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OUTLINE

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```
1 import pandas as pd
```

PROBLEMS OUTPUT TERMINAL PORTS

PS E:\lab> e:: cd 'e:\lab'; & 'C:\Users\Lenovo\AppData\Local\Microsoft\WindowsApps\python3.11.exe' 'c:\Users\Lenovo\.vscode\extensions\ms-python.python-2023.22.1\pythonFiles\lib\python\debugpy\adapter\..\..\debugpy\launcher' '63922' '-...' 'e:\lab\project\Machine_learning\codsoft_task 3\Customers_churn_prediction.py'

RowNumber	CustomerId	Surname	Creditscore	HasCrCard	IsActiveMember	EstimatedSalary	Exited
0	1	15634602	Hargrave	619	...	1	101348.88
1	2	15647311	Hill	608	...	0	112542.58
2	3	15619304	Onio	502	...	1	113931.57
3	4	15701354	Boni	699	...	0	93826.63
4	5	15737888	Mitchell	850	...	1	79084.10
...
9995	9996	15606229	Obijaku	771	...	0	96270.64
9996	9997	15569892	Johnstone	516	...	1	101699.77
9997	9998	15584532	Liu	709	...	0	42085.58
9998	9999	15682355	Sabbatini	772	...	1	92888.52
9999	10000	15628319	Walker	792	...	1	38190.78

[10000 rows x 14 columns]

RowNumber	CustomerId	Surname	Creditscore	HasCrCard	IsActiveMember	EstimatedSalary	Exited
0	1	15634602	Hargrave	619	...	1	101348.88
1	2	15647311	Hill	608	...	0	112542.58
2	3	15619304	Onio	502	...	1	113931.57
3	4	15701354	Boni	699	...	0	93826.63
4	5	15737888	Mitchell	850	...	1	79084.10

[5 rows x 14 columns]

```
<class 'pandas.core.frame.DataFrame'>
```

RangeIndex: 10000 entries, 0 to 9999

Data columns (total 14 columns):

#	Column	Non-Null Count	Dtype
0	RowNumber	10000 non-null	int64
1	CustomerId	10000 non-null	int64
2	Surname	10000 non-null	object
3	Creditscore	10000 non-null	int64
4	Geography	10000 non-null	object
5	Gender	10000 non-null	object
6	Age	10000 non-null	int64
7	Tenure	10000 non-null	int64

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6 Age 10000 non-null int64

7 Tenure 10000 non-null int64

8 Balance 10000 non-null float64

9 NumOfProducts 10000 non-null int64

10 HasCrCard 10000 non-null int64

11 IsActiveMember 10000 non-null int64

12 EstimatedSalary 10000 non-null float64

13 Exited 10000 non-null int64

dtypes: float64(2), int64(9), object(3)

memory usage: 1.14 MB

None	RowNumber	CustomerId	Surname	Creditscore	Geography	Gender	Age	Tenure	Balance	NumOfProducts	HasCrCard	IsActiveMember	EstimatedSalary	Exited
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
...
9995	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9996	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9997	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9998	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9999	0	0	0	0	0	0	0	0	0	0	0	0	0	0

dtype: int64

Index(['RowNumber', 'CustomerId', 'Surname', 'Creditscore', 'Geography', 'Gender', 'Age', 'Tenure', 'Balance', 'NumOfProducts', 'HasCrCard', 'IsActiveMember', 'EstimatedSalary', 'Exited'], dtype='object')

Creditscore	Geography	Gender	Age	Tenure	...	NumOfProducts	HasCrCard	IsActiveMember	EstimatedSalary	Exited
619	France	Female	42	2	...	1	1	1	101348.88	1
608	Spain	Female	41	1	...	1	0	1	112542.58	0
502	France	Female	42	8	...	3	1	0	113931.57	1
699	France	Female	39	1	...	2	0	0	93826.63	0
850	Spain	Female	43	2	...	1	1	1	79084.10	0
...
771	France	Male	39	5	...	2	1	0	96270.64	0
516	France	Male	35	10	...	1	1	1	101699.77	0

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1 import pandas as pd
```

PROBLEMS OUTPUT TERMINAL PORTS

```
0 2962
1 2037
Name: count, dtype: int64
Training shape: (9000, 11)
Testing Shape:
CreditScore Age Tenure Balance ... EstimatedSalary Geography_Germany Geography_Spain Gender_Mal
e
6252 596 32 3 96709 ... 41788 1 0 1
4684 623 43 1 0 ... 146379 0 0 1
1731 601 44 4 0 ... 58561 0 1 0
4521 560 27 7 124995 ... 114669 0 1 0
... ..
3921 567 59 3 0 ... 25843 0 0 1
6685 636 34 8 0 ... 38570 0 0 1
3194 690 26 3 118097 ... 61257 0 0 0
1941 452 44 3 88915 ... 69697 0 1 1
7713 793 56 8 119496 ... 29880 0 0 1

[1000 rows x 11 columns]
[[-0.47944328 0.19687202 -0.00234647 ... -0.5761528 -0.57700814
 0.91105005]
 [ 1.04588863 1.33803657 1.03625698 ... -0.5761528 -0.57700814
 -1.09763453]
 [-0.85297437 -0.08841912 1.03625698 ... -0.5761528 1.73307782
 0.91105005]
 ...
 [ 0.86941896 -0.08841912 -1.38715108 ... -0.5761528 -0.57700814
 -1.09763453]
 [ 0.16386025 0.38706611 1.03625698 ... -0.5761528 -0.57700814
 0.91105005]
 [ 0.47513615 1.14784248 -1.38715108 ... 1.73565068 -0.57700814
 0.91105005]]
Model Accuracy: 0.809
Model Accuracy: 0.865
Model Accuracy: 0.866
Model Accuracy: 0.798
Model Accuracy: 0.84
Model Accuracy: 0.867
Model ACC
0 LR 0.809
1 svm 0.865
2 KNN 0.866
3 dt 0.798
4 rf 0.840
5 GBC 0.867
```

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4521 560 27 7 124995 ... 114669 0 1 0
... ..
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7713 793 56 8 119496 ... 29880 0 0 1

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 ...
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