4.Decision Tree

```python
from sklearn.tree import DecisionTreeClassifier
import pandas as pd
from sklearn import tree
from sklearn.datasets import load_iris
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score
import matplotlib.pyplot as plt
```

```python
iris = load_iris()
iris_df = pd.DataFrame(iris.data, columns = iris.feature_names)
iris_df['species'] = iris.target
iris_df
```

Out[ ]:

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)	species
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
...	...	...	...	...	...
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

150 rows × 5 columns

```python
X = iris_df.drop(['species'], axis = 1)
y = iris_df['species']
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size = 0.2, random_s
print(X_train.shape, X_test.shape, y_train.shape, y_test.shape)
```
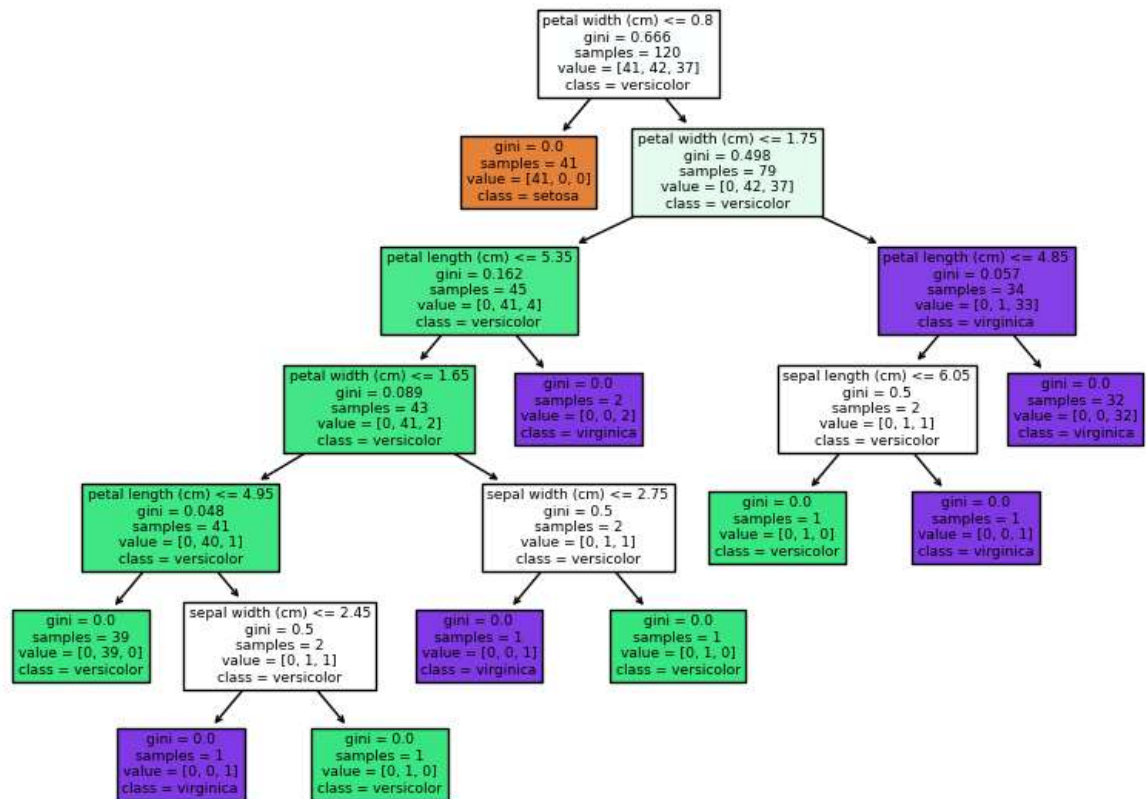
```
(120, 4) (30, 4) (120,) (30,)
```

```python
model = DecisionTreeClassifier(random_state = 13)
model.fit(X_train, y_train)
predicted = model.predict(X_test)
```

```
In [ ]:  accuracy = accuracy_score(predicted, y_test)
         print(f'Accuracy: {accuracy}')
```

Accuracy: 0.9333333333333333

```
In [ ]:  fig = plt.figure(figsize = (10, 7))
         tree.plot_tree(model, feature_names = iris.feature_names, class_names = iris.target
         plt.show()
```



```
In [ ]:
```