```python
#Kmeans
from sklearn.cluster import KMeans
import pandas as pd
from sklearn.preprocessing import MinMaxScaler
from matplotlib import pyplot as plt
df = pd.read_csv("/Users/shridharmankar/Salary.csv")
df.head()


plt.scatter(df.Age,df['Salary'])
plt.xlabel('Age')
plt.ylabel('Salary')


km = KMeans(n_clusters=3)
predicted = km.fit_predict(df[['Age','Salary']])
predicted


df['cluster']=predicted
df1 = df[df.cluster==0]
df2 = df[df.cluster==1]
df3 = df[df.cluster==2]
plt.scatter(df1.Age,df1['Salary'],color='green')
plt.scatter(df2.Age,df2['Salary'],color='red')
plt.scatter(df3.Age,df3['Salary'],color='blue')
plt.xlabel('Age')
plt.ylabel('Salary')


scale = MinMaxScaler()

scale.fit(df[['Salary']])
df['Salary'] = scale.transform(df[['Salary']])

scale.fit(df[['Age']])
df['Age'] = scale.transform(df[['Age']])


km = KMeans(n_clusters=3)
predicted = km.fit_predict(df[['Age','Salary']])
predicted
```

```python
df = df.drop(['cluster'], axis='columns')


df['cluster']=predicted
df1 = df[df.cluster==0]
df2 = df[df.cluster==1]
df3 = df[df.cluster==2]
plt.scatter(df1.Age,df1['Salary'],color='green')
plt.scatter(df2.Age,df2['Salary'],color='red')
plt.scatter(df3.Age,df3['Salary'],color='blue')
plt.xlabel('Age')
plt.ylabel('Salary')

km.cluster_centers_



#Hierarchical
import matplotlib.pyplot as plt
import numpy as np
A = np.array([[5,3], [10,15],[15,12],[24,10],[30,30],[85,70],[71,80],[60,78],[70,55]])

plt.scatter(A[:,0],A[:,1])
plt.show()


from scipy.cluster.hierarchy import dendrogram, linkage
X = linkage(A, 'centroid')
dendrogram(X)
plt.show()

X = linkage(A, 'single')
dendrogram(X)
plt.show()


X = linkage(A, 'complete')
dendrogram(X)
plt.show()

X = linkage(A, 'average')
dendrogram(X)
plt.show()
```