Code:

```
import pandas as pd
import matplotlib.pylab as plt

Univ1 = pd.read_excel("C:\\Users\cse-18\Downloads\University_Clustering.xlsx")

Univ1.describe()
Univ1.info()

Univ = Univ1.drop(["State"], axis=1)

# Normalization function
def norm_func(i):
    x = (i-i.min()) / (i.max()-i.min())
    return (x)

# Normalized data frame (considering the numerical part of data)
df_norm = norm_func(Univ.iloc[:, 1:])
df_norm.describe()

# for creating dendrogram
from scipy.cluster.hierarchy import linkage
import scipy.cluster.hierarchy as sch

z = linkage(df_norm, method = "complete", metric = "euclidean")

# Dendrogram
plt.figure(figsize=(15, 8));plt.title('Hierarchical Clustering
Dendrogram');plt.xlabel('Index');plt.ylabel('Distance')
sch.dendrogram(z,
    leaf_rotation = 0,  # rotates the x axis labels
    leaf_font_size = 10 # font size for the x axis labels
)
plt.show()


# Now applying AgglomerativeClustering choosing 5 as clusters from the above dendrogram
from sklearn.cluster import AgglomerativeClustering

h_complete = AgglomerativeClustering(n_clusters = 3, linkage = 'complete', affinity =
"euclidean").fit(df_norm)
h_complete.labels_

cluster_labels = pd.Series(h_complete.labels_)

Univ['clust'] = cluster_labels # creating a new column and assigning it to new column

Univ1 = Univ.iloc[:, [7,0,1,2,3,4,5,6]]
```

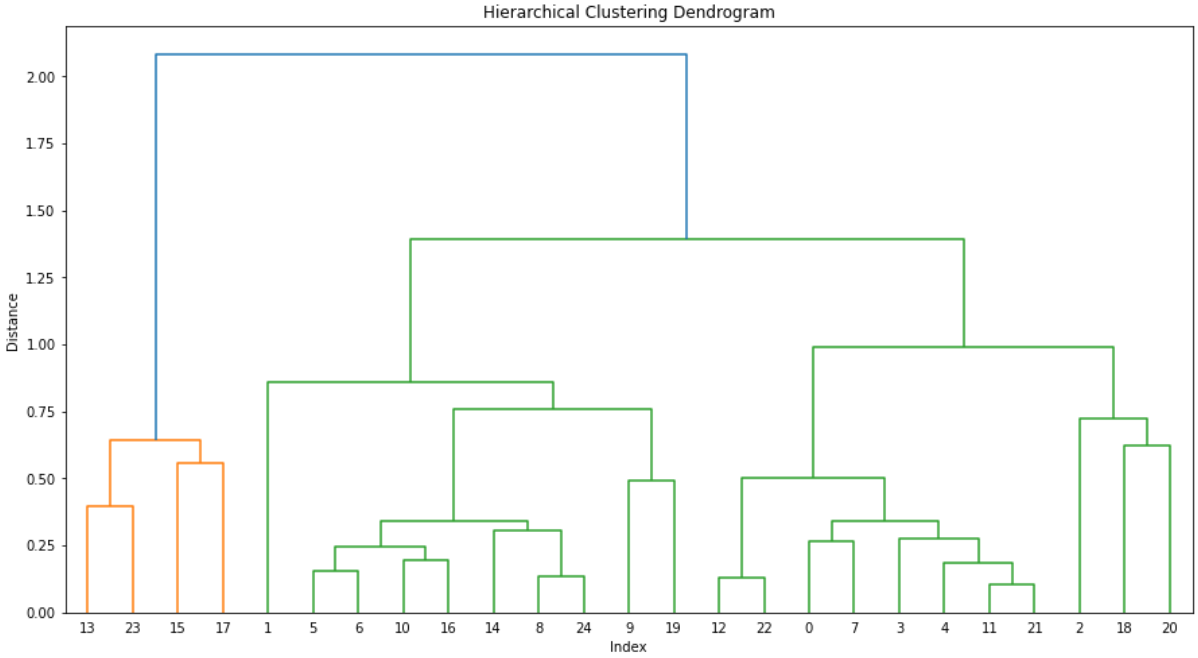
```
Univ1.head()

# Aggregate mean of each cluster
Univ1.iloc[:, 2:].groupby(Univ1.clust).mean()

# creating a csv file
Univ1.to_csv("University.csv", encoding = "utf-8")

import os
os.getcwd()
```

Output:



Hierarchical Clustering Dendrogram