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import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier
from sklearn.metrics import accuracy_score
import matplotlib.pyplot as plt
from sklearn.tree import plot_tree

data = pd.read_csv("C:/Users/sheetal/Downloads/bank.csv")

print("Null values in the dataset:\n", data.isnull().sum())

target_column = 'marital'
features = data.drop(target_column, axis=1)
target = data[target_column]

features = pd.get_dummies(features, drop_first=True)

X_train, X_test, y_train, y_test = train_test_split(features, target,
test_size=0.3, random_state=42)

classifier = DecisionTreeClassifier(random_state=42, max_depth=5,
min_samples_split=10)

classifier.fit(X_train, y_train)

y_pred = classifier.predict(X_test)

accuracy = accuracy_score(y_test, y_pred)
print(f"Accuracy: {accuracy * 100:.2f}%")

plt.figure(figsize=(20, 10))
plot_tree(classifier, feature_names=features.columns,
class_names=target.unique(), filled=True, fontsize=10)
plt.title(f"Decision Tree Visualization (Target: {target_column})")
plt.show()

```

Null values in the dataset:

age	0
job	0
marital	0
education	0
default	0
balance	0
housing	0
loan	0
contact	0
day	0
month	0
duration	0
campaign	0

pdays 0  
previous 0  
poutcome 0  
deposit 0  
dtype: int64  
Accuracy: 67.45%

Decision Tree Visualization (Target: marital)

