Chapter 4 - Clustering Models

Segment 3 - DBSCan clustering to identify outliers

```
import pandas as pd

import matplotlib.pyplot as plt
from pylab import rcParams
import seaborn as sb

import sklearn
from sklearn.cluster import DBSCAN
from collections import Counter


%matplotlib inline
rcParams['figure.figsize'] = 5, 4
sb.set_style('whitegrid')
```

DBSCan clustering to identify outliers

Train your model and identify outliers

```
# with this example, we're going to use the same data that we used for the rest of this chapter. So we're going to copy and
# paste in the code.
address = 'C:/Users/Lillian/Desktop/ExerciseFiles/Data/iris.data.csv'
df = pd.read_csv(address, header=None, sep=',')

df.columns=['Sepal Length','Sepal Width','Petal Length','Petal Width', 'Species']

data = df.iloc[:,0:4].values
target = df.iloc[:,4].values

df[:5]
```

	Sepal Length	Sepal Width	Petal Length	Petal Width	Species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa

```
model = DBSCAN(eps=0.8,  min_samples=19).fit(data)
print(model)
```

```
DBSCAN(algorithm='auto', eps=0.8, leaf_size=30, metric='euclidean',
       metric_params=None, min_samples=19, n_jobs=None, p=None)
```

Visualize your results

```
outliers_df = pd.DataFrame(data)

print(Counter(model.labels_))

print(outliers_df[model.labels_ ==-1])
```

```
Counter({1: 94, 0: 50, -1: 6})
       0    1    2    3
98   5.1  2.5  3.0  1.1
105  7.6  3.0  6.6  2.1
117  7.7  3.8  6.7  2.2
118  7.7  2.6  6.9  2.3
122  7.7  2.8  6.7  2.0
131  7.9  3.8  6.4  2.0
```

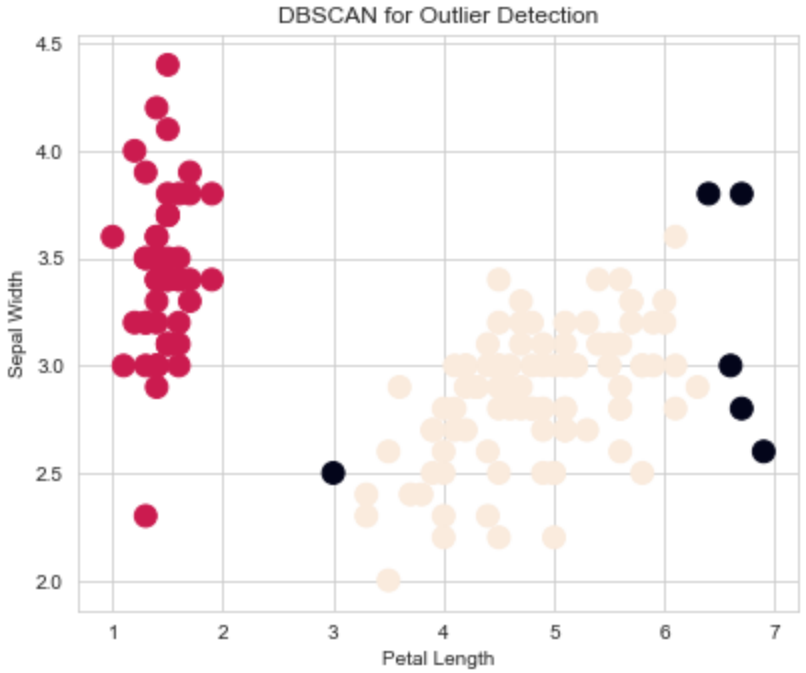
```
fig = plt.figure()
ax = fig.add_axes([.1, .1, 1, 1])

colors = model.labels_

ax.scatter(data[:,2], data[:,1], c=colors, s=120)
ax.set_xlabel('Petal Length')
```

```
ax.set_ylabel('Sepal Width')
plt.title('DBSCAN for Outlier Detection')
```

```
Text(0.5, 1.0, 'DBSCAN for Outlier Detection')
```



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