**ESTIMATION AND MAXIMIZATION ALGORITHM:**

**CODE:**

from sklearn.mixture import GaussianMixture

import sklearn.metrics as metrics

import pandas as pd

import numpy as np

import matplotlib.pyplot as plt

# Read the dataset

dataset = pd.read\_csv("C:/Users/prith/desktop/MACHINE LEARNING/IRIS.csv")

X = dataset.iloc[:, :-1]

label = {'Iris-setosa': 0, 'Iris-versicolor': 1, 'Iris-virginica': 2}

y = dataset.iloc[:, -1].map(label) # Convert class labels to integer values

plt.figure(figsize=(14, 7))

colormap = np.array(['red', 'lime', 'black'])

# REAL PLOT

plt.subplot(1, 3, 1)

plt.title('Real')

plt.scatter(X.petal\_length, X.petal\_width, c=colormap[y]) # Use y as the class indices

gmm = GaussianMixture(n\_components=3, random\_state=0).fit(X)

y\_cluster\_gmm = gmm.predict(X)

# GMM Classification PLOT

plt.subplot(1, 3, 3)

plt.title('GMM Classification')

plt.scatter(X.petal\_length, X.petal\_width, c=colormap[y\_cluster\_gmm]) # Use y\_cluster\_gmm for colors

# Print metrics

print('The accuracy score of GMM:', metrics.accuracy\_score(y, y\_cluster\_gmm))

print('The Confusion matrix of GMM:\n', metrics.confusion\_matrix(y, y\_cluster\_gmm))

plt.tight\_layout()

plt.show()

**OUTPUT:**

=============================== RESTART: C:/Users/prith/Desktop/MACHINE LEARNING/ESTANDMAX.py ===============================

The accuracy score of GMM: 0.3333333333333333

The Confusion matrix of GMM:

[[ 0 50 0]

[45 0 5]

[ 0 0 50]]



