

```
In [1]: 1 import pandas as pd
        2 import numpy as np
        3 import seaborn as sns
        4 from sklearn.datasets import load_iris
        5 from sklearn.model_selection import train_test_split
        6 from matplotlib import pyplot as plt
        7 %matplotlib inline
```

C:\Users\admin\anaconda3\lib\site-packages\scipy\\_\_init\_\_.py:146: UserWarning: A NumPy version >=1.16.5 and <1.23.0 is required for this version of SciPy (detected version 1.23.5  
 warnings.warn(f"A NumPy version >={np\_minversion} and <{np\_maxversion}")

```
In [2]: 1 iris = load_iris()
        2 iris.feature_names
```

```
Out[2]: ['sepal length (cm)',
         'sepal width (cm)',
         'petal length (cm)',
         'petal width (cm)']
```

```
In [3]: 1 df = pd.DataFrame(iris.data, columns = iris.feature_names)
        2 df.head()
```

```
Out[3]:
```

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)
0	5.1	3.5	1.4	0.2
1	4.9	3.0	1.4	0.2
2	4.7	3.2	1.3	0.2
3	4.6	3.1	1.5	0.2
4	5.0	3.6	1.4	0.2

```
In [4]: 1 df['target'] = iris.target
        2 df.head()
```

```
Out[4]:
```

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)	target
0	5.1	3.5	1.4	0.2	0
1	4.9	3.0	1.4	0.2	0
2	4.7	3.2	1.3	0.2	0
3	4.6	3.1	1.5	0.2	0
4	5.0	3.6	1.4	0.2	0

In [5]: 1 df.tail()

Out[5]:

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)	target
145	6.7	3.0	5.2	2.3	2
146	6.3	2.5	5.0	1.9	2
147	6.5	3.0	5.2	2.0	2
148	6.2	3.4	5.4	2.3	2
149	5.9	3.0	5.1	1.8	2

In [6]: 1 iris.target\_names

Out[6]: array(['setosa', 'versicolor', 'virginica'], dtype='<U10')

In [7]: 1 df[df.target == 1].head()

Out[7]:

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)	target
50	7.0	3.2	4.7	1.4	1
51	6.4	3.2	4.5	1.5	1
52	6.9	3.1	4.9	1.5	1
53	5.5	2.3	4.0	1.3	1
54	6.5	2.8	4.6	1.5	1

In [8]: 1 df['flower\_name'] = df.target.apply(lambda x: iris.target\_names[x])  
2 df.head()

Out[8]:

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)	target	flower_name
0	5.1	3.5	1.4	0.2	0	setosa
1	4.9	3.0	1.4	0.2	0	setosa
2	4.7	3.2	1.3	0.2	0	setosa
3	4.6	3.1	1.5	0.2	0	setosa
4	5.0	3.6	1.4	0.2	0	setosa

In [9]: 1 df0 = df[df.target == 0]  
2 df1 = df[df.target == 1]  
3 df2 = df[df.target == 2]

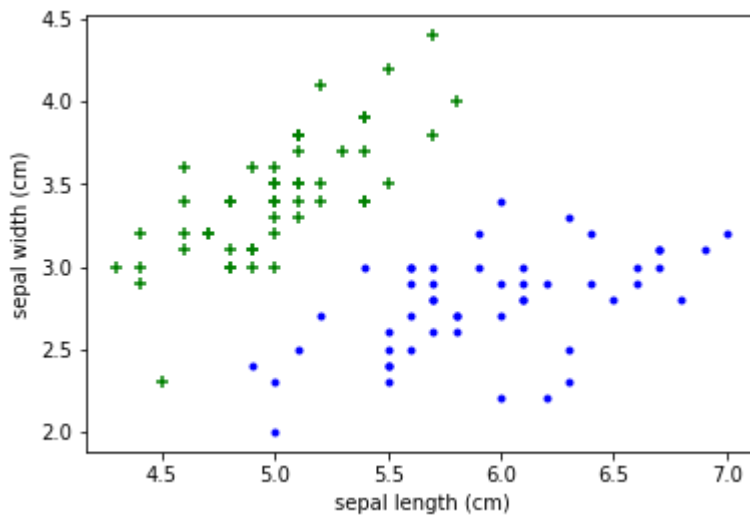
In [10]: 1 df0.head()

Out[10]:

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)	target	flower_name
0	5.1	3.5	1.4	0.2	0	setosa
1	4.9	3.0	1.4	0.2	0	setosa
2	4.7	3.2	1.3	0.2	0	setosa
3	4.6	3.1	1.5	0.2	0	setosa
4	5.0	3.6	1.4	0.2	0	setosa

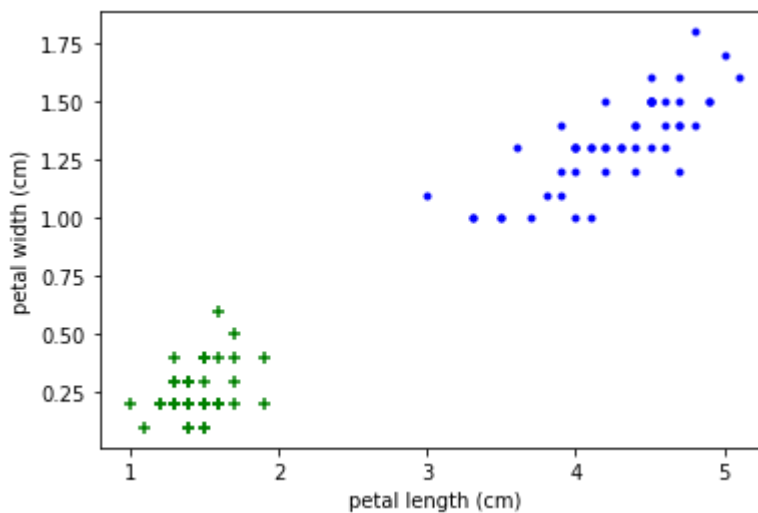
```
In [11]: 1 plt.xlabel('sepal length (cm)')
2 plt.ylabel('sepal width (cm)')
3 plt.scatter(df0['sepal length (cm)'], df0['sepal width (cm)'], color =
4 plt.scatter(df1['sepal length (cm)'], df1['sepal width (cm)'], color =
```

Out[11]: <matplotlib.collections.PathCollection at 0x2b985d84670>



```
In [12]: 1 plt.xlabel('petal length (cm)')
2 plt.ylabel('petal width (cm)')
3 plt.scatter(df0['petal length (cm)'], df0['petal width (cm)'], color =
4 plt.scatter(df1['petal length (cm)'], df1['petal width (cm)'], color =
```

Out[12]: <matplotlib.collections.PathCollection at 0x2b985e89cd0>



```
In [13]: 1 x = df[['sepal length (cm)', 'sepal width (cm)', 'petal length (cm)', '
2 y = df.target
```

```
In [14]: 1 x_train,x_test,y_train,y_test = train_test_split(x, y, test_size = 0.2)
```

```
In [15]: 1 len(x_train)
```

Out[15]: 120

```
In [16]: 1 len(x_test)
```

```
Out[16]: 30
```

```
In [18]: 1 from sklearn.svm import SVC
2 model = SVC(kernel = 'linear')
3 model.fit(x_train, y_train)
```

```
Out[18]: SVC(kernel='linear')
```

```
In [19]: 1 model.score(x_test, y_test)
```

```
Out[19]: 0.9
```

```
In [20]: 1 prediction = model.predict(x_test)
```

```
In [21]: 1 # Map class labels to target names
2 target_names = iris.target_names
3
4 # Print the class labels for the test set predictions
5 for p in prediction:
6     print(target_names[p])
```

```
setosa
setosa
versicolor
virginica
virginica
virginica
setosa
virginica
virginica
versicolor
virginica
versicolor
versicolor
versicolor
setosa
virginica
virginica
virginica
virginica
setosa
setosa
versicolor
setosa
versicolor
setosa
virginica
virginica
setosa
setosa
virginica
```

