In [ ]:

```python
from sklearn.tree import DecisionTreeClassifier
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score,classification_report,confusion_matrix
import matplotlib.pyplot as plt
import pandas as pd
```

In [8]:

```python
data = pd.read_csv('iris.csv')
data.head()
```

Out[8]:

| | Id | SepalLengthCm | SepalWidthCm | PetalLengthCm | PetalWidthCm | Species |
|---|---|---|---|---|---|---|
| 0 | 1 | 5.1 | 3.5 | 1.4 | 0.2 | Iris-setosa |
| 1 | 2 | 4.9 | 3.0 | 1.4 | 0.2 | Iris-setosa |
| 2 | 3 | 4.7 | 3.2 | 1.3 | 0.2 | Iris-setosa |
| 3 | 4 | 4.6 | 3.1 | 1.5 | 0.2 | Iris-setosa |
| 4 | 5 | 5.0 | 3.6 | 1.4 | 0.2 | Iris-setosa |

In [9]:

```python
data.shape
```

Out[9]:

```
(150, 6)
```

In [10]:

```python
data.isnull().sum()
```

Out[10]:

```
Id                0
SepalLengthCm     0
SepalWidthCm      0
PetalLengthCm     0
PetalWidthCm      0
Species           0
dtype: int64
```

In [12]:

```python
data.Species.unique()
```

Out[12]:

```
array(['Iris-setosa', 'Iris-versicolor', 'Iris-virginica'], dtype=object)
```

In [13]:

```python
X=data.iloc[:,[0,1,2,3]]
y=data[['Species']]
```

In [14]:

```python
X.head()
```

Out[14]:

| | Id | SepalLengthCm | SepalWidthCm | PetalLengthCm |
|---|---|---|---|---|
| 0 | 1 | 5.1 | 3.5 | 1.4 |

|   | Id | SepalLengthCm | SepalWidthCm | PetalLengthCm |
|---|----|---------------|--------------|---------------|
| 0 | 1  | 5.1           | 3.5          | 1.4           |
| 1 | 2  | 4.9           | 3.0          | 1.4           |
| 2 | 3  | 4.7           | 3.2          | 1.3           |
| 3 | 4  | 4.6           | 3.1          | 1.5           |
| 4 | 5  | 5.0           | 3.6          | 1.4           |

In [15]:
```python
X_train, X_test, y_train, y_test = train_test_split(X,y, random_state = 10)
```

In [16]:
```python
X_train.shape
```

Out[16]:
```
(112, 4)
```

In [17]:
```python
y_train.shape
```

Out[17]:
```
(112, 1)
```

In [18]:
```python
model = DecisionTreeClassifier()
model.fit(X_train,y_train)
y_predict = model.predict(X_test)
accuracy_score(y_test,y_predict)
```

Out[18]:
```
1.0
```

In [19]:
```python
model.get_depth()
```

Out[19]:
```
2
```

In [20]:
```python
model = DecisionTreeClassifier(max_depth=3)
model.fit(X_train,y_train)
y_predict = model.predict(X_test)
accuracy_score(y_test,y_predict)
```

Out[20]:
```
1.0
```

In [21]:
```python
print(classification_report(y_test,y_predict))
```
```
                 precision    recall  f1-score   support

    Iris-setosa       1.00      1.00      1.00        11
Iris-versicolor       1.00      1.00      1.00        15
 Iris-virginica       1.00      1.00      1.00        12

       accuracy                           1.00        38
      macro avg       1.00      1.00      1.00        38
   weighted avg       1.00      1.00      1.00        38
```

```
In [22]:

confusion_matrix(y_test,y_predict)

Out[22]:

array([[11,  0,  0],
       [ 0, 15,  0],
       [ 0,  0, 12]])

In [23]:

from sklearn import tree
from matplotlib import rcParams
rcParams['figure.figsize']=12,12
dt = tree.DecisionTreeClassifier()
dt.fit(X,y)
tree.plot_tree(dt,
              class_names=['Setosa','Versicolor','Virginica'],
              feature_names=['sepal_length','sepal_width','petal_length','petal_width']
,
              filled=True,max_depth=6)
plt.show()
```