In [1]:
```python
from sklearn.datasets import load_iris
iris_dataset = load_iris()
```

In [2]:
```python
print("Keys of iris_dataset: \n{}".format(iris_dataset.keys()))
```

```
Keys of iris_dataset:
dict_keys(['data', 'target', 'frame', 'target_names', 'DESCR', 'feature_names', 'filename'])
```

In [3]:
```python
print(iris_dataset['DESCR'][:193] + "\n...")
```

```
.. _iris_dataset:

Iris plants dataset
--------------------

**Data Set Characteristics:**

    :Number of Instances: 150 (50 in each of three classes)
    :Number of Attributes: 4 numeric, pre
...
```

In [4]:
```python
print("Target names: {}".format(iris_dataset['target_names']))
```

```
Target names: ['setosa' 'versicolor' 'virginica']
```

In [5]:
```python
print("Feature names: \n{}".format(iris_dataset['feature_names']))
```

```
Feature names:
['sepal length (cm)', 'sepal width (cm)', 'petal length (cm)', 'petal width (cm)']
```

In [6]:
```python
print("Type of data: {}".format(type(iris_dataset['data'])))
```

```
Type of data: <class 'numpy.ndarray'>
```

In [7]:
```python
print("Shape of data: {}".format(iris_dataset['data'].shape))
```

```
Shape of data: (150, 4)
```

In [8]:
```python
print("First five columns of data:\n{}".format(iris_dataset['data'][:5]))
```

```
First five columns of data:
[[5.1 3.5 1.4 0.2]
 [4.9 3.  1.4 0.2]
 [4.7 3.2 1.3 0.2]
 [4.6 3.1 1.5 0.2]
 [5.  3.6 1.4 0.2]]
```

In [9]:
```python
print("Type of target: {}".format(type(iris_dataset['target'])))
```

```
Type of target: <class 'numpy.ndarray'>
```

In [39]:
```python
print("Shape of target: {}".format(iris_dataset['target'].shape))
```

```
Shape of target: (150,)
```

In [11]:
```python
print("Target:\n{}".format(iris_dataset['target']))
```

```
Target:
[0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0 0 0 0 0 0 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 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 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]
```

In [12]:
```python
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(
iris_dataset['data'], iris_dataset['target'], random_state=0)
```

In [13]:
```python
print("X_train shape: {}".format(X_train.shape))
print("y_train shape: {}".format(y_train.shape))
```

```
X_train shape: (112, 4)
y_train shape: (112,)
```

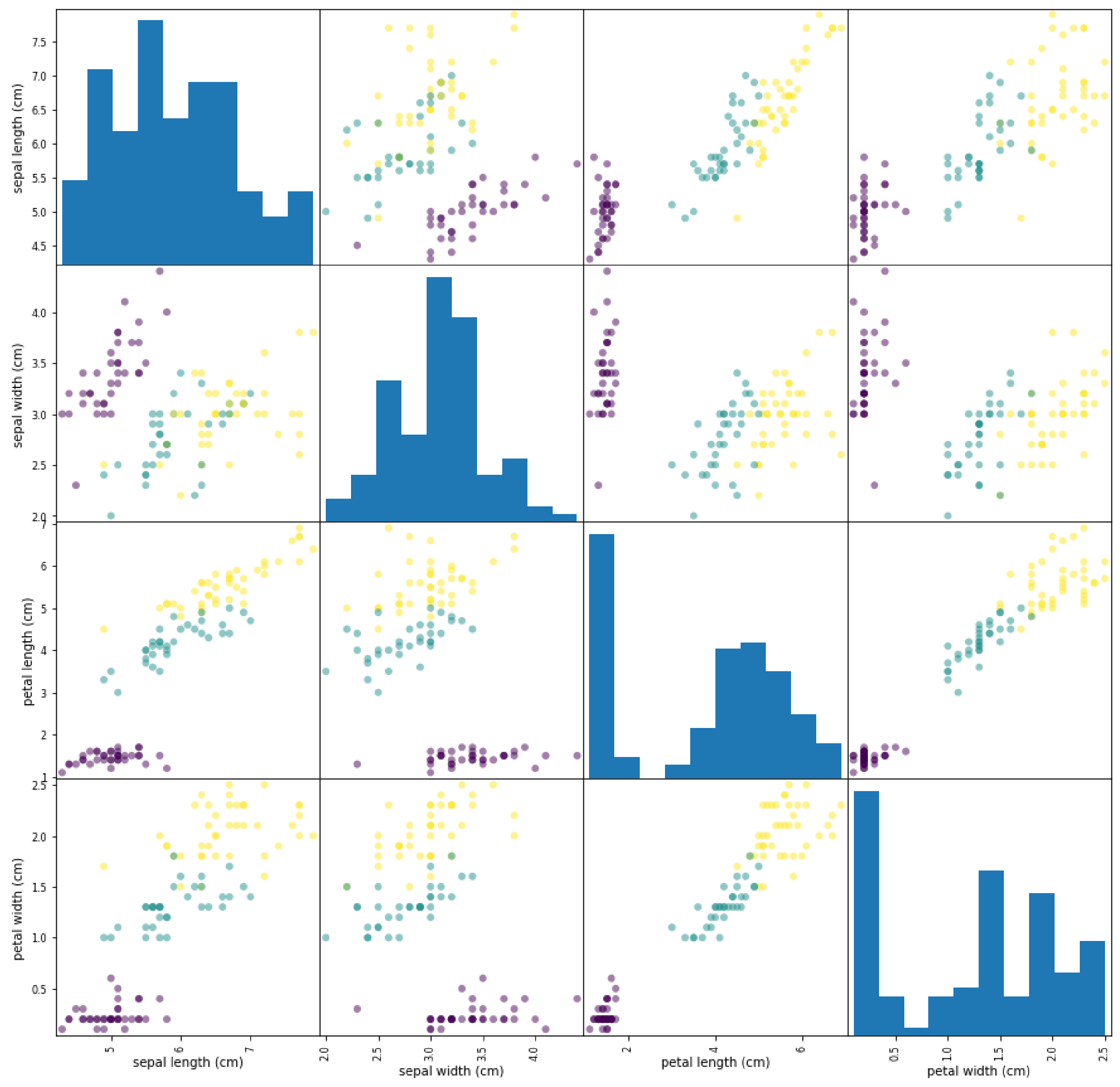
In [15]:
```python
print("X_test shape: {}".format(X_test.shape))
print("y_test shape: {}".format(y_test.shape))
```

```
X_test shape: (38, 4)
y_test shape: (38,)
```

In [24]:
```python
import numpy as np
import pandas as pd
import sklearn
from sklearn.datasets import load_iris
from sklearn.model_selection import train_test_split
from sklearn.neighbors import KNeighborsClassifier
from sklearn.metrics import classification_report
from sklearn.metrics import confusion_matrix
from sklearn.metrics import accuracy_score
```

In [26]:
```python
# create dataframe from data in X_train
# label the columns using the strings in iris_dataset.feature_names
iris_dataframe = pd.DataFrame(X_train, columns=iris_dataset.feature_names)
```

In [30]:
```python
# create a scatter matrix from the dataframe, color by y_train
grr = pd.plotting.scatter_matrix(iris_dataframe, c=y_train, figsize=(15, 15), marker='o')
```



In [31]:
```python
from sklearn.neighbors import KNeighborsClassifier
knn = KNeighborsClassifier(n_neighbors=1)
```

In [32]:
```python
knn.fit(X_train, y_train)
```

Out[32]:
```
KNeighborsClassifier(n_neighbors=1)
```

In [33]:
```python
X_new = np.array([[5, 2.9, 1, 0.2]])
print("X_new.shape: {}".format(X_new.shape))
```

```
X_new.shape: (1, 4)
```

In [34]:
```python
prediction = knn.predict(X_new)
print("Prediction: {}".format(prediction))
print("Predicted target name: {}".format(
iris_dataset['target_names'][prediction]))
```

```
Prediction: [0]
Predicted target name: ['setosa']
```

In [35]:
```python
y_pred = knn.predict(X_test)
print("Test set predictions:\n {}".format(y_pred))
```

```
Test set predictions:
 [2 1 0 2 0 2 0 1 1 1 2 1 1 1 1 0 1 1 0 0 2 1 0 0 2 0 0 1 1 0 2 1 0 2 2 1 0
 2]
```

In [36]:
```python
print("Test set score: {:.2f}".format(np.mean(y_pred == y_test)))
```

```
Test set score: 0.97
```

In [37]:
```python
print("Test set score: {:.2f}".format(knn.score(X_test, y_test)))
```

```
Test set score: 0.97
```

In [38]:
```python
X_train, X_test, y_train, y_test = train_test_split(
iris_dataset['data'], iris_dataset['target'], random_state=0)
knn = KNeighborsClassifier(n_neighbors=1)
knn.fit(X_train, y_train)
print("Test set score: {:.2f}".format(knn.score(X_test, y_test)))
```

```
Test set score: 0.97
```

In [ ]:

In [ ]: