

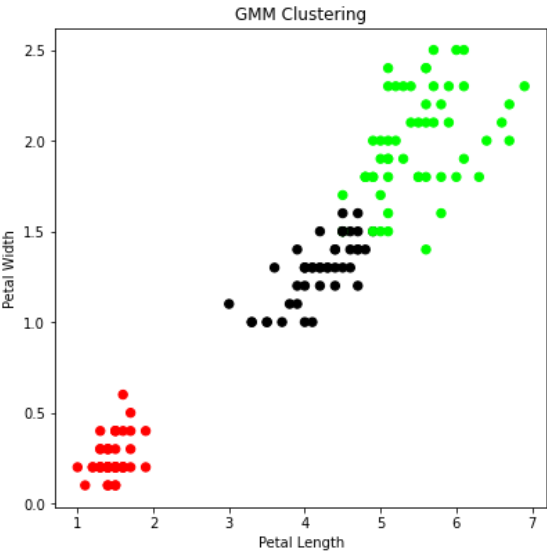
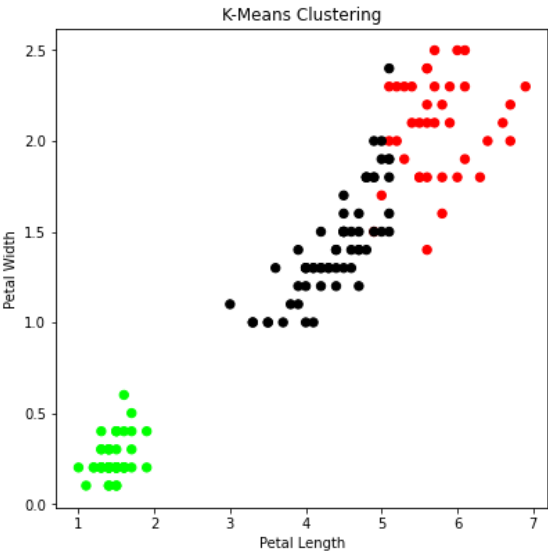
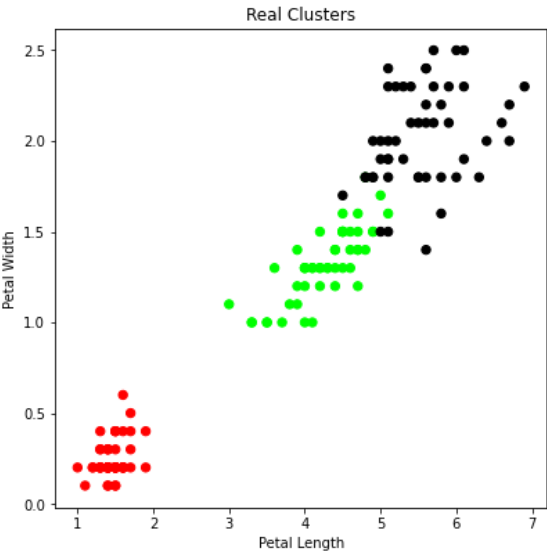
In [1]:

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1 import matplotlib.pyplot as plt
2 from sklearn import datasets
3 from sklearn.cluster import KMeans
4 import pandas as pd
5 import numpy as np
6 iris = datasets.load_iris()
7 X = pd.DataFrame(iris.data)
8 X.columns = ['Sepal_Length', 'Sepal_Width', 'Petal_Length', 'Petal_Width']
9 y = pd.DataFrame(iris.target)
10 y.columns = ['Targets']
11 model = KMeans(n_clusters=3)
12 model.fit(X)
13 plt.figure(figsize=(14,14))
14 colormap = np.array(['red', 'lime', 'black'])
15 plt.subplot(2, 2, 1)
16 plt.scatter(X.Petal_Length, X.Petal_Width, c=colormap[y.Targets], s=40)
17 plt.title('Real Clusters')
18 plt.xlabel('Petal Length')
19 plt.ylabel('Petal Width')
20 plt.subplot(2, 2, 2)
21 plt.scatter(X.Petal_Length, X.Petal_Width, c=colormap[model.labels_], s=40)
22 plt.title('K-Means Clustering')
23 plt.xlabel('Petal Length')
24 plt.ylabel('Petal Width')
25 from sklearn import preprocessing
26 scaler = preprocessing.StandardScaler()
27 scaler.fit(X)
28 xsa = scaler.transform(X)
29 xs = pd.DataFrame(xsa, columns = X.columns)
30 from sklearn.mixture import GaussianMixture
31 gmm = GaussianMixture(n_components=3)
32 gmm.fit(xs)
33 gmm_y = gmm.predict(xs)
34 plt.subplot(2, 2, 3)
35 plt.scatter(X.Petal_Length, X.Petal_Width, c=colormap[gmm_y], s=40)
36 plt.title('GMM Clustering')
37 plt.xlabel('Petal Length')
38 plt.ylabel('Petal Width')
39 print('Observation: The GMM using EM algorithm based clustering matched the true labels
40
41

```

Observation: The GMM using EM algorithm based clustering matched the true labels more closely than the Kmeans.



In []:

1