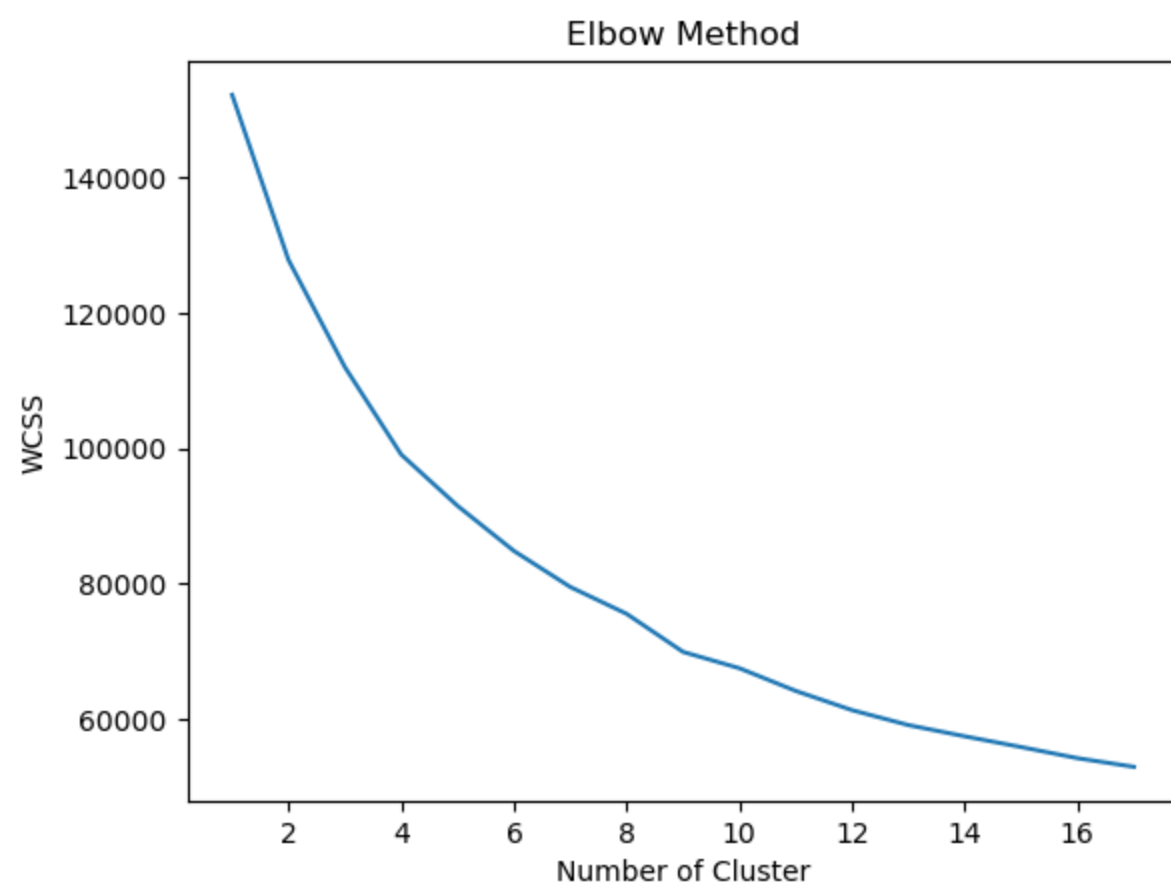
```
In [13]: from sklearn.impute import SimpleImputer
imputer = SimpleImputer(missing_values= np.NaN, strategy= 'mean', fill_value=None, verbose=0, copy=True)
imputer = imputer.fit(X)
X = imputer.transform(X)
```

C:\Users\Lenovo\anaconda3\lib\site-packages\sklearn\impute_base.py:382: FutureWarning: The 'verbose' parameter was deprecated in version 1.1 and will be removed in 1.3. A warning will always be raised upon the removal of empty columns in the future version.
warnings.warn(

```
In [14]: from sklearn.preprocessing import StandardScaler
sc_X = StandardScaler()
X = sc_X.fit_transform(X)
```

```
In [15]: from sklearn.cluster import KMeans
wcss = []
for i in range(1,18):
    kmeans = KMeans(n_clusters=i, init='k-means++', max_iter=300, n_init=10, random_state=0).fit(X)
    wcss.append(kmeans.inertia_)

plt.plot(range(1,18), wcss)
plt.title('Elbow Method')
plt.xlabel('Number of Cluster')
plt.ylabel('WCSS')
plt.show()
```



```
In [16]: kmeans = KMeans(n_clusters=8, init='k-means++', max_iter=300, n_init=10, random_state=0)
y_kmeans = kmeans.fit_predict(X)
```

```
In [17]: dataset['Cluster'] = y_kmeans
dataset.head()
```

```
Out[17]:
```

	CUST_ID	BALANCE	BALANCE_FREQUENCY	PURCHASES	ONEOFF_PURCHASES	INSTALLMENTS_PURCHASES	CASH_ADVANCE	PURCHASES_FREQUENCY	ONEOFF_PURCHASES_
0	C10001	40.900749	0.818182	95.40	0.00	95.4	0.000000	0.166667	
1	C10002	3202.467416	0.909091	0.00	0.00	0.0	6442.945483	0.000000	
2	C10003	2495.148862	1.000000	773.17	773.17	0.0	0.000000	1.000000	
3	C10004	1666.670542	0.636364	1499.00	1499.00	0.0	205.788017	0.083333	
4	C10005	817.714335	1.000000	16.00	16.00	0.0	0.000000	0.083333	

```
In [ ]:
```