```
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

df=pd.read_csv("/task3.csv")
```

```
df.head()
```

	age	job	marital	education	default	balance	housing	loan	contact	day	mor
0	59	admin.	married	secondary	no	2343	yes	no	unknown	5	m
1	56	admin.	married	secondary	no	45	no	no	unknown	5	m
2	41	technician	married	secondary	no	1270	yes	no	unknown	5	m
3	55	services	married	secondary	no	2476	yes	no	unknown	5	m
4	54	admin.	married	tertiary	no	184	no	no	unknown	5	m

Next steps: View recommended plots

```
df.tail()
```

	age	job	marital	education	default	balance	housing	loan	contact	day
11157	33	blue-collar	single	primary	no	1	yes	no	cellular	20
11158	39	services	married	secondary	no	733	no	no	unknown	16
11159	32	technician	single	secondary	no	29	no	no	cellular	19
11160	43	technician	married	secondary	no	0	no	yes	cellular	8
11161	34	technician	married	secondary	no	0	no	no	cellular	9

```
df.shape
```

```
(11162, 17)
```

```
df.columns
```

```
Index(['age', 'job', 'marital', 'education', 'default', 'balance', 'housing',
       'loan', 'contact', 'day', 'month', 'duration', 'campaign', 'pdays',
       'previous', 'poutcome', 'deposit'],
      dtype='object')
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 11162 entries, 0 to 11161
Data columns (total 17 columns):
 #   Column     Non-Null Count  Dtype
---  ------     --------------  -----
 0   age        11162 non-null  int64
 1   job        11162 non-null  object
 2   marital    11162 non-null  object
 3   education  11162 non-null  object
 4   default    11162 non-null  object
 5   balance    11162 non-null  int64
 6   housing    11162 non-null  object
 7   loan       11162 non-null  object
 8   contact    11162 non-null  object
 9   day        11162 non-null  int64
 10  month      11162 non-null  object
 11  duration   11162 non-null  int64
 12  campaign   11162 non-null  int64
```

```
 13  pdays      11162 non-null  int64
 14  previous   11162 non-null  int64
 15  poutcome   11162 non-null  object
 16  deposit    11162 non-null  object
dtypes: int64(7), object(10)
memory usage: 1.4+ MB
```

```
df.describe()
```

	age	balance	day	duration	campaign	pdays
count	11162.000000	11162.000000	11162.000000	11162.000000	11162.000000	11162.000000
mean	41.231948	1528.538524	15.658036	371.993818	2.508421	51.330407
std	11.913369	3225.413326	8.420740	347.128386	2.722077	108.758282
min	18.000000	-6847.000000	1.000000	2.000000	1.000000	-1.000000
25%	32.000000	122.000000	8.000000	138.000000	1.000000	-1.000000
50%	39.000000	550.000000	15.000000	255.000000	2.000000	-1.000000
75%	49.000000	1708.000000	22.000000	496.000000	3.000000	20.750000
max	95.000000	81204.000000	31.000000	3881.000000	63.000000	854.000000

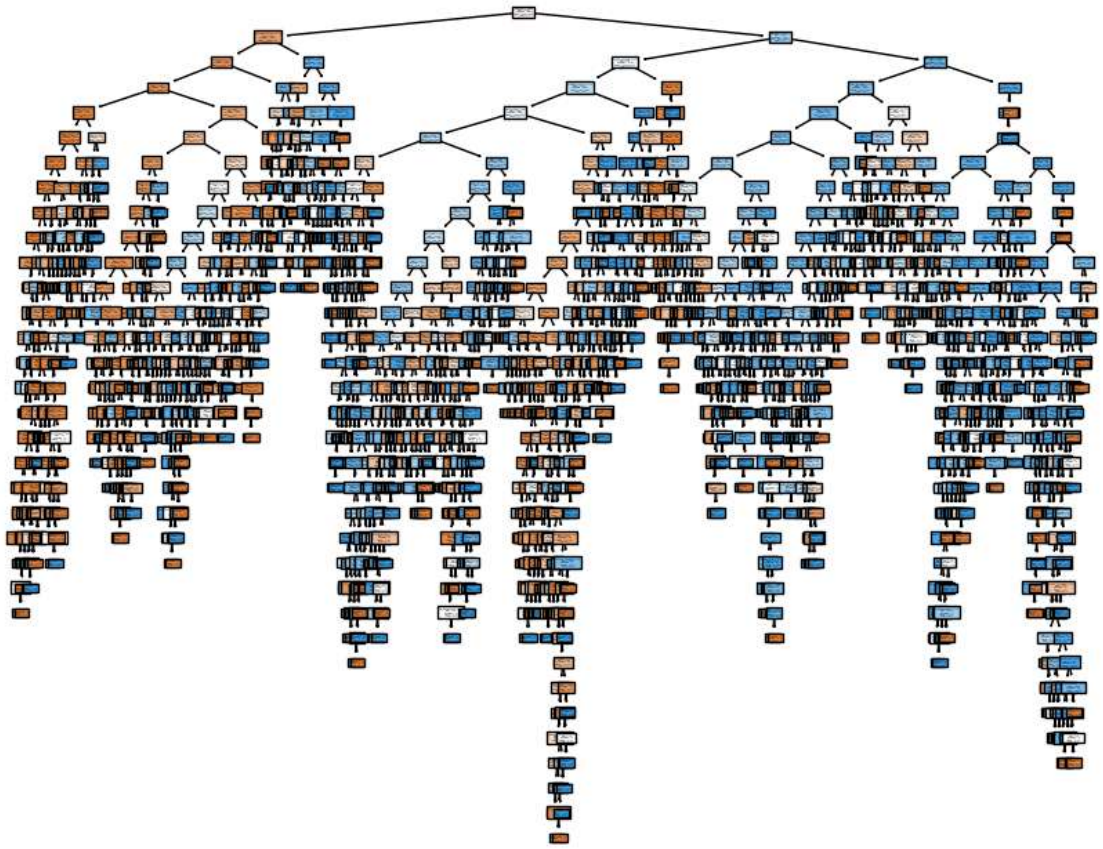
```
df.isnull().sum()
```

```
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
```

```
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier, plot_tree
from sklearn.metrics import accuracy_score
X = df.drop('deposit', axis=1)
y = df['deposit']
X = pd.get_dummies(X)
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
clf = DecisionTreeClassifier()
clf.fit(X_train, y_train)
y_pred = clf.predict(X_test)
accuracy = accuracy_score(y_test, y_pred)
print("Accuracy:", accuracy)
```

```
Accuracy: 0.780564263322884
```

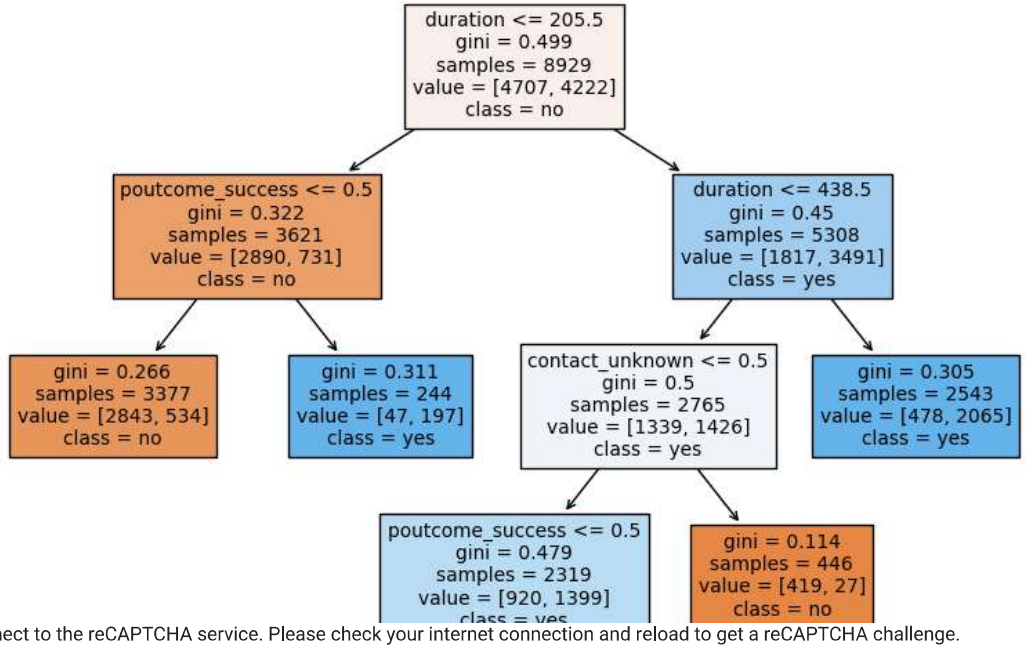
```
plt.figure(figsize=(10, 8))
plot_tree(clf, feature_names=X.columns, class_names=['no', 'yes'], filled=True)
plt.show()
```



```
clf = DecisionTreeClassifier(ccp_alpha=0.01)
clf.fit(X_train, y_train)
y_pred = clf.predict(X_test)
accuracy = accuracy_score(y_test, y_pred)
print("Accuracy:", accuracy)
```

```
Accuracy: 0.7604120017913122
```

```
plt.figure(figsize=(10, 8))
plot_tree(clf, feature_names=X.columns, class_names=['no', 'yes'], filled=True)
plt.show()
```



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