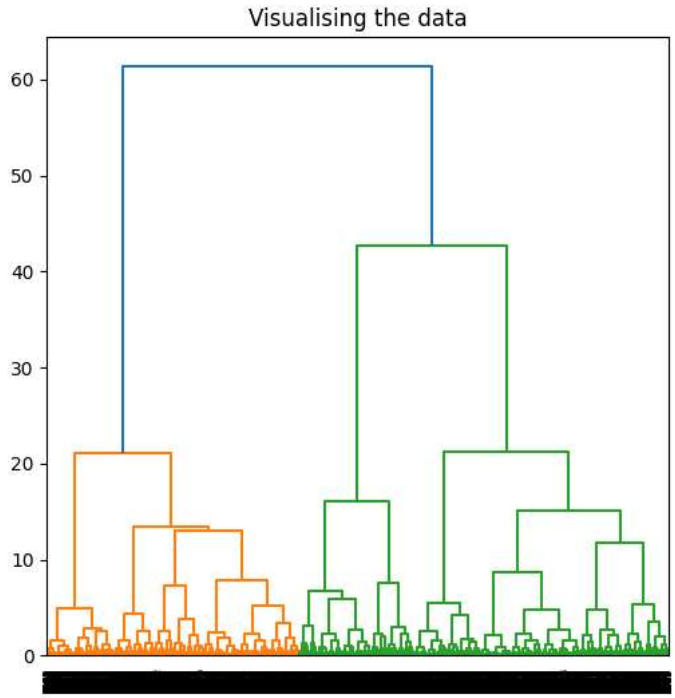
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt

from sklearn.cluster import AgglomerativeClustering
from sklearn.preprocessing import StandardScaler, normalize
from sklearn.decomposition import PCA
from sklearn.metrics import silhouette_score
import scipy.cluster.hierarchy as shc


raw_df = pd.read_csv('/CC GENERAL.csv')
raw_df = raw_df.drop('CUST_ID', axis = 1)
raw_df.fillna(method ='ffill', inplace = True)
raw_df.head(2)
```

	BALANCE	BALANCE_FREQUENCY	PURCHASES	ONEOFF_PURCHASES	INSTALLMENTS_PURCHASES	CASH_ADVANCE	PURCHASES_FREQUENCY	ONEOFF_PURCHA
0	40.900749	0.818182	95.4	0.0	95.4	0.000000	0.166667	
1	3202.467416	0.909091	0.0	0.0	0.0	6442.945483	0.000000	

```
# Standardize data
scaler = StandardScaler()
scaled_df = scaler.fit_transform(raw_df)

# Normalizing the Data
normalized_df = normalize(scaled_df)

# Converting the numpy array into a pandas DataFrame
normalized_df = pd.DataFrame(normalized_df)

# Reducing the dimensions of the data
pca = PCA(n_components = 2)
X_principal = pca.fit_transform(normalized_df)
X_principal = pd.DataFrame(X_principal)
X_principal.columns = ['P1', 'P2']

X_principal.head(2)
```

	P1	P2
0	-0.489949	-0.679976
1	-0.519099	0.544828

```
plt.figure(figsize =(6, 6))
plt.title('Visualising the data')
Dendrogram = shc.dendrogram((shc.linkage(X_principal, method ='ward')))
```



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