CODES:

# Importing necessary libraries

import pandas as pd

import numpy as np

import matplotlib.pyplot as plt

from sklearn.model\_selection import train\_test\_split

from sklearn.tree import DecisionTreeClassifier

from sklearn.metrics import accuracy\_score, precision\_score, recall\_score, f1\_score

# Load the Brain Tumor dataset

file\_path = 'path/to/your/Brain Tumor (1).csv'

dataset = pd.read\_csv(file\_path)

# Display dataset shape and head

print("Dataset shape:", dataset.shape)

print("First few rows of the dataset:")

print(dataset.head())

# Data preprocessing (handle missing values, outliers, etc.)

# For simplicity, we assume the dataset does not have missing values or outliers

# Splitting the dataset into features (X) and target variable (y)

X = dataset.drop(columns=["Class"])

y = dataset["Class"]

# Splitting the dataset into training and testing sets (80% training, 20% testing)

X\_train, X\_test, y\_train, y\_test = train\_test\_split(X, y, test\_size=0.2, random\_state=42)

# Initialize and train the Decision Tree classifier

dt\_classifier = DecisionTreeClassifier(random\_state=42)

dt\_classifier.fit(X\_train, y\_train)

# Making predictions on the testing set

y\_pred = dt\_classifier.predict(X\_test)

# Evaluation metrics

accuracy = accuracy\_score(y\_test, y\_pred)

precision = precision\_score(y\_test, y\_pred, average='macro')

recall = recall\_score(y\_test, y\_pred, average='macro')

f1 = f1\_score(y\_test, y\_pred, average='macro')

# Print evaluation metrics

print("Decision Tree Classifier Performance:")

print("Accuracy:", accuracy)

print("Precision:", precision)

print("Recall:", recall)

print("F1-Score:", f1)

# Optional: Plot the Decision Tree (requires Graphviz installed)

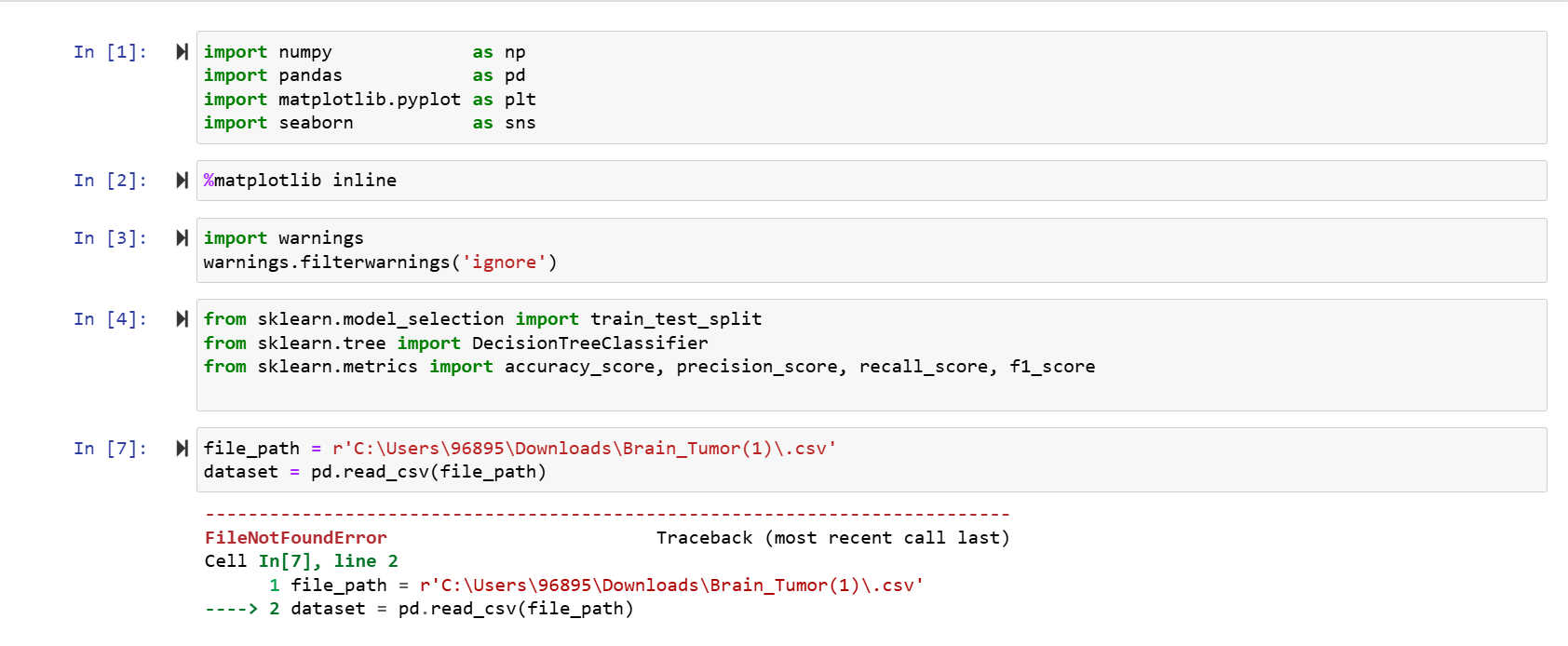
from sklearn.tree import plot\_tree

plt.figure(figsize=(20,10))

plot\_tree(dt\_classifier, filled=True, feature\_names=X.columns, class\_names=['No Tumor', 'Tumor'])

plt.show()

****

****

Brain tumor. (n.d.). Kaggle: Your Machine Learning and Data Science Community. <https://www.kaggle.com/datasets/jakeshbohaju/brain-tumor>