Python code

- 轉折判斷法

```
print('Distortion: %.2f' % km.inertia_)


distortions = []
for i in range(1, 11):
    km = KMeans(n_clusters=i,
                init='k-means++',
                n_init=10,
                max_iter=300,
                random_state=0)
    km.fit(X)
    distortions.append(km.inertia_)
plt.plot(range(1, 11), distortions, marker='o')
plt.xlabel('Number of clusters')
plt.ylabel('Distortion')
plt.show()
```

群內誤差平方和
SSE

Python code - 聚類方法的比較

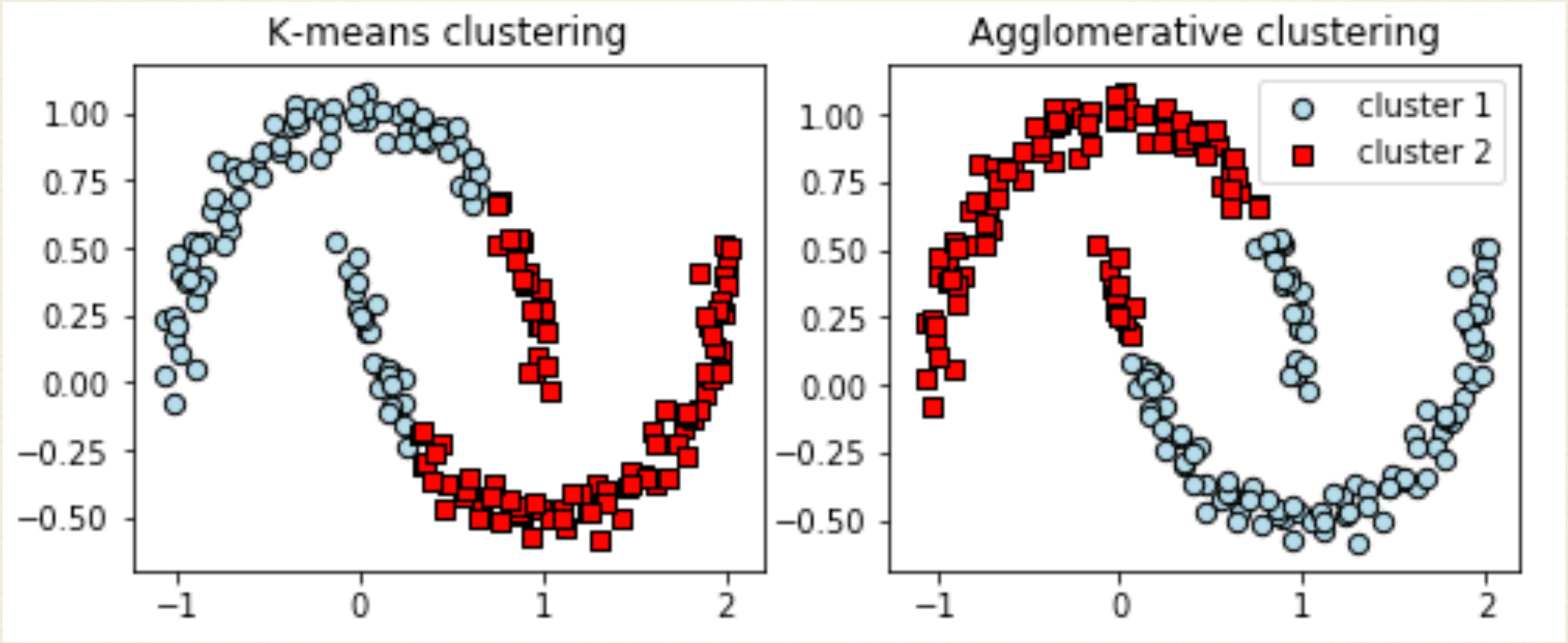
- K-means和 Complete linkage

```
from sklearn.cluster import AgglomerativeClustering
f, (ax1, ax2) = plt.subplots(1, 2, figsize=(8, 3))

km = KMeans(n_clusters=2, random_state=0)
y_km = km.fit_predict(X)
ax1.scatter(X[y_km == 0, 0], X[y_km == 0, 1],
            edgecolor='black',
            c='lightblue', marker='o', s=40, label='cluster 1')
ax1.scatter(X[y_km == 1, 0], X[y_km == 1, 1],
            edgecolor='black',
            c='red', marker='s', s=40, label='cluster 2')
ax1.set_title('K-means clustering')

ac = AgglomerativeClustering(linkage = 'complete',
                             affinity = 'euclidean',
                             n_clusters = 2)
y_ac = ac.fit_predict(X)
ax2.scatter(X[y_ac == 0, 0], X[y_ac == 0, 1], c='lightblue',
            edgecolor='black',
            marker='o', s=40, label='cluster 1')
ax2.scatter(X[y_ac == 1, 0], X[y_ac == 1, 1], c='red',
            edgecolor='black',
            marker='s', s=40, label='cluster 2')
ax2.set_title('Agglomerative clustering')
```

Python code - 聚類方法的比較



Python code - 聚類方法的比較

- DBSCAN

```
from sklearn.cluster import DBSCAN
db = DBSCAN(eps=0.2, min_samples=5, metric='euclidean')
y_db = db.fit_predict(X)
plt.scatter(X[y_db == 0, 0], X[y_db == 0, 1],
            c='lightblue', marker='o', s=40,
            edgecolor='black',
            label='cluster 1')
plt.scatter(X[y_db == 1, 0], X[y_db == 1, 1],
            c='red', marker='s', s=40,
            edgecolor='black',
            label='cluster 2')
plt.legend()
plt.show()
```

Python code - 聚類方法的比較

- DBSCAN