

Assignment -2
Python Programming

Assignment Date	27 September 2022
Student Name	Ravindran E
Student Roll Number	412519104108
Maximum Marks	2 Marks

Question-1:

Download dataset

Solution:

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.preprocessing import LabelEncoder
from sklearn.model_selection import train_test_split
df=pd.read_csv('/Churn_Modelling.csv')
df.head()
```

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.preprocessing import LabelEncoder
from sklearn.model_selection import train_test_split

df=pd.read_csv('/Churn_Modelling.csv')
```

Question 2:

Dataset details

Solution:

```
df.head()
df.describe()
df.info()
```

```
[ ] df=pd.read_csv('/Churn_Modelling.csv')
```

Dataset Summary

```
[ ] df.head()
```

	RowNumber	CustomerId	Surname	CreditScore	Geography	Gender	Age	Tenure	Balance	NumOfProducts	HasCrCard	IsActiveMember	EstimatedSalary	Exited
0	1	15634602	Hargrave	619	France	Female	42	2	0.00	1	1	1	101348.88	1
1	2	15647311	Hill	608	Spain	Female	41	1	83807.86	1	0	1	112542.58	0
2	3	15619304	Onio	502	France	Female	42	8	159660.80	3	1	0	113931.57	1
3	4	15701354	Boni	699	France	Female	39	1	0.00	2	0	0	93826.63	0
4	5	15737888	Mitchell	850	Spain	Female	43	2	125510.82	1	1	1	79084.10	0

```
[ ] df.describe()
```

	RowNumber	CustomerId	CreditScore	Age	Tenure	Balance	NumOfProducts	HasCrCard	IsActiveMember	EstimatedSalary	Exited
count	10000.00000	1.000000e+04	10000.000000	10000.000000	10000.000000	10000.000000	10000.000000	10000.00000	10000.000000	10000.000000	10000.000000
mean	5000.50000	1.569094e+07	650.528800	38.921800	5.012800	76485.889288	1.530200	0.70550	0.515100	100090.239881	0.203700
std	2886.89568	7.193619e+04	96.653299	10.487806	2.892174	62397.405202	0.581654	0.45584	0.499797	57510.492818	0.402769
min	1.00000	1.556570e+07	350.000000	18.000000	0.000000	0.000000	1.000000	0.00000	0.000000	11.580000	0.000000

```
[ ] df.info()
```

```
<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
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: 1.1+ MB
```

Question 3:

Plot of dataset details and etc

Solution:

```
sns.distplot(df.Age)
```

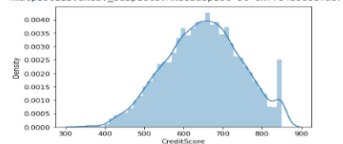
```
sns.distplot(df.CreditScore)
```

```
[ ] df.head(2)
```

RowNumber	CustomerId	Surname	Creditscore	Geography	Gender	Age	Tenure	Balance	NumOfProducts	HasCrCard	IsActiveMember	EstimatedSalary	Exited
0	1	15634602	Hargrave	France	Female	42	2	0.00	1	1	1	101348.88	1
1	2	15647311	Hill	Spain	Female	41	1	63807.86	1	0	1	112542.58	0

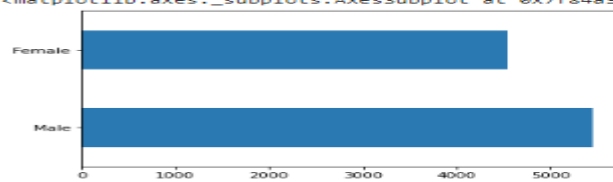
```
[ ] sns.distplot(df.Creditscore)
```

/usr/local/lib/python3.7/dist-packages/seaborn/distributions.py:2619: FutureWarning: 'distplot' is a deprecated function and will be removed in a future version. Please adapt your code to use either warnings.warn(msg, FutureWarning)



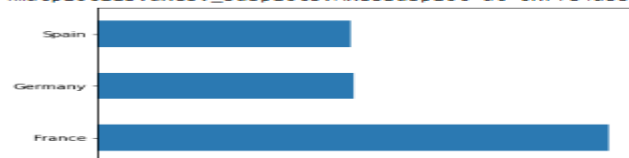
```
[ ] df.Gender.value_counts().plot(kind='barh')
```

<matplotlib.axes._subplots.AxesSubplot at 0x7f84a33fd210>



```
[ ] df.Geography.value_counts().plot(kind='barh')
```

<matplotlib.axes._subplots.AxesSubplot at 0x7f84a338e4d0>

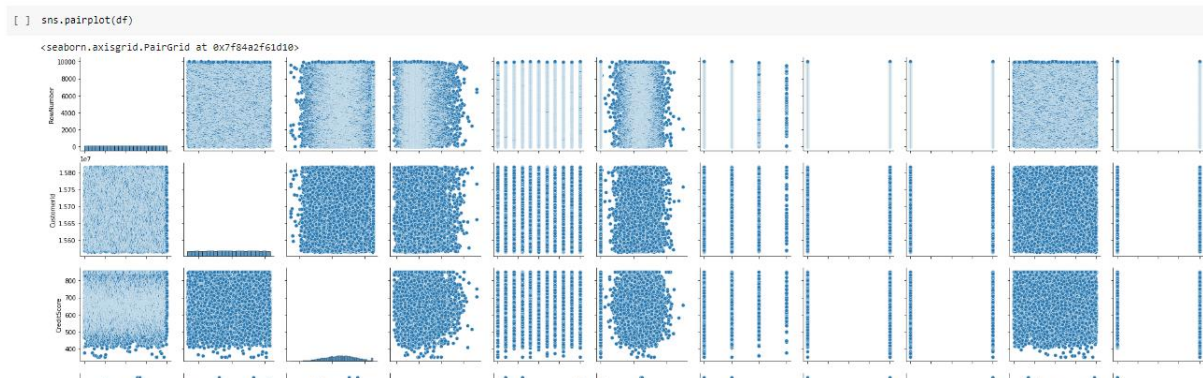


Question 5:

dataset pairplot

Solution:

sns.pairplot(df)



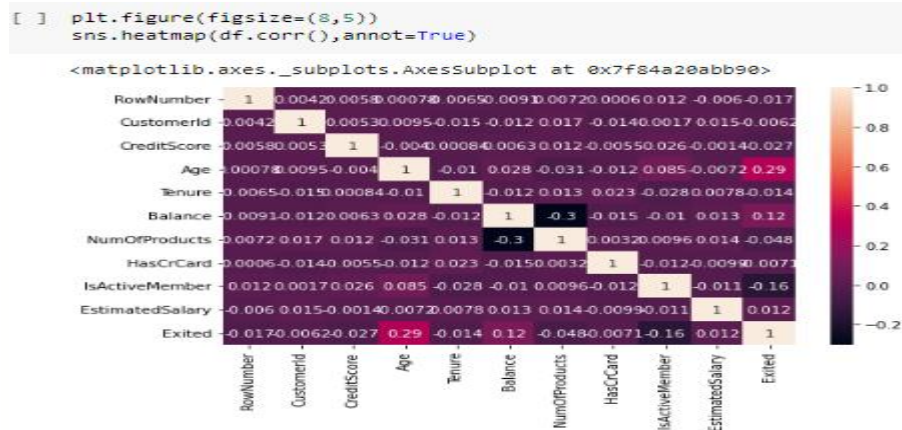
Question 6:

Heat map of dataset features

Solution:

plt.figure(figsize=(8,5))

sns.heatmap(df.corr(),annot=True)



Question 7:

Exploratory data analysis

Solution:

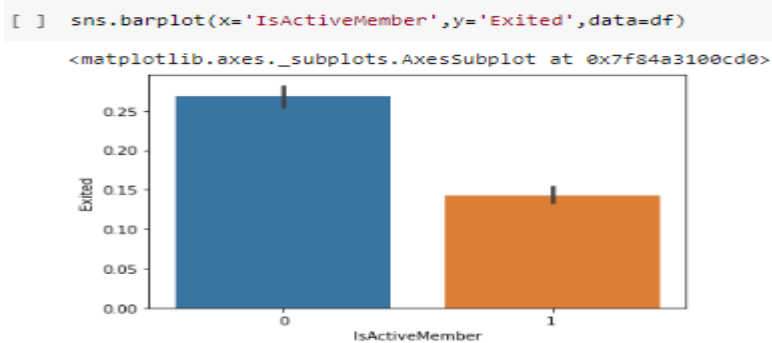
```
df.Exited.value_counts()
```

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

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

```
[ ] df.Exited.value_counts()

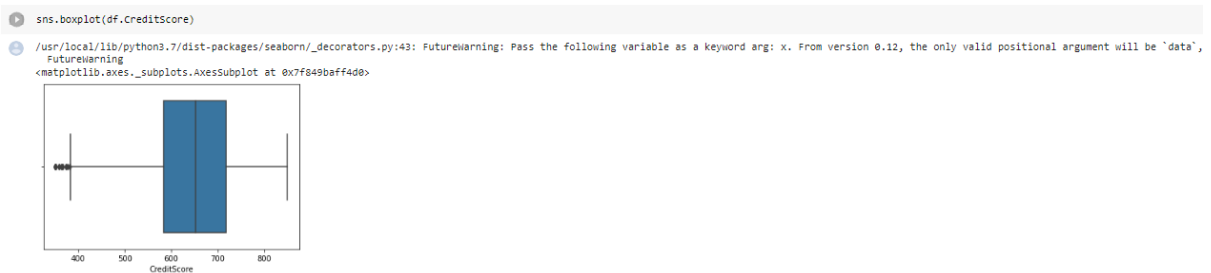
0    7963
1    2037
Name: Exited, dtype: int64
```

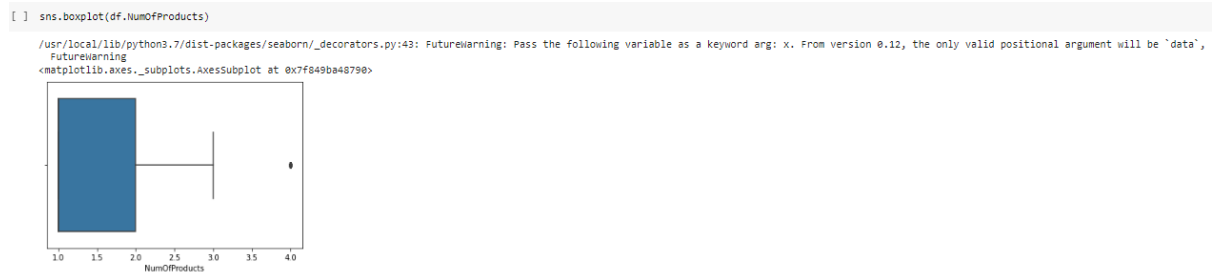


Question 8:

Boxplot

Solution:





Question 9:
dataset info

solution:

```
df.info()
```

```
[ ] df.info()

<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  
8   Balance              10000 non-null  float64 
9   NumOfProducts        10000 non-null  float64 
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(3), int64(8), object(3)
memory usage: 1.1+ MB
```

Question 10:
Preprocessing

Solution:

```
from sklearn.preprocessing import LabelEncoder

le_geo = LabelEncoder()

le_gen = LabelEncoder()

df['Sex']=le_gen.fit_transform(df.Gender)

df['Country']=le_geo.fit_transform(df.Geography)

df.drop(['Geography','Gender'],axis=1,inplace=True)
```

```
[ ] from sklearn.preprocessing import LabelEncoder
le_geo = LabelEncoder()
le_gen = LabelEncoder()
df['Sex']=le_gen.fit_transform(df.Gender)
df['Country']=le_geo.fit_transform(df.Geography)
df.drop(['Geography','Gender'],axis=1,inplace=True)
```

Question 11:

Preprocessing 1

Solution:

```
from sklearn.preprocessing import StandardScaler
```

```
sc=StandardScaler()
```

```
X = sc.fit_transform(X)
```

```
[ ] from sklearn.preprocessing import StandardScaler  
    sc=StandardScaler()  
    X = sc.fit_transform(X)
```

```
[ ] from sklearn.model_selection import train_test_split  
    x_train,x_test,y_train,y_test=train_test_split(X,y,test_size=0.2,  
                                                    random_state=42)
```

```
[ ] x_train.shape, x_test.shape, y_train.shape, y_test.shape  
  
    ((8000, 10), (2000, 10), (8000,), (2000,))
```