```python
import numpy as np
import pandas as pd
```

```python
PlayTennis=pd.read_csv('play_tennis.csv')
PlayTennis
```

	day	outlook	temp	humidity	wind	play
0	D1	Sunny	Hot	High	Weak	No
1	D2	Sunny	Hot	High	Strong	No
2	D3	Overcast	Hot	High	Weak	Yes
3	D4	Rain	Mild	High	Weak	Yes
4	D5	Rain	Cool	Normal	Weak	Yes
5	D6	Rain	Cool	Normal	Strong	No
6	D7	Overcast	Cool	Normal	Strong	Yes
7	D8	Sunny	Mild	High	Weak	No
8	D9	Sunny	Cool	Normal	Weak	Yes
9	D10	Rain	Mild	Normal	Weak	Yes
10	D11	Sunny	Mild	Normal	Strong	Yes
11	D12	Overcast	Mild	High	Strong	Yes
12	D13	Overcast	Hot	Normal	Weak	Yes
13	D14	Rain	Mild	High	Strong	No

```python
PlayTennis.dtypes
```

```
outlook     int64
temp        int64
humidity    int64
wind        int64
play        int64
dtype: object
```

```python
PlayTennis.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 14 entries, 0 to 13
Data columns (total 5 columns):
 #   Column    Non-Null Count  Dtype
---  ------    --------------  -----
 0   outlook   14 non-null     int64
 1   temp      14 non-null     int64
 2   humidity  14 non-null     int64
 3   wind      14 non-null     int64
 4   play      14 non-null     int64
dtypes: int64(5)
memory usage: 688.0 bytes
```

```python
PlayTennis.isnull().sum()
```

```
day         0
outlook     0
temp        0
humidity    0
wind        0
play        0
dtype: int64
```

```python
PlayTennis.drop(['day'],axis=1,inplace=True)
```

```python
from sklearn.preprocessing import LabelEncoder
Le = LabelEncoder()
```

```python
PlayTennis['outlook'] = Le.fit_transform(PlayTennis['outlook'])
PlayTennis['temp'] = Le.fit_transform(PlayTennis['temp'])
PlayTennis['humidity'] = Le.fit_transform(PlayTennis['humidity'])
PlayTennis['wind'] = Le.fit_transform(PlayTennis['wind'])
PlayTennis['play'] = Le.fit_transform(PlayTennis['play'])
```

```python
X = PlayTennis.drop(['play'],axis=1)
y= PlayTennis['play']
```

```
print(X)
print("-------------")
print(y)
```

```
        outlook  temp  humidity  wind
0             2     1         0     1
1             2     1         0     0
2             0     1         0     1
3             1     2         0     1
4             1     0         1     1
5             1     0         1     0
6             0     0         1     0
7             2     2         0     1
8             2     0         1     1
9             1     2         1     1
10            2     2         1     0
11            0     2         0     0
12            0     1         1     1
13            1     2         0     0
-------------
0     0
1     0
2     1
3     1
4     1
5     0
6     1
7     0
8     1
9     1
10    1
11    1
12    1
13    0
Name: play, dtype: int64
```

```
from sklearn.model_selection import train_test_split

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.65, random_state=42)

print("X_train: ", X_train.shape)
print("X_test: ", X_test.shape)
print("y_train: ", y_train.shape)
print("y_test: ", y_test.shape)
```

```
X_train:  (4, 4)
X_test:  (10, 4)
y_train:  (4,)
y_test:  (10,)
```
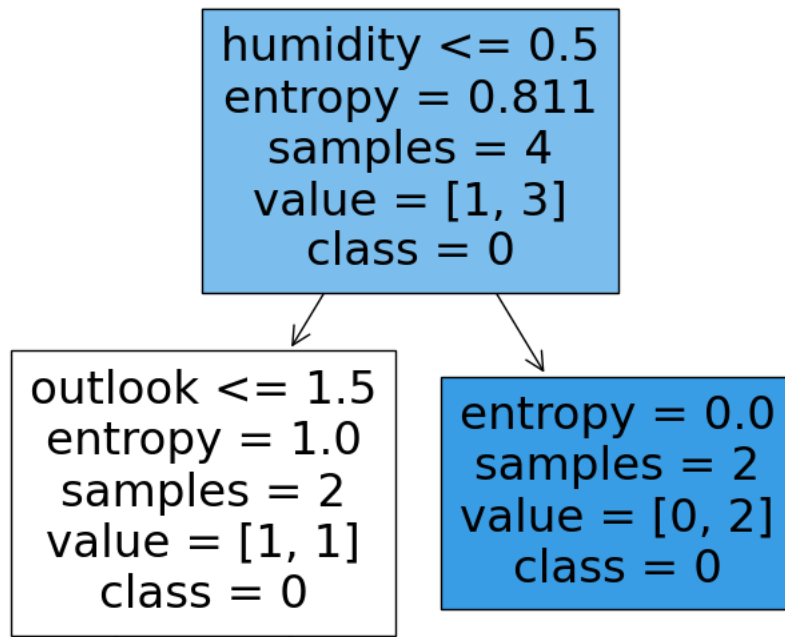
```
from sklearn import tree
dt = tree.DecisionTreeClassifier(criterion = 'entropy')
dt = dt.fit(X_train, y_train)
dt
```

```
        ▾           DecisionTreeClassifier
DecisionTreeClassifier(criterion='entropy')
```

```
dt.score(X_test,y_test)
```

```
0.8
```

```
import matplotlib.pyplot as plt
fig = plt.figure(figsize=(10,10))
a= tree.plot_tree(dt,feature_names=X.columns,class_names=y.astype(str),filled=True)
```

```
humidity <= 0.5
entropy = 0.811
samples = 4
value = [1, 3]
class = 0
```

```
outlook <= 1.5
entropy = 1.0
samples = 2
value = [1, 1]
class = 0
```

```
entropy = 0.0
samples = 2
value = [0, 2]
class = 0
```

0.8

```
entropy = 0.0
samples = 1
value = [0, 1]
class = 0
```

```
entropy = 0.0
samples = 1
value = [1, 0]
class = 0
```