

```
In [7]: 1 from sklearn import datasets
2 from sklearn.cluster import KMeans
3 from sklearn.metrics import silhouette_score ,silhouette_samples
4 iris=datasets.load_iris()
5 x=iris.data
```

```
In [19]: 1 km = KMeans(n_clusters=3)
2 km.fit_predict(x)
3 score = silhouette_score(x , km.labels_ , metric='euclidean')
4 print('Silhouette score is %.3f' % score)
```

Silhouette score is 0.553

C:\Users\CompLab05\anaconda3\lib\site-packages\sklearn\cluster_kmeans.py:1416: FutureWarning: The default value of `n_init` will change from 10 to 'auto' in 1.4. Set the value of `n_init` explicitly to suppress the warning

```
super()._check_params_vs_input(X, default_n_init=10)
C:\Users\CompLab05\anaconda3\lib\site-packages\sklearn\cluster\_kmeans.py:1440: UserWarning: KMeans is known to have a memory leak on Windows with MKL, when there are less chunks than available threads. You can avoid it by setting the environment variable OMP_NUM_THREADS=1.
warnings.warn(
```

```
In [11]: 1 sample = silhouette_samples(x , km.labels_ , metric='euclidean')
2 print('\nSilhouette sample is:\n ',sample)
```

Silhouette sample is:

```
[0.85295506 0.81549476 0.8293151 0.80501395 0.8493016 0.74828037
0.82165093 0.85390505 0.75215011 0.825294 0.80310303 0.83591262
0.81056389 0.74615046 0.70259371 0.64377156 0.77568391 0.85101831
0.70685782 0.82030124 0.78418399 0.82590584 0.79297218 0.7941134
0.77503635 0.79865509 0.83346695 0.84201773 0.84364429 0.81784646
0.81518962 0.79899235 0.76272528 0.72224615 0.82877171 0.83224831
0.79415322 0.84188954 0.76856774 0.85033231 0.84941579 0.63900017
0.78657771 0.80023815 0.74698726 0.80977534 0.81340268 0.81902059
0.8182324 0.85209835 0.02672203 0.38118643 0.05340075 0.59294381
0.36885321 0.59221025 0.28232583 0.26525405 0.34419223 0.57829491
0.37478707 0.58710354 0.55107857 0.48216686 0.56310057 0.32459291
0.55751057 0.61072967 0.46149897 0.6115753 0.32909528 0.58968904
0.31046301 0.49424779 0.5000461 0.38548959 0.12629433 0.11798213
0.55293611 0.5069822 0.59466094 0.5607585 0.61972579 0.26087292
0.54077013 0.41598629 0.16655431 0.48935747 0.60716023 0.61436443
0.59560929 0.50352722 0.62444848 0.29362234 0.62754454 0.60657448
0.62205599 0.55780204 0.14131742 0.63064081 0.49927538 0.23225278
0.61193633 0.36075942 0.5577792 0.54384277 0.46682151 0.55917348
0.44076207 0.56152256 0.26062588 0.22965423 0.55509948 0.28503067
0.02635881 0.39825264 0.42110831 0.49486598 0.48341063 0.32868889
0.6070348 0.33355947 0.51237366 0.20297372 0.580154 0.57818326
0.30904249 0.25226992 0.45434264 0.51608826 0.56017398 0.48442397
0.46255248 0.13900039 0.05328614 0.55186784 0.45549975 0.3887791
0.35124673 0.53444618 0.5702338 0.41025549 0.23225278 0.61324746
0.5670778 0.42513648 0.10417086 0.31493016 0.35245379 0.18544229]
```

In []:

1