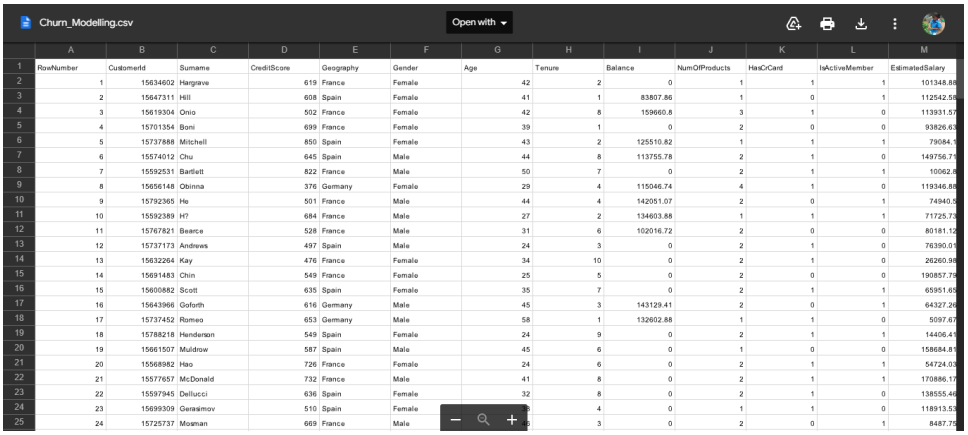
Assignment Date	19september
Student Name	N.Abiram
Student Roll Number	962719106001
Maximum Mark	2 mark

Question –1

1. Download the dataset:



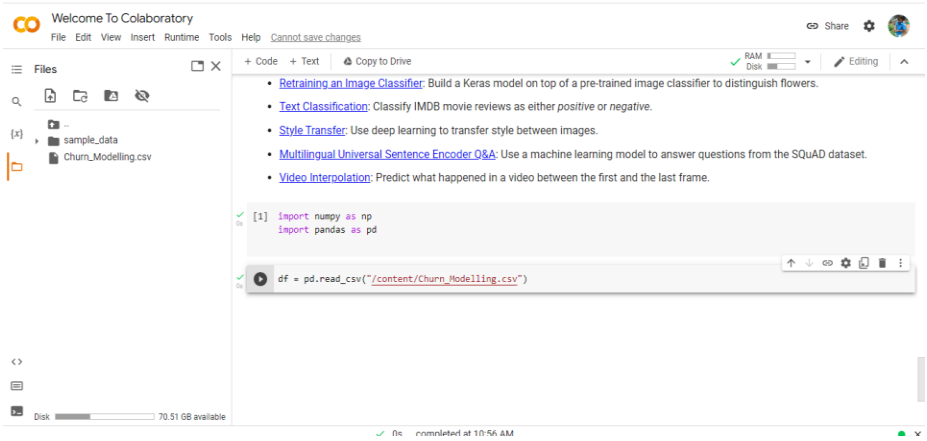
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	RowNumber	CustomerId	Surname	CreditScore	Geography	Gender	Age	Tenure	Balance	NumOfProducts	HasCrCard	IsActiveMember	EstimatedSalary
2	1	15634602	Hargrave	619	France	Female	42	2	0	1	1	1	101348.88
3	2	15647311	Hill	608	Spain	Female	41	1	83807.86	1	0	1	112542.58
4	3	15619304	Onio	502	France	Female	42	8	159660.8	3	1	0	113931.57
5	4	15701354	Boni	699	France	Female	39	1	0	2	0	0	93826.63
6	5	15737888	Mitchell	850	Spain	Female	43	2	125510.82	1	1	1	79084.1
7	6	15574012	Chu	645	Spain	Male	44	8	113755.78	2	1	0	149756.71
8	7	15592531	Bartlett	822	France	Male	50	7	0	2	1	1	10062.8
9	8	15656148	Obinna	376	Germany	Female	29	4	115046.74	4	1	0	119346.88
10	9	15792365	He	501	France	Male	44	4	142051.07	2	0	1	74940.5
11	10	15592389	H?	684	France	Male	27	2	134603.88	1	1	1	71725.73
12	11	15767821	Bearce	528	France	Male	31	6	102016.72	2	0	0	80181.12
13	12	15737173	Andrews	497	Spain	Male	24	3	0	2	1	0	76390.01
14	13	15632264	Kay	476	France	Female	34	10	0	2	1	0	26260.98
15	14	15691483	Chin	549	France	Female	25	5	0	2	0	0	190857.79
16	15	15600882	Scott	635	Spain	Female	35	7	0	2	1	1	65951.65
17	16	15643966	Goforth	616	Germany	Male	45	3	143129.41	2	0	1	64327.26
18	17	15737452	Romeo	653	Germany	Male	58	1	132602.88	1	1	0	5097.67
19	18	15788218	Henderson	549	Spain	Female	24	9	0	2	1	1	14406.41
20	19	15661507	Muldrow	587	Spain	Male	45	6	0	1	0	0	158684.81
21	20	15568982	Hao	726	France	Female	24	6	0	2	1	1	54724.03
22	21	15577657	McDonald	732	France	Male	41	8	0	2	1	1	170886.17
23	22	15597945	Dellucci	636	Spain	Female	32	8	0	2	1	0	138555.46
24	23	15699309	Gerasimov	510	Spain	Female	38	4	0	1	1	0	118913.53
25	24	15725737	Mosman	669	France	Male	46	3	0	2	0	1	8487.75

Question-2

2. Load the dataset.

Solution:

```
import numpy as np

import pandas as pd

df = pd.read_csv("/content/Churn_Modelling.csv")
```



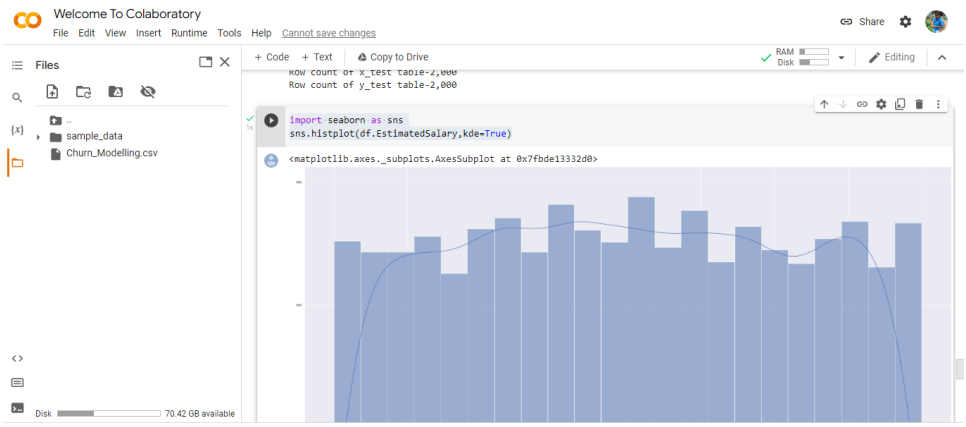
Question_3

3. Perform Below Visualizations.

● Univariate Analysis

Solution:

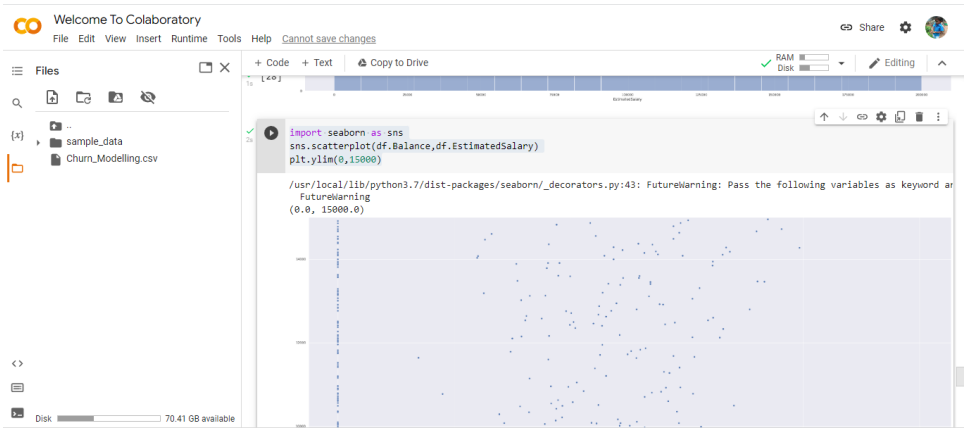
```
import seaborn as sns

sns.histplot(df.EstimatedSalary,kde=True)
```



● Bi - Variate Analysis

Solution:

```
import seaborn as sns

sns.scatterplot(df.Balance,df.EstimatedSalary)

plt.ylim(0,15000)
```



● Multi - Variate Analysis

Solution:

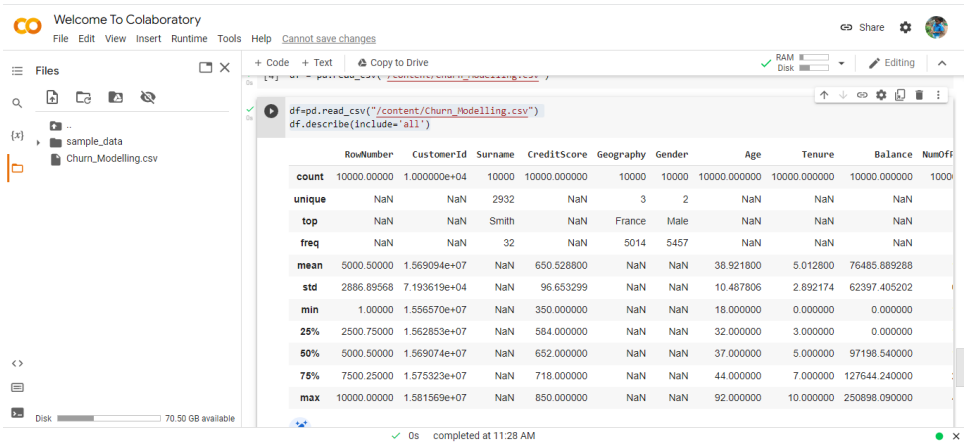
```
import seaborn as sns

df=pd.read_csv("/content/Churn_Modelling.csv")

sns.pairplot(df)
```

Question_4

4. Perform descriptive statistics on the data set

Solution:

```
df=pd.read_csv("/content/Churn_Modelling.csv")

df.describe(include='all')
```



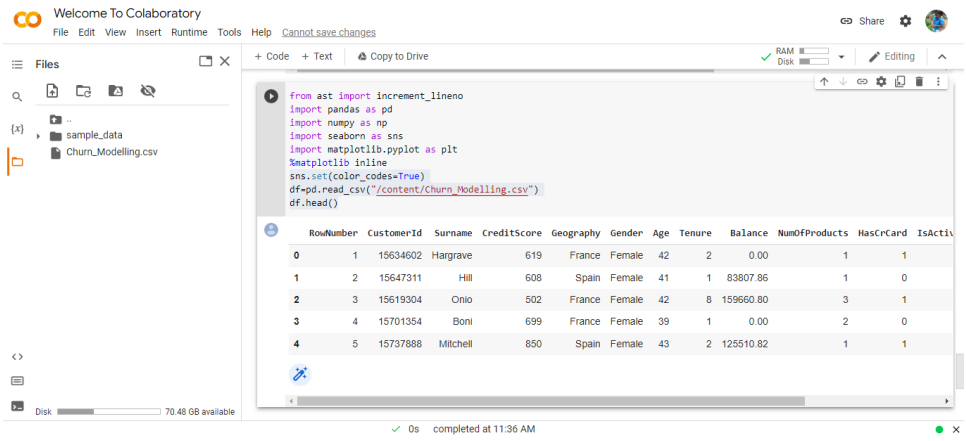
	RowNumber	CustomerId	Surname	CreditScore	Geography	Gender	Age	Tenure	Balance	NumOff
count	10000.00000	1.000000e+04	10000	10000.000000	10000	10000	10000.000000	10000.000000	10000.000000	1000
unique	NaN	NaN	2932	NaN	3	2	NaN	NaN	NaN	
top	NaN	NaN	Smith	NaN	France	Male	NaN	NaN	NaN	
freq	NaN	NaN	32	NaN	5014	5457	NaN	NaN	NaN	
mean	5000.50000	1.569094e+07	NaN	650.528800	NaN	NaN	38.921800	5.012800	76485.889288	
std	2886.89568	7.193619e+04	NaN	96.653299	NaN	NaN	10.487806	2.892174	62397.405202	
min	1.00000	1.556570e+07	NaN	350.000000	NaN	NaN	18.000000	0.000000	0.000000	
25%	2500.75000	1.562853e+07	NaN	584.000000	NaN	NaN	32.000000	3.000000	0.000000	
50%	5000.50000	1.569074e+07	NaN	652.000000	NaN	NaN	37.000000	5.000000	97198.540000	
75%	7500.25000	1.575323e+07	NaN	718.000000	NaN	NaN	44.000000	7.000000	127644.240000	
max	10000.00000	1.581569e+07	NaN	850.000000	NaN	NaN	92.000000	10.000000	250898.090000	

Question_5

5. Handle the Missing values.

Solution:

```
from ast import increment_lineno

import pandas as pd

import numpy as np

import seaborn as sns

import matplotlib.pyplot as plt

%matplotlib inline

sns.set(color_codes=True)

df=pd.read_csv("/content/Churn_Modelling.csv")

df.head()
```

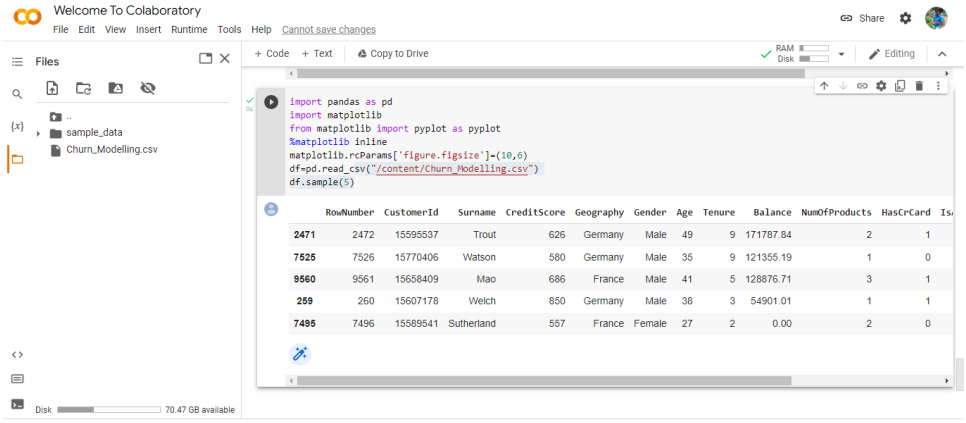


Question_6

6. Find the outliers and replace the outliers

Solution:

```
import pandas as pd
import matplotlib
from matplotlib import pyplot as pyplot
%matplotlib inline
matplotlib.rcParams['figure.figsize']=(10,6)
df=pd.read_csv("/content/Churn_Modelling.csv")
df.sample(5)
```

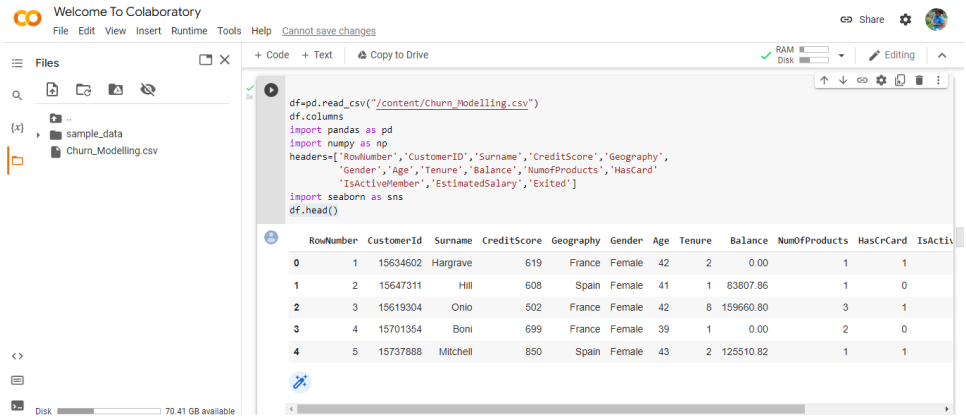


Question_7

7. Check for Categorical columns and perform encoding.

Solution:

```
df=pd.read_csv("/content/Churn_Modelling.csv")
df.columns
import pandas as pd
import numpy as np
headers=['RowNumber','CustomerID','Surname','CreditScore','Geography',
    'Gender','Age','Tenure','Balance','NumofProducts','HasCard'
    'IsActiveMember','EstimatedSalary','Exited']
import seaborn as sns
df.head()
```

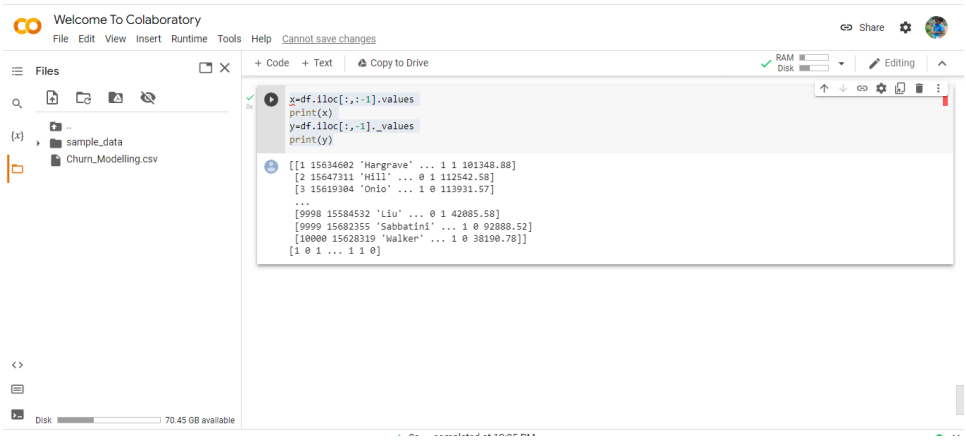


Questioh_8

8. Split the data into dependent and independent variables.

Solution:

```
x=df.iloc[:,:-1].values
print(x)
y=df.iloc[:,-1]._values
print(y)
```

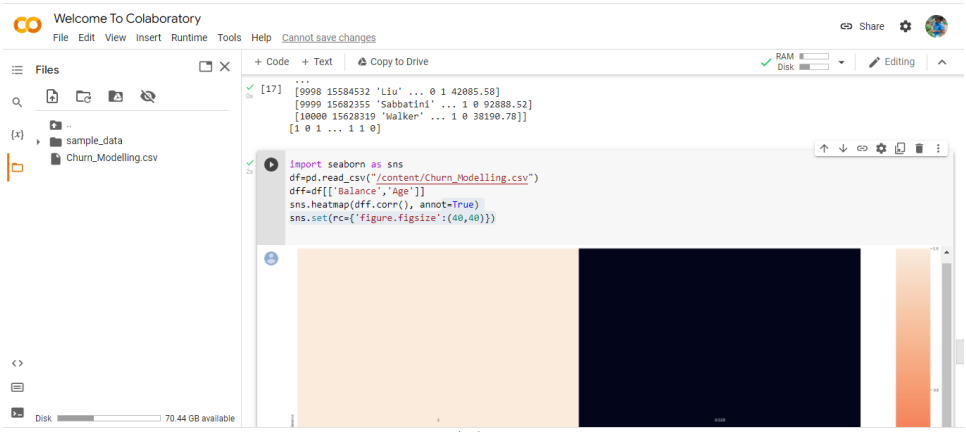


Question_9

9. Scale the independent variables

Solution:

```
import seaborn as sns

df=pd.read_csv("/content/Churn_Modelling.csv")

dff=df[['Balance','Age']]

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

sns.set(rc={'figure.figsize':(40,40)})
```



Question_10

10. Split the data into training and testing

Solution:

```
from scipy.sparse.construct import random
```

```
x=df.iloc[:, 1:2].values

y=df.iloc[:,2].values

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=0)

print('Row count of x_train table'+'-'+str(f"{len(x_train):,}"))

print('Row count of y_train table'+'-'+str(f"{len(y_train):,}"))

print('Row count of x_test table'+'-'+str(f"{len(x_test):,}"))

print('Row count of y_test table'+'-'+str(f"{len(y_test):,}"))
```