

## 03\_Decision\_tree\_classifier

### ▼ Step-1 Import Data

```
import pandas as pd
df = pd.read_csv("mldata1.csv")
df.head()
```

	age	height	weight	gender	likeness
0	27	170.688	76.0	Male	Biryani
1	41	165	70.0	Male	Biryani
2	29	171	80.0	Male	Biryani
3	27	173	102.0	Male	Biryani
4	29	164	67.0	Male	Biryani

### ▼ Step-2 Making input and Output Variable

```
df["gender"] = df["gender"].replace("Male",1)
df["gender"] = df["gender"].replace("Female",0)
```

```
# selection of input and output variable
X = df[["weight", "gender"]]
y = df["likeness"]
```

### ▼ Step-3 Making Machine Learning Model

```
# Machine learning algorithm
from sklearn.tree import DecisionTreeClassifier
# Create and fit our model
model = DecisionTreeClassifier().fit(X,y)
# predict the result
model.predict([[43,0]])
```

```
/usr/local/lib/python3.10/dist-packages/sklearn/base.py:439: UserWarning: X does not have valid feature names, but DecisionTreeClassifier
warnings.warn(
array(['Samosa'], dtype=object))
```

### ▼ Step-4 Checking machine learning model performance

```
# How to measure the accuracy of model
# Split data into test and train(80/20)
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score
X_train, X_test, y_train, y_test = train_test_split(X,y,test_size=0.2)
#Create a model
model = DecisionTreeClassifier().fit(X_train,y_train)
predicted_values = model.predict(X_test)
predicted_values
```

```
array(['Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani',
      'Pakora', 'Biryani', 'Samosa', 'Biryani', 'Biryani', 'Biryani',
      'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani',
      'Biryani', 'Biryani', 'Biryani', 'Samosa', 'Biryani', 'Biryani',
      'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani',
      'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Samosa', 'Biryani',
      'Biryani', 'Biryani', 'Biryani', 'Samosa', 'Biryani', 'Biryani',
```

```
'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Samosa',
'Biryani'], dtype=object)
```

```
# checking the score
score = accuracy_score(y_test, predicted_values)
score
```

```
0.6326530612244898
```

## ▼ Step-5 Making Visualization

```
# Install required libraries
!pip install scikit-learn
!apt-get install graphviz
!pip install pydotplus

# Import libraries
from sklearn.tree import DecisionTreeClassifier
from sklearn.datasets import load_iris
from sklearn import tree
import pydotplus
from IPython.display import Image

# Load the dataset
iris = load_iris()
X = iris.data
y = iris.target

# Fit the model
model = DecisionTreeClassifier()
model.fit(X, y)

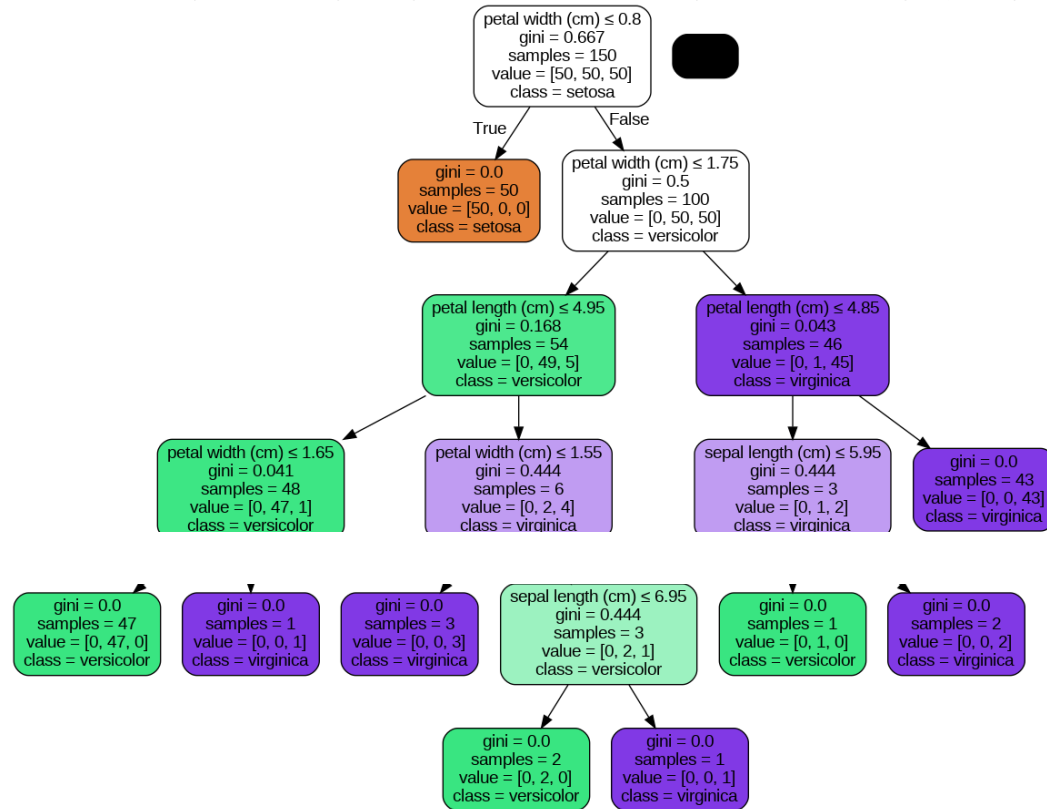
# Generate the visualization
dot_data = tree.export_graphviz(
    model, out_file=None,
    feature_names=iris.feature_names,
    class_names=iris.target_names,
    filled=True, rounded=True,
    special_characters=True
)

graph = pydotplus.graph_from_dot_data(dot_data)
graph.write_png("foodie.png")

# Display the tree
Image(graph.create_png())
```

☞

Looking in indexes: <https://pypi.org/simple>, <https://us-python.pkg.dev/colab-wheels/public/simple/>  
 Requirement already satisfied: scikit-learn in /usr/local/lib/python3.10/dist-packages (1.2.2)  
 Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python3.10/dist-packages (from scikit-learn) (1.24.0)  
 Requirement already satisfied: scipy>=1.3.2 in /usr/local/lib/python3.10/dist-packages (from scikit-learn) (1.10.1)  
 Requirement already satisfied: joblib>=1.1.1 in /usr/local/lib/python3.10/dist-packages (from scikit-learn) (1.2.0)  
 Requirement already satisfied: threadpoolctl>=2.0.0 in /usr/local/lib/python3.10/dist-packages (from scikit-learn) (3.1.0)  
 Reading package lists... Done  
 Building dependency tree  
 Reading state information... Done  
 graphviz is already the newest version (2.42.2-3build2).  
 0 upgraded, 0 newly installed, 0 to remove and 38 not upgraded.  
 Looking in indexes: <https://pypi.org/simple>, <https://us-python.pkg.dev/colab-wheels/public/simple/>  
 Requirement already satisfied: pydotplus in /usr/local/lib/python3.10/dist-packages (2.0.2)  
 Requirement already satisfied: pyparsing>=2.0.1 in /usr/local/lib/python3.10/dist-packages (from pydotplus) (3.1.0)



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