

# task 3

```
import pandas as pd

from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier, plot_tree
from sklearn.metrics import classification_report, accuracy_score
from sklearn.preprocessing import LabelEncoder

import matplotlib.pyplot as plt
```

# Step 1: Load dataset

```
df = pd.read_csv("BANK1.csv", delimiter=';')
```

# Step 2: Encode categorical variables

```
label_encoders = {}

for column in df.select_dtypes(include='object').columns:

    le = LabelEncoder()

    df[column] = le.fit_transform(df[column])

    label_encoders[column] = le
```

# Step 3: Split features and target

```
print("Columns in dataset:", df.columns)

X = df.drop("y", axis=1) # 'y' is the target column
y = df["y"]
```

# Step 4: Train/test split

```
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
```

# Step 5: Train Decision Tree Classifier

```
clf = DecisionTreeClassifier(random_state=42)

clf.fit(X_train, y_train)
```

```
# Step 6: Predict and evaluate
```

```
y_pred = clf.predict(X_test)
```

```
print("Accuracy:", accuracy_score(y_test, y_pred))
```

```
print("Classification Report:\n", classification_report(y_test, y_pred))
```

```
# Step 7: Visualize decision tree
```

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

```
plot_tree(clf, feature_names=X.columns, class_names=['No', 'Yes'], filled=True)
```

```
plt.title("Decision Tree Visualization")
```

```
plt.show()
```