

Predict if a customer subscribes to a term deposit or not, when contacted by a marketing agent, by understanding the different features and performing predictive analytics using bank-additional-full.csv dataset

The image shows a VS Code editor window with a Jupyter Notebook open. The notebook contains the following code and output:

```
df=pd.read_csv(r'D:\I\vedant\Vscode\Bank.csv')
```

[789] ✓ 0.1s Python

```
df.head()
```

[790] ✓ 0.0s Python

	age	job	marital	education	default	housing	loan	contact	month	day_of_week	...	campaign	pdays	previous	poutcome	emp
0	56	housemaid	married	basic.4y	no	no	no	telephone	may	mon	...	1	999	0	nonexistent	
1	57	services	married	high.school	unknown	no	no	telephone	may	mon	...	1	999	0	nonexistent	
2	37	services	married	high.school	no	yes	no	telephone	may	mon	...	1	999	0	nonexistent	
3	40	admin.	married	basic.6y	no	no	no	telephone	may	mon	...	1	999	0	nonexistent	
4	56	services	married	high.school	no	no	yes	telephone	may	mon	...	1	999	0	nonexistent	

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The second screenshot shows the same notebook with the following code and output:

```
df.info()
```

[791] ✓ 0.0s Python

```
<class 'pandas.core.frame.DataFrame'>  
RangeIndex: 41188 entries, 0 to 41187  
Data columns (total 21 columns):  
#   Column                Non-Null Count  Dtype  
---  ---  
0   age                   41188 non-null  int64  
1   job                   41188 non-null  object  
2   marital               41188 non-null  object  
3   education             41188 non-null  object  
4   default               41188 non-null  object  
5   housing               41188 non-null  object  
6   loan                  41188 non-null  object  
7   contact               41188 non-null  object  
8   month                 41188 non-null  object  
9   day_of_week           41188 non-null  object  
10  duration              41188 non-null  int64  
11  campaign              41188 non-null  int64  
12  pdays                 41188 non-null  int64  
13  previous              41188 non-null  int64  
14  poutcome              41188 non-null  object  
15  emp.var.rate          41188 non-null  float64  
16  cons.price.idx         41188 non-null  float64  
17  cons.conf.idx          41188 non-null  float64  
18  euribor3m             41188 non-null  float64  
19  nr.employed            41188 non-null  float64  
20  y                      41188 non-null  object
```

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EXPLORER ... webscapping.ipynb prime.py testPython.ipynb Assign.ipynb Assignment.ipynb Assignment.ipynb C:\...\Rar\$Dla16456.16247

PYTHON stomer subscribes to a term deposit or not, when contacted by a marketing agent, by understanding the different features and performing... > from sklearn.model_selection import train_test_split

Assign.ipynb

Assignment.ipynb

FileHandling.ipynb

flow control.ipynb

Functions.ipynb

Ice-cream.ipynb

Introduction.ipynb

loops.ipynb

oops.ipynb

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webscapping.ipynb

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

```
age      0
job      0
marital  0
education 0
default  0
housing  0
loan     0
contact  0
month    0
day_of_week 0
duration 0
campaign 0
pdays   0
previous 0
poutcome 0
emp.var.rate 0
cons.price.idx 0
cons.conf.idx 0
euribor3m  0
nr.employed 0
y          0
dtype: int64
```

```
df.duplicated().sum()
```

```
12
```

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```
df.duplicated().sum()
```

```
12
```

```
df.drop_duplicates(inplace=True)
```

```
df.duplicated().sum()
```

```
0
```

```
df.size
```

```
864696
```

```
df.shape
```

```
(41176, 21)
```

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df.head(2)

0.0s

	age	job	marital	education	default	housing	loan	contact	month	day_of_week	...	campaign	pdays	previous	poutcome	emp
0	56	housemaid	married	basic.4y	no	no	no	telephone	may	mon	...	1	999	0	nonexistent	
1	57	services	married	high.school	unknown	no	no	telephone	may	mon	...	1	999	0	nonexistent	

2 rows x 21 columns

num_col=df.select_dtypes('int64','float64')

cat_col=df.select_dtypes('object')

0.0s

from sklearn.preprocessing import MinMaxScaler

0.0s

mn=MinMaxScaler()

0.0s

for col in num_col:

df[col]=mn.fit_transform(df[[col]])

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for col in num_col:

df[col]=mn.fit_transform(df[[col]])

0.0s

df.head(2)

0.0s

	age	job	marital	education	default	housing	loan	contact	month	day_of_week	...	campaign	pdays	previous	poutcome	emp
0	0.481481	housemaid	married	basic.4y	no	no	no	telephone	may	mon	...	0.0	1.0	0.0	nonexistent	
1	0.493827	services	married	high.school	unknown	no	no	telephone	may	mon	...	0.0	1.0	0.0	nonexistent	

2 rows x 21 columns

from sklearn.preprocessing import LabelEncoder

0.0s

le=LabelEncoder()

0.0s

for col in cat_col:

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PYTHON stomer subscribes to a term deposit or not, when contacted by a marketing agent, by understanding the different features and performing... > from sklearn.model_selection import train_test_split Python 3.12.1

```
for col in cat_col:
    df[col]=le.fit_transform(df[[col]])
```

[806] ✓ 0.0s Python

```
df.head(2)
```

[807] ✓ 0.0s Python

	age	job	marital	education	default	housing	loan	contact	month	day_of_week	...	campaign	pdays	previous	poutcome	emp.var.rate
0	0.481481	3	1	0	0	0	0	1	6	1	...	0.0	1.0	0.0	1	1.
1	0.493827	7	1	3	1	0	0	1	6	1	...	0.0	1.0	0.0	1	1.

2 rows × 21 columns

```
x=df.drop('y',axis=1)
y=df['y']
```

[808] ✓ 0.0s Python

```
from sklearn.model_selection import train_test_split
```

[809] ✓ 0.0s Python

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PYTHON stomer subscribes to a term deposit or not, when contacted by a marketing agent, by understanding the different features and performing... > from sklearn.model_selection import train_test_split Python 3.12.1

```
from sklearn.model_selection import train_test_split
```

[809] ✓ 0.0s Python

```
x_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.20, random_state=42)
```

[810] ✓ 0.0s Python

```
x_test.shape
```

[811] ✓ 0.0s Python

... (8236, 20)

```
y_test.shape
```

[812] ✓ 0.0s Python

... (8236,)

```
x_train.shape
```

[813] ✓ 0.0s Python

... (32948, 20)

```
y_train.shape
```

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stomer subscribes to a term deposit or not, when contacted by a marketing agent, by understanding the different features and performing... > from sklearn.model_selection import train_test_split

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```
[814] y_train.shape
      0.0s
... (32940,)
```

```
[815] from sklearn.svm import SVC
      0.0s
```

```
[816] svm=SVC()
      0.0s
```

```
[817] svm.fit(x_train,y_train)
      10.4s
```

```
[818] y_pred_svm=svm.predict(x_test)
      6.6s
```

OUTLINE

TIMELINE

3 27 0

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M Predict if a customer subscribes to a term deposit or not, when contacted by a marketing agent, by understanding the different features and performing... > y_pred_svm=svm.predict(x_test)

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```
[816] svm=SVC()
      0.0s
```

```
[817] svm.fit(x_train,y_train)
      10.4s
```

```
[818] y_pred_svm=svm.predict(x_test)
      6.6s
```

```
[819] svm.score(x_train,y_train)
      27.8s
... 0.8886460230722526
```

```
[820] svm.score(x_test,y_test)
      5.6s
... 0.8821029626032054
```

OUTLINE

TIMELINE

3 27 0

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Python 3.12.1

```
svm.score(x_test,y_test)
```

[820] ✓ 5.6s Python

0.8821029626032054

```
from sklearn.metrics import classification_report
```

[821] ✓ 0.0s Python

```
print(classification_report(y_test,y_pred_svm))
```

[822] ✓ 0.0s Python

	precision	recall	f1-score	support
0	0.88	1.00	0.94	7265
1	0.00	0.00	0.00	971
accuracy			0.88	8236
macro avg	0.44	0.50	0.47	8236
weighted avg	0.78	0.88	0.83	8236

Ln 1, Col 24 Spaces: 4 Spaces: 4 CRLF Cell 118 of 123 Go Live Python

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