In [1]:
```
import numpy as np
import pandas as pd
```

In [2]:
```
df = pd.read_csv('Mall_Customers.csv')
```

In [3]:
```
df.head()
```

Out[3]:

	CustomerID	Genre	Age	Annual Income (k$)	Spending Score (1-100)
0	1	Male	19	15	39
1	2	Male	21	15	81
2	3	Female	20	16	6
3	4	Female	23	16	77
4	5	Female	31	17	40

In [4]:
```
X = df.iloc[:,[3,4]].values
```

In [5]:
```
from sklearn.cluster import DBSCAN
```

In [7]:
```
dbscan = DBSCAN(eps = 3, min_samples = 4)
```

In [8]:
```
model = dbscan.fit(X)
```

In [10]:
```
labels = model.labels_
```

In [22]:
```
labels
```

Out[22]:
```
array([-1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1,
       -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1,
       -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1,
       -1, -1, -1, -1, -1,  0,  0,  0,  0, -1, -1,  0, -1,  0, -1,  0,  0,
       -1,  0, -1, -1,  0, -1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,  1,
        1,  1,  1, -1,  2,  1,  2,  2,  2,  2,  2,  2,  2,  2,  2,  2,  2,
        2,  2,  2,  2,  2,  2,  2,  2,  2,  2,  2,  2,  2,  2,  3,  2,
        3,  3, -1,  3, -1, -1,  4, -1, -1, -1,  4,  5,  4, -1,  4,  5, -1,
        5,  4, -1,  4,  5, -1, -1,  6, -1, -1, -1,  7, -1,  6, -1,  6, -1,
        7, -1,  6, -1,  7, -1,  7, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1,
        8, -1,  8, -1,  8, -1,  8, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1,
       -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1], dtype=int64)
```

In [12]:
```
from sklearn import metrics
```

In [14]:
```
sample_cores = np.zeros_like(labels , dtype = bool )
```

In [23]:
```
sample_cores
```

Out[23]:
```
array([False, False, False, False, False, False, False, False, False,
       False, False, False, False, False, False, False, False, False,
       False, False, False, False, False, False, False, False, False,
       False, False, False, False, False, False, False, False, False,
       False, False, False, False, False, False, False, False, False,
       False, False, False, False, False, False, False, False, False,
       False, False, False, False,  True,  True, False, False,  True,
       False,  True, False,  True,  True, False,  True, False, False,
        True, False,  True,  True,  True,  True,  True, False,  True,
        True, False,  True, False,  True, False,  True, False, False,
       False,  True,  True,  True,  True,  True,  True,  True,  True,
        True,  True,  True, False,  True,  True,  True,  True,  True,
        True,  True,  True,  True,  True,  True,  True,  True,  True,
       False, False,  True, False, False, False, False, False, False,
       False, False, False,  True, False,  True, False, False, False,
       False,  True,  True, False, False, False, False, False, False,
       False, False, False, False, False, False, False,  True, False,
        True, False,  True, False, False, False, False, False, False,
       False, False, False, False, False, False, False, False,  True,
       False, False, False, False, False, False, False, False, False,
       False, False, False, False, False, False, False, False, False,
       False, False, False, False, False, False, False, False, False,
       False, False])
```

In [17]:
```
sample_cores[dbscan.core_sample_indices_] = True
```

In [18]:
```
n_clusters = len(set(labels))-(1 if -1 in labels else 0)
```

In [21]:
```
print(metrics.silhouette_score(X,labels))
```

```
-0.1908319132560097
```

In [ ]:
```

```