```
import matplotlib as plt
from sklearn.datasets import make_blobs
from sklearn.cluster import KMeans
from sklearn.metrics import silhouette_score
from sklearn.preprocessing import StandardScaler


features, true_label = make_blobs(
    n_samples=18,
    centers=5,
    cluster_std=8,
    random_state=42
)


features[:10]
```

```
array([[  1.09711398,   1.75262199],
       [ -2.25796846,  -2.44322628],
       [ -0.57349945,  -6.29195583],
       [-16.30854028,   4.51598589],
       [ -2.62431377,  -9.32525993],
       [  7.93003287,   5.53239781],
       [ 16.36506899,   0.16695928],
       [-11.69328009,   7.93811588],
       [ -6.26499271,  13.35476648],
       [-11.68473671,  -9.21365959]])
```

```
true_label[:200]
```

```
array([4, 3, 0, 0, 1, 4, 1, 2, 0, 2, 2, 2, 1, 1, 3, 0, 3, 4])
```

```
standard_skala = StandardScaler()
skala_fitur = standard_skala.fit_transform(features)


skala_fitur[:10]
```

```
array([[ 0.69261685,  0.32324795],
       [ 0.28374563, -0.30543511],
       [ 0.4890255 , -0.8821078 ],
       [-1.42854446,  0.73729536],
       [ 0.23910051, -1.33660157],
       [ 1.52531885,  0.88958899],
       [ 2.55326483,  0.08566088],
       [-0.86610014,  1.25004869],
       [-0.20457527,  2.06165013],
       [-0.86505899, -1.31987999]])
```

```
metode_kmeans = KMeans(
    init="random",
    n_clusters=5,
    n_init=10,
    max_iter=100,
    random_state=41
    )


metode_kmeans.fit(skala_fitur)
```

```
KMeans(init='random', max_iter=100, n_clusters=5, n_init=10, random_state=41)
```

```
metode_kmeans.inertia_
```

```
6.355831341732381
```

```
metode_kmeans.cluster_centers_
```

```
array([[ 0.55051678, -0.96891574],
       [ 2.55326483,  0.08566088],
       [-0.50841527,  1.09252539],
       [ 1.10896785,  0.60641847],
       [-0.78455521, -0.79559744]])
```

```
metode_kmeans.n_iter_
```

```
2
```

```
metode_kmeans.labels_
```

```
array([3, 0, 0, 2, 0, 3, 1, 2, 2, 4, 4, 4, 0, 2, 4, 2, 4, 2], dtype=int32)
```

```
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
```

```
color = np.array(["Red","Green","Blue","yellow","brown"])
plt.subplot(1,2,2)
plt.scatter(skala_fitur[:,0], skala_fitur[:,1], s=50, alpha=1, cmap='viridis', c=color[metode_kmeans.labels_])
```

```
<ipython-input-14-860e6561b51d>:3: UserWarning: No data for colormapping provided via 'c'. Parameters 'cmap' will be ignored
  plt.scatter(skala_fitur[:,0], skala_fitur[:,1], s=50, alpha=1, cmap='viridis', c=color[metode_kmeans.labels_])
<matplotlib.collections.PathCollection at 0x795ec0e49f90>
```