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

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

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)

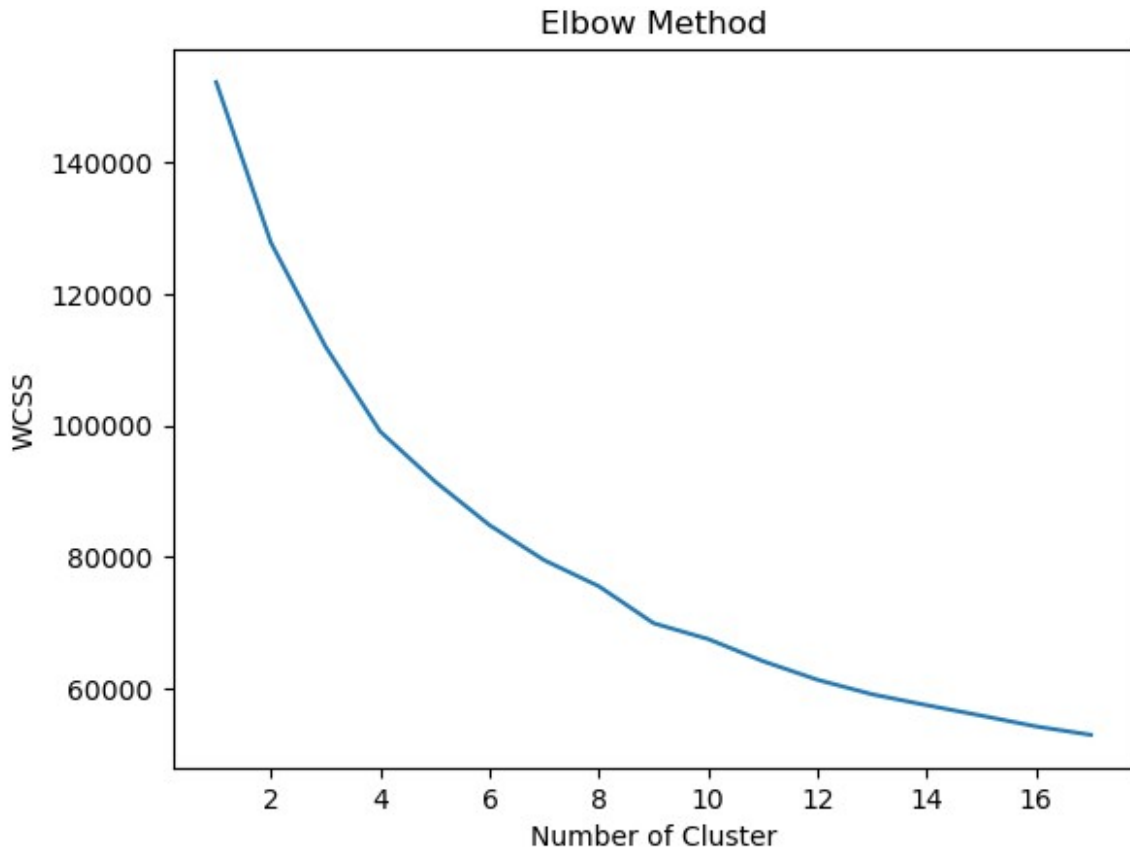
C:\Users\Lenovo\anaconda3\lib\site-packages\sklearn\impute\
_base.py:382: FutureWarning: The 'verbose' parameter was deprecated in
version 1.1 and will be removed in 1.3. A warning will always be
raised upon the removal of empty columns in the future version.
  warnings.warn(

from sklearn.preprocessing import StandardScaler
sc_X = StandardScaler()
X = sc_X.fit_transform(X)

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()

```



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

	CUST_ID	BALANCE	BALANCE_FREQUENCY	PURCHASES	ONEOFF_PURCHASES
0	C10001	40.900749	0.818182	95.40	0.00
1	C10002	3202.467416	0.909091	0.00	0.00
2	C10003	2495.148862	1.000000	773.17	773.17
3	C10004	1666.670542	0.636364	1499.00	1499.00
4	C10005	817.714335	1.000000	16.00	16.00

	INSTALLMENTS_PURCHASES	CASH_ADVANCE	PURCHASES_FREQUENCY
0	95.4	0.000000	0.166667
1	0.0	6442.945483	0.000000
2	0.0	0.000000	1.000000

3	0.0	205.788017	0.083333
4	0.0	0.000000	0.083333

	ONEOFF_PURCHASES_FREQUENCY	PURCHASES_INSTALLMENTS_FREQUENCY	\
0	0.000000		0.083333
1	0.000000		0.000000
2	1.000000		0.000000
3	0.083333		0.000000
4	0.083333		0.000000

	CASH_ADVANCE_FREQUENCY	CASH_ADVANCE_TRX	PURCHASES_TRX	CREDIT_LIMIT	\
0	0.000000	0	2	1000.0	
1	0.250000	4	0	7000.0	
2	0.000000	0	12	7500.0	
3	0.083333	1	1	7500.0	
4	0.000000	0	1	1200.0	

	PAYMENTS	MINIMUM_PAYMENTS	PRC_FULL_PAYMENT	TENURE	Cluster
0	201.802084	139.509787	0.000000	12	0
1	4103.032597	1072.340217	0.222222	12	3
2	622.066742	627.284787	0.000000	12	5
3	0.000000	NaN	0.000000	12	0
4	678.334763	244.791237	0.000000	12	0