一、多种聚类方法对比

1.1 数据集展示

1.2对比

PYTHON

```
import matplotlib.pyplot as plt
import pandas as pd
import scipy.io as sio
from sklearn.cluster import k_means , DBSCAN , AgglomerativeClustering
from sklearn.mixture import GaussianMixture

mat = sio.loadmat('/root/pycharmDemo/ML/data/MLData/7/ex7data2.mat')
datapd = pd.DataFrame(mat['X'])

result_list = []
title_list = ['k_means','GaussianMixture','DBSCAN','AgglomerativeClust
# title_list = ['k均值','混合高斯','密度','层次']
model = k_means(datapd[[0,1]],n_clusters=3)
result_list.append([model[1]])
result = GaussianMixture(n_components=3).fit_predict(datapd[[0,1]])
result_list.append([result])
result = DBSCAN(min_samples=3).fit_predict(datapd[[0,1]])
result_list.append([result])
result = AgglomerativeClustering(n_clusters=3).fit_predict(datapd[[0,1
result_list.append([result])
for i in range(4):
    plt.subplot(2,2,i+1)
    plt.scatter(datapd[0], datapd[1], s=25, c=result_list[i], cmap='cc
    plt.title(title_list[i])
plt.show()```
![[Pasted image 20220406173811.png]]


# 二、图片压缩
```python
# 使用k-means进行图片压缩
```
```

```
from sklearn.cluster import k_means ,KMeans
import cv2
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd


img = plt.imread('/root/pycharmDemo/ML/data/MLData/7/bird_small.png')

plt.subplot(1,2,1)
plt.imshow(img)
plt.subplot(1,2,2)

# 如果原图片是0-255的图片需要让他归一化
# img = img / 255
km = KMeans(n_clusters=16)
result = km.fit_predict(img.reshape(-1,3))
newimg = km.cluster_centers_[result]
# 将图片不同的点聚成16簇，然后将图片的每一个点都使用16簇中心的点替代，就会生
newimg = newimg.reshape(img.shape)
plt.imshow(newimg)
# plt.imsave("newimg.png",newimg)
plt.show()```
![[Pasted image 20220406173748.png]]
```