Project_4_3

July 28, 2020

1 Project 4.3. K-means and FCM clustering on iris datase

```python
[1]: # for importing iris dataset
     from sklearn import datasets

     # clustering algorithms
     from sklearn.cluster import KMeans
     from fcmeans import FCM

     # function for clustering validation
     from sklearn.metrics.cluster import adjusted_rand_score
     from sklearn.metrics.cluster import normalized_mutual_info_score
```

1.1 Load iris dataset from sklearn datasets

```python
[2]: iris = datasets.load_iris()
     X = iris.data
     y = iris.target
```

1.2 K-means clustering and it's validation

```python
[3]: clusters_numeber = 3
     k_means_model = KMeans(n_clusters=clusters_numeber)
     k_means_model.fit(X)
     k_means_labels = k_means_model.labels_
     print('targets:',y, end='\n'*3)
     print('clustered:',)

     k_means_RI = adjusted_rand_score(k_means_model.labels_, y)
     print('\nK-MeansRandom Index validation:', k_means_RI)

     k_means_NMI = normalized_mutual_info_score(k_means_labels, y)
     print('\nK-Means NMI validation: ', k_means_NMI)
```

```
targets: [0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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```

clustered:

K-MeansRandom Index validation: 0.7302382722834697

K-Means NMI validation: 0.7581756800057784

1.3   FCM clustering and it's validation

```python
fcm_model = FCM(n_clusters=3)
fcm_model.fit(X)
fcm_labels = fcm_model.u.argmax(axis=1)

print(y, end='\n'*2)
print(fcm_labels)

fcm_RI = adjusted_rand_score(fcm_labels, y)
print('\nFCM Random Index validation:', fcm_RI)

fcm_NMI = normalized_mutual_info_score(fcm_labels, y)
print('\nFCM NMI validation', fcm_NMI)
```

```
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 0 1]

FCM Random Index validation: 0.7294203486015404

FCM NMI validation 0.749623099014085
```