```
In [2]: import pandas as pd
         df = pd.read_csv('D:\\TYCS\\501_AI\\Practical-2\\practise-jupyter\\archive\\play_tennis.csv')
 In [3]:
 Out[3]:
               day
                    outlook temp humidity
                                              wind play
           0
               D1
                      Sunny
                              Hot
                                       High
                                             Weak
                                                     No
           1
               D2
                              Hot
                                       High
                      Sunny
                                             Strong
                                                      No
           2
                                       High
               D3
                   Overcast
                              Hot
                                              Weak
                                                    Yes
           3
               D4
                       Rain
                              Mild
                                       High
                                              Weak
                                                     Yes
               D5
           4
                       Rain
                              Cool
                                     Normal
                                              Weak
                                                     Yes
           5
               D6
                       Rain
                              Cool
                                     Normal
                                             Strong
                                                      No
           6
               D7
                   Overcast
                              Cool
                                     Normal
                                             Strona
                                                     Yes
           7
               D8
                      Sunny
                              Mild
                                       High
                                              Weak
                                                      No
           8
               D9
                      Sunny
                              Cool
                                     Normal
                                              Weak
                                                    Yes
           9
              D10
                              Mild
                       Rain
                                              Weak
                                     Normal
                                                     Yes
              D11
          10
                     Sunny
                              Mild
                                     Normal
                                             Strong
                                                     Yes
              D12 Overcast
                              Mild
                                       High
                                             Strong
                                                     Yes
              D13 Overcast
                              Hot
                                     Normal
                                             Weak
                                                     Yes
          13 D14
                              Mild
                       Rain
                                       High Strong
                                                      No
 In [4]:
         df.describe()
 Out[4]:
                  day
                       outlook
                                temp
                                      humidity
                                                wind
                                                      play
           count
                   14
                            14
                                  14
                                            14
                                                   14
                                                        14
                             3
                                             2
                                                   2
                                                         2
                   14
                                   3
          unique
             top
                   D1
                         Sunny
                                 Mild
                                          High
                                               Weak
                                                       Yes
             freq
                             5
                                             7
                                                    8
 In [6]: df.shape
 Out[6]: (14, 6)
In [14]: df
              day
Out[14]:
                                  humidity
                    outlook temp
                                              wind
                                                    play
           0
               D1
                              Hot
                                       High
                                              Weak
                     Sunny
                                                     No
           1
               D2
                              Hot
                                             Strong
                      Sunnv
                                       High
                                                      No
           2
               D3
                    Overcast
                                       High
                                              Weak
                                                     Yes
           3
               Π4
                       Rain
                              Mild
                                       High
                                              Weak
                                                     Yes
           4
               D5
                       Rain
                              Cool
                                     Normal
                                              Weak
                                                     Yes
           5
               D6
                       Rain
                              Cool
                                     Normal
                                             Strona
                                                      No
           6
               D7
                   Overcast
                              Cool
                                     Normal
                                             Strong
                                                     Yes
           7
               D8
                      Sunny
                              Mild
                                       High
                                              Weak
                                                      No
           8
               D9
                      Sunny
                              Cool
                                     Normal
                                              Weak
                                                    Yes
              D10
                       Rain
                              Mild
                                     Normal
                                              Weak
                                                     Yes
          10
              D11
                      Sunny
                              Mild
                                     Normal
                                             Strong
              D12 Overcast
          11
                              Mild
                                       High
                                             Strong
                                                     Yes
          12
              D13 Overcast
                              Hot
                                     Normal
                                             Weak
                                                     Yes
              D14
                       Rain
                              Mild
                                       High Strong
                                                     No
          from sklearn.preprocessing import LabelEncoder
In [17]:
          Le = LabelEncoder()
          df['outlook'] = Le.fit transform(df['outlook'])
          df['temp'] = Le.fit_transform(df['temp'])
          df['humidity'] = Le.fit transform(df['humidity'])
```

```
df['wind'] = Le.fit transform(df['wind'])
                            df['play'] = Le.fit_transform(df['play'])
In [26]: y=df['play']
                            X=df.drop(['play','day'],axis=1)
In [28]: from sklearn import tree
                            clf = tree.DecisionTreeClassifier(criterion = 'entropy')
                            clf.fit(X,y)
                            tree.plot_tree(clf)
Text(0.333333333333333, 0.7, 'entropy = 0.0\nsamples = 4\nvalue = [0, 4]'),
                                Text(0.55555555555556, 0.7, 'X[2] \le 0.5 \cdot 1.0 
                                Text(0.666666666666666, 0.3, 'X[0] <= 1.5\nentropy = 1.0\nsamples = 2\nvalue = [1, 1]'),
                                Text(0.555555555555556, 0.1, 'entropy = 0.0\nsamples = 1\nvalue = [1, 0]'),
Text(0.77777777777778, 0.1, 'entropy = 0.0\nsamples = 1\nvalue = [0, 1]'),
Text(0.88888888888888, 0.3, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3]')]
                                                                                                 X[0] \le 0.5
                                                                                              entropy = 0.94
                                                                                               samples = 14
                                                                                               value = [5, 9]
                                                                                                                      X[2] \le 0.5
                                                                          entropy = 0.0
                                                                                                                     entropy = 1.0
                                                                           samples = 4
                                                                                                                    samples = 10
                                                                          value = [0, 4]
                                                                                                                    value = [5, 5]
                                                                           X[0] <= 1.5
                                                                                                                                                                 X[3] \le 0.5
                                                                       entropy = 0.722
                                                                                                                                                             entropy = 0.722
                                                                          samples = 5
                                                                                                                                                                samples = 5
                                                                         value = [4, 1]
                                                                                                                                                               value = [1, 4]
                                                      X[3] \le 0.5
                                                                                                                                            X[0] <= 1.5
                                                                                               entropy = 0.0
                                                                                                                                                                                     entropy = 0.0
                                                     entropy = 1.0
                                                                                                                                          entropy = 1.0
                                                                                                samples = 3
                                                                                                                                                                                      samples = 3
                                                     samples = 2
                                                                                                                                           samples = 2
                                                                                               value = [3, 0]
                                                                                                                                                                                     value = [0, 3]
                                                    value = [1, 1]
                                                                                                                                          value = [1, 1]
                               entropy = 0.0
                                                                          entropy = 0.0
                                                                                                                     entropy = 0.0
                                                                                                                                                                entropy = 0.0
                                samples = 1
                                                                           samples = 1
                                                                                                                      samples = 1
                                                                                                                                                                 samples = 1
                               value = [1, 0]
                                                                          value = [0, 1]
                                                                                                                     value = [1, 0]
                                                                                                                                                                value = [0, 1]
   In [ ]:
```

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In []: