Assignment Date	28 September 2022
Student Name	M Selvakumar
Student Roll Number	913119104091
Maximum Marks	2 Marks

ASSIGNMENT

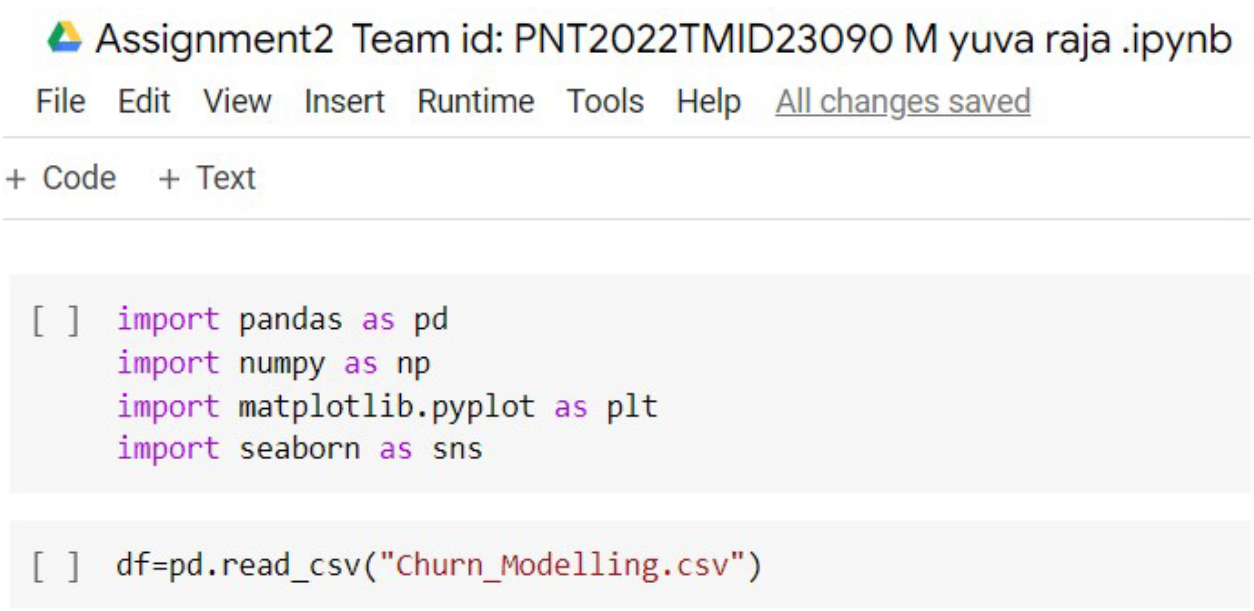
2

Queston-1:

Download the dataset

Queston-2:

Load the dataset:



```
df
```

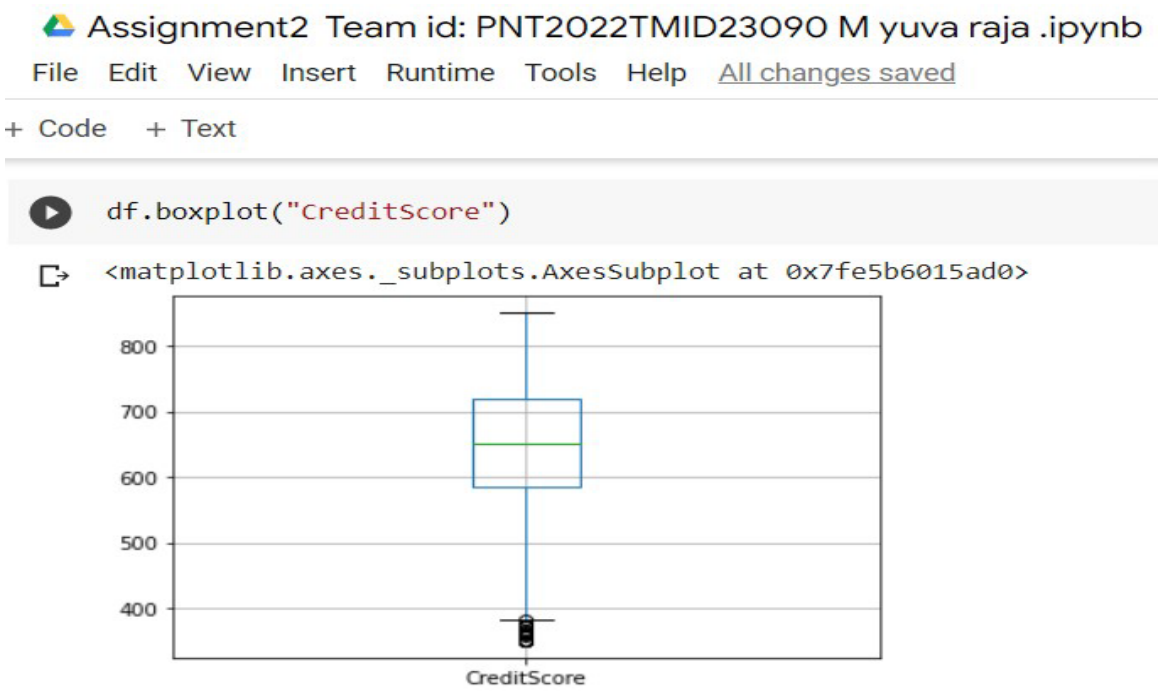
	RowNumber	CustomerId	Surname	CreditScore	Geography	Gender	Age	Tenure	Balance	NumOfProducts	HasCrCard	IsActiveMember	EstimatedSalary	Exited
0	1	15634602	Hargrave	619	France	Female	42	2	0.00	1	1	1	101348.88	1
1	2	15647311	Hill	608	Spain	Female	41	1	83807.86	1	0	1	112542.58	0
2	3	15619304	Onio	502	France	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
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9995	9996	15606229	Obijiaku	771	France	Male	39	5	0.00	2	1	0	96270.64	0
9996	9997	15569892	Johnstone	516	France	Male	35	10	57369.61	1	1	1	101699.77	0
9997	9998	15584532	Liu	709	France	Female	36	7	0.00	1	0	1	42085.58	1
9998	9999	15682355	Sabbatini	772	Germany	Male	42	3	75075.31	2	1	0	92888.52	1
9999	10000	15628319	Walker	792	France	Female	28	4	130142.79	1	1	0	38190.78	0

10000 rows × 14 columns

Queston-3:

Perform Below Visualizations.

Univariate Analysis Bi - Variate Analysis Mult - Variate Analysis



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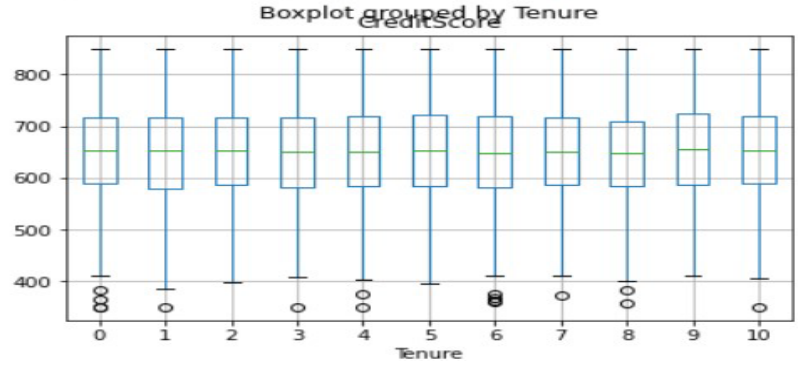
```
df.boxplot("CreditScore","Tenure")
```

```
/usr/local/lib/python3.7/dist-packages/matplotlib/cbook/__init__.
  X = np.atleast_1d(X.T if isinstance(X, np.ndarray) else np.asar
<matplotlib.axes._subplots.AxesSubplot at 0x7fe5b5a4fc90>
```



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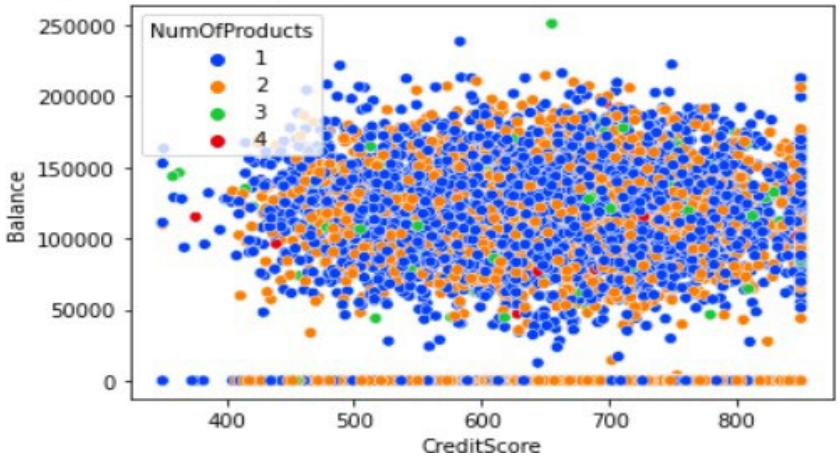
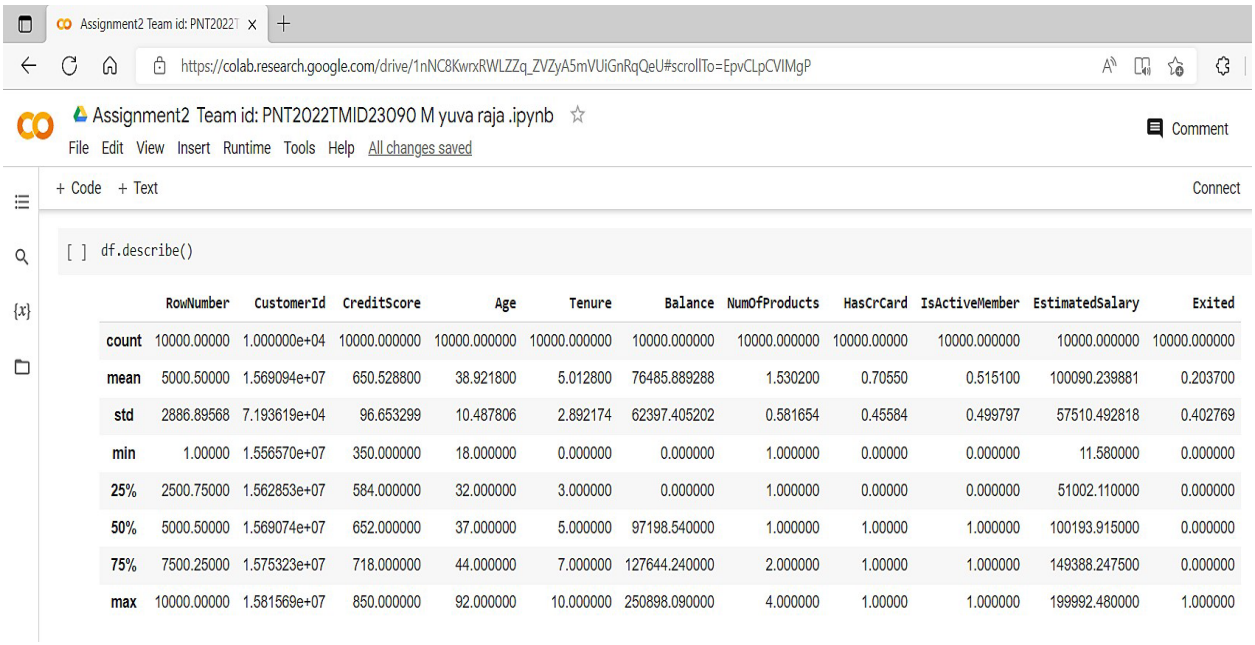
```
[ ]  sns.scatterplot(x='CreditScore',y='Balance',data=df,palette='bri
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7fe5b57aaf50>
```



Queston-4:

Perform descriptive statistics on the dataset



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https://colab.research.google.com/drive/1nNC8KwrxRWLZZq_ZVZyA5mVUiGnRqQeU#scrollTo=EpvCLpCVIMgP

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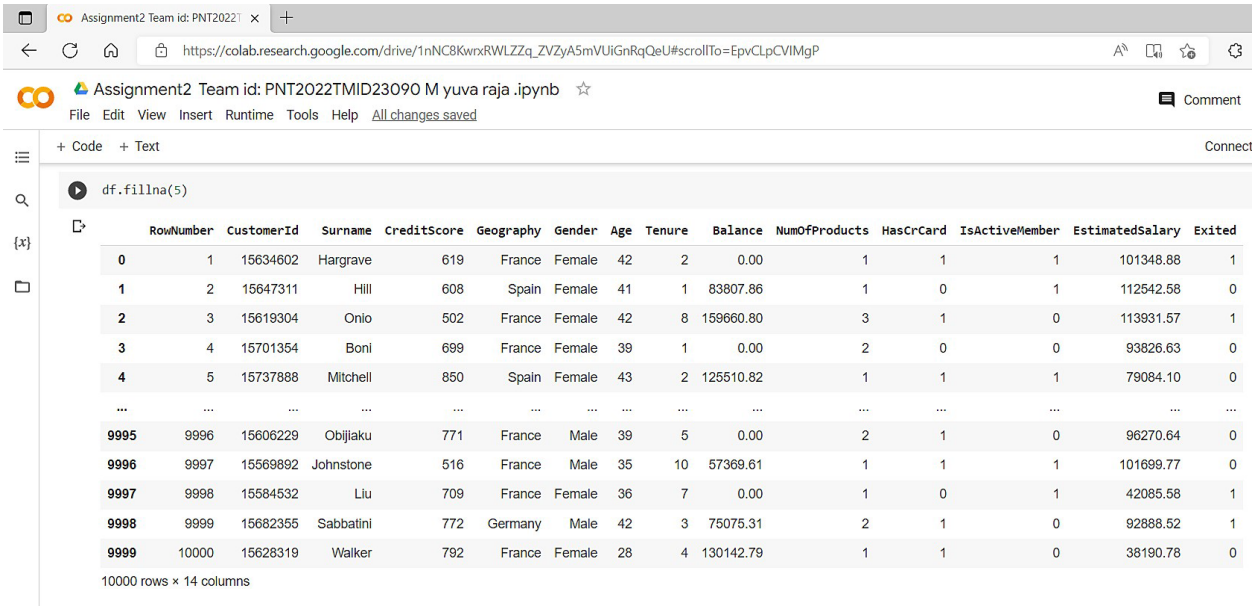
```
[ ] df.describe()
```

	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
25%	2500.75000	1.562853e+07	584.000000	32.000000	3.000000	0.000000	1.000000	0.00000	0.000000	51002.110000	0.000000
50%	5000.50000	1.569074e+07	652.000000	37.000000	5.000000	97198.540000	1.000000	1.00000	1.000000	100193.915000	0.000000
75%	7500.25000	1.575323e+07	718.000000	44.000000	7.000000	127644.240000	2.000000	1.00000	1.000000	149388.247500	0.000000
max	10000.00000	1.581569e+07	850.000000	92.000000	10.000000	250898.090000	4.000000	1.00000	1.000000	199992.480000	1.000000

Queston-5:

Handle the Missing values



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https://colab.research.google.com/drive/1nNC8KwrxRWLZZq_ZVZyA5mVUiGnRqQeU#scrollTo=EpvCLpCVIMgP

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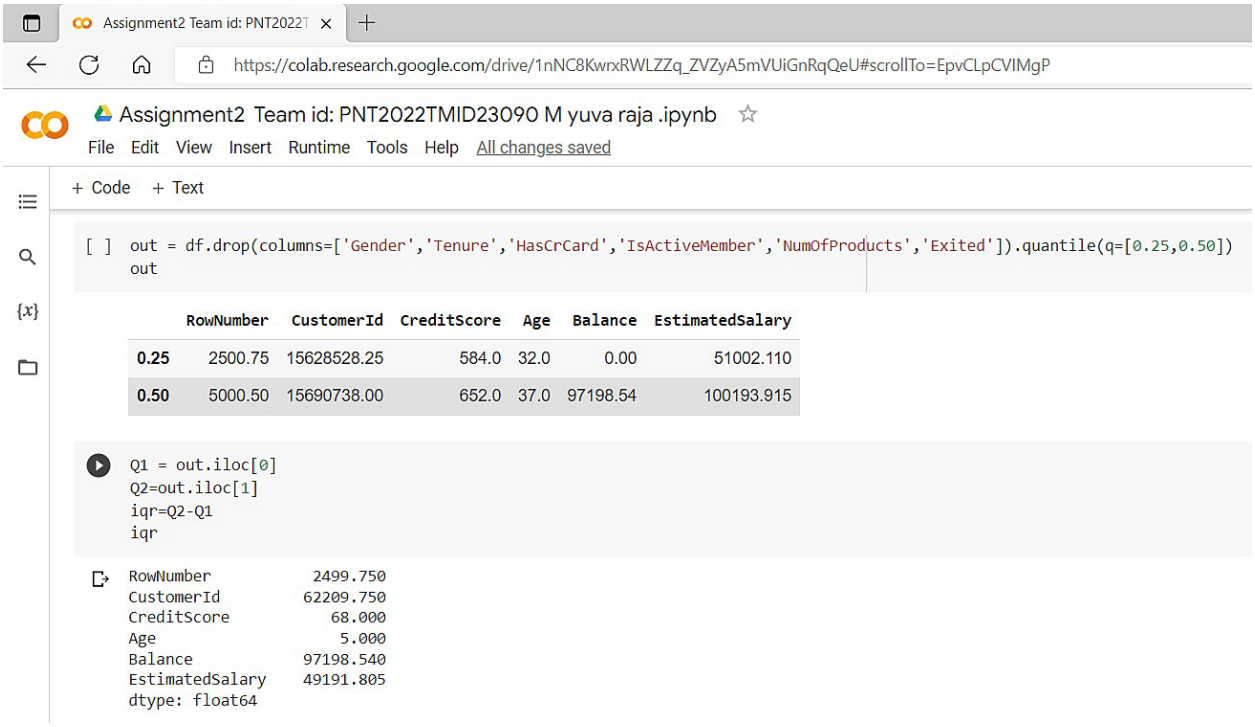
```
df.fillna(5)
```

	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
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9995	9996	15606229	Obijiaku	771	France	Male	39	5	0.00	2	1	0	96270.64	0
9996	9997	15569892	Johnstone	516	France	Male	35	10	57369.61	1	1	1	101699.77	0
9997	9998	15584532	Liu	709	France	Female	36	7	0.00	1	0	1	42085.58	1
9998	9999	15682355	Sabbatini	772	Germany	Male	42	3	75075.31	2	1	0	92888.52	1
9999	10000	15628319	Walker	792	France	Female	28	4	130142.79	1	1	0	38190.78	0

10000 rows × 14 columns

Queston-6:

Find the outliers & replace the outliers



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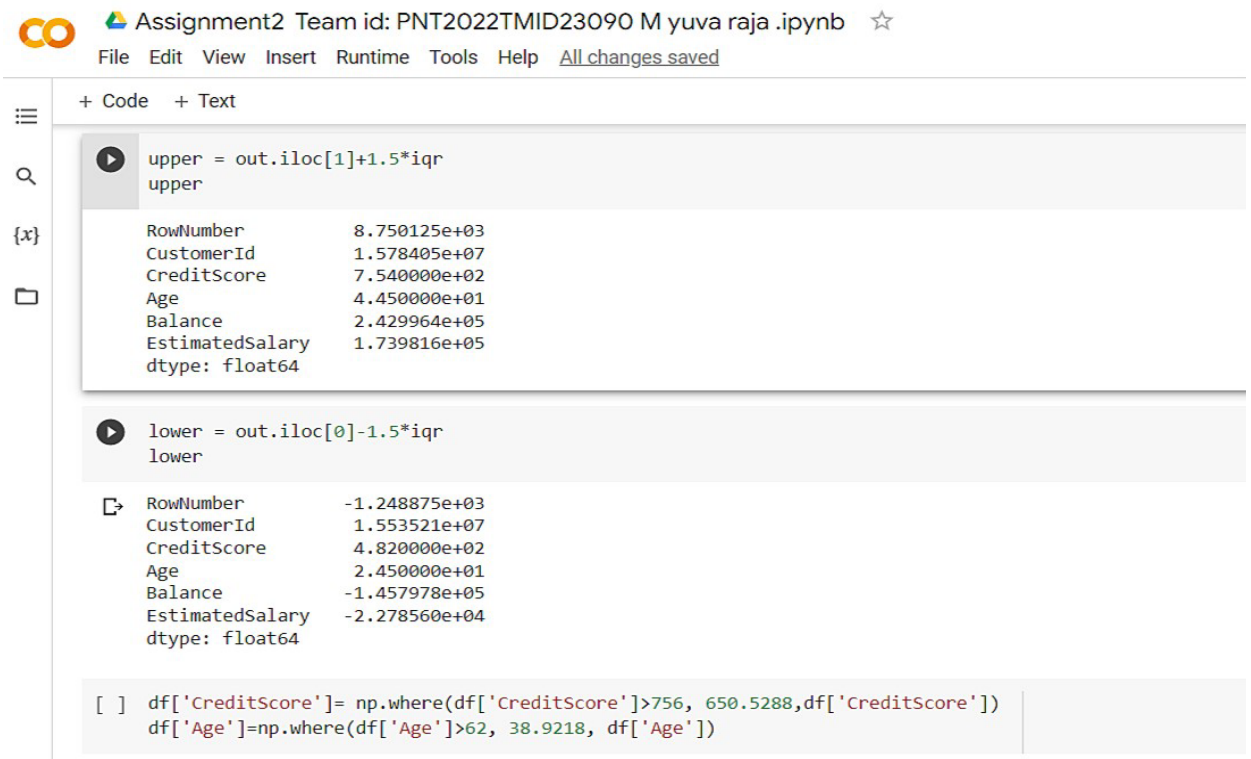
```
[ ] out = df.drop(columns=['Gender','Tenure','HasCrCard','IsActiveMember','NumOfProducts','Exited']).quantile(q=[0.25,0.50])
    out
```

	RowNumber	CustomerId	CreditScore	Age	Balance	EstimatedSalary
0.25	2500.75	15628528.25	584.0	32.0	0.00	51002.110
0.50	5000.50	15690738.00	652.0	37.0	97198.54	100193.915

```
Q1 = out.iloc[0]
Q2=out.iloc[1]
iqr=Q2-Q1
iqr
```

```
RowNumber          2499.750
CustomerId        62209.750
CreditScore          68.000
Age                   5.000
Balance           97198.540
EstimatedSalary   49191.805
dtype: float64
```



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```
upper = out.iloc[1]+1.5*iqr
upper
```

```
RowNumber          8.750125e+03
CustomerId         1.578405e+07
CreditScore        7.540000e+02
Age                4.450000e+01
Balance            2.429964e+05
EstimatedSalary    1.739816e+05
dtype: float64
```

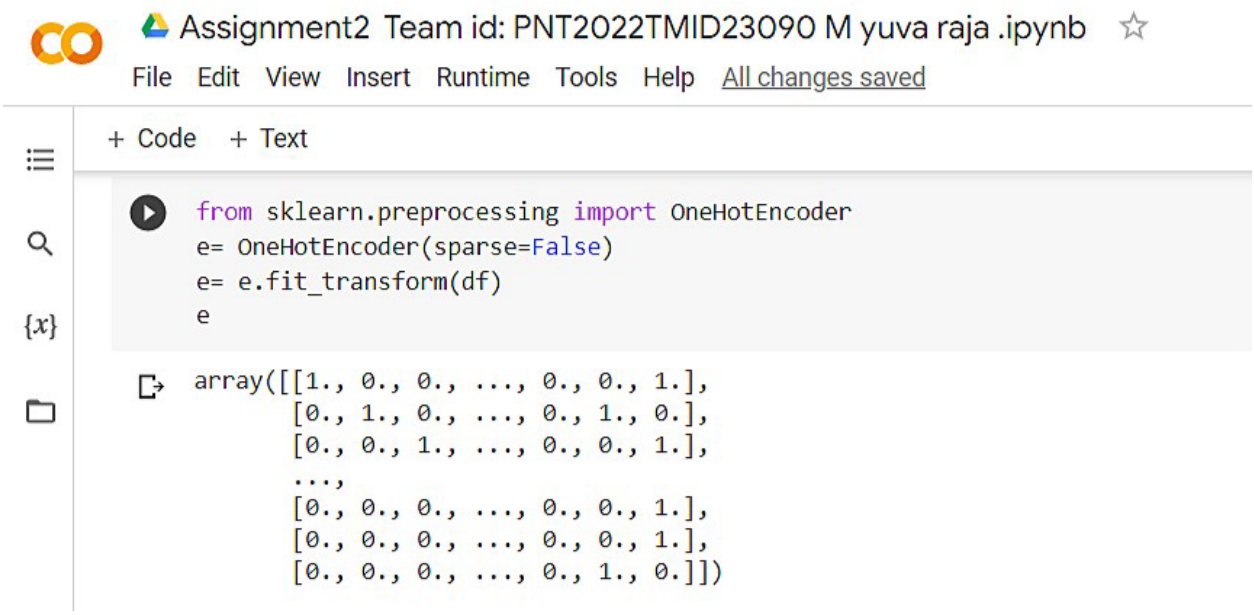
```
lower = out.iloc[0]-1.5*iqr
lower
```

```
RowNumber         -1.248875e+03
CustomerId         1.553521e+07
CreditScore        4.820000e+02
Age                2.450000e+01
Balance           -1.457978e+05
EstimatedSalary   -2.278560e+04
dtype: float64
```

```
[ ] df['CreditScore']= np.where(df['CreditScore']>756, 650.5288,df['CreditScore'])
    df['Age']=np.where(df['Age']>62, 38.9218, df['Age'])
```

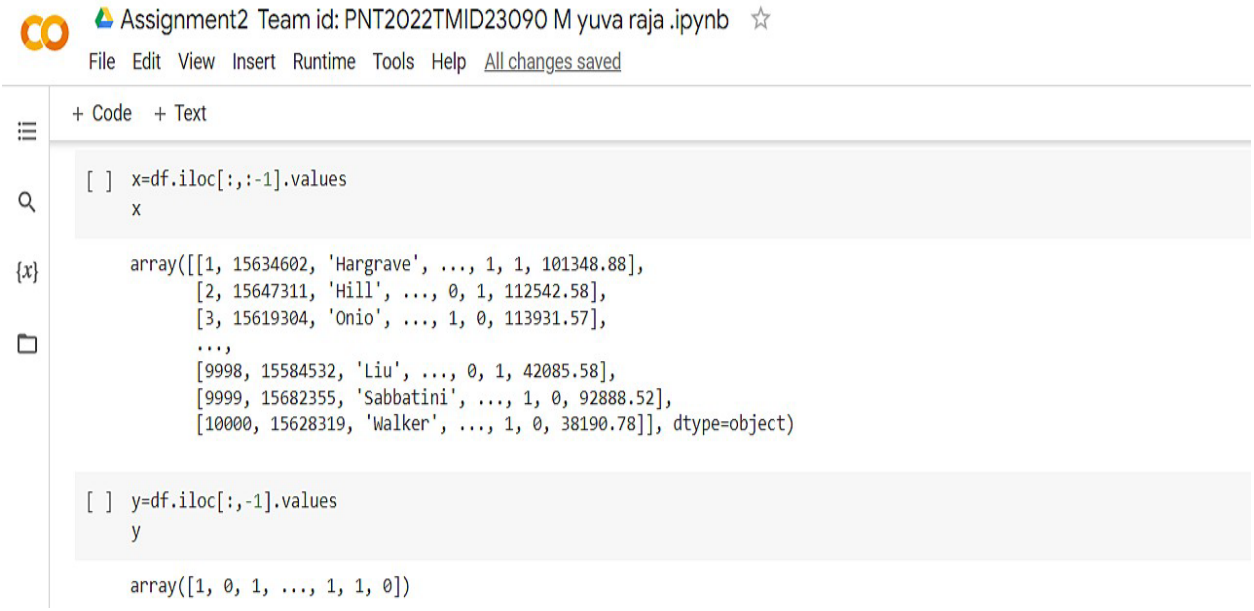
Queston-7:

Check for Categorical columns and perform encoding



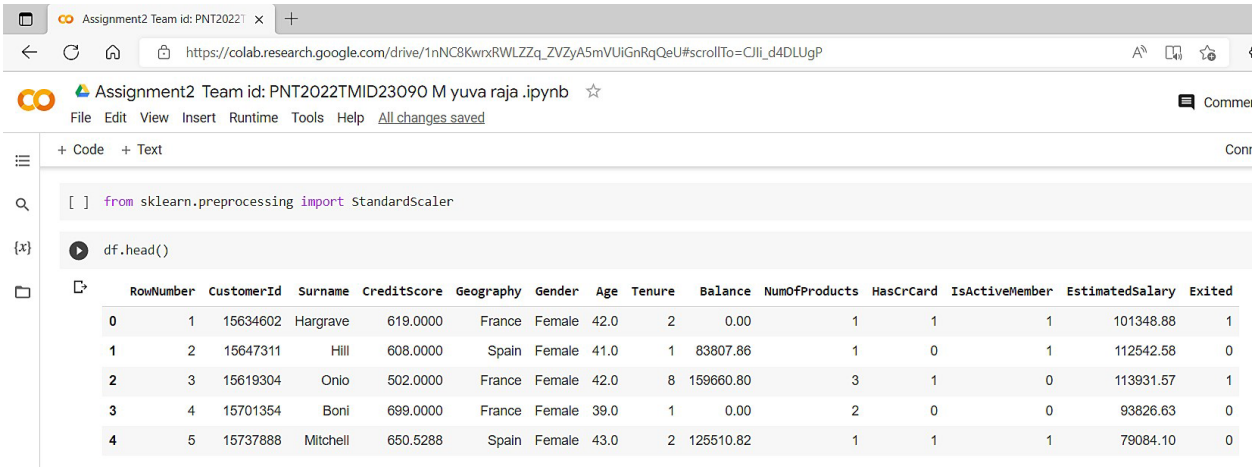
Queston-8:

Split the data into dependent and independent variables.



Queston-9:

Scale the independent variables



	RowNumber	CustomerId	Surname	CreditScore	Geography	Gender	Age	Tenure	Balance	NumOfProducts	HasCrCard	IsActiveMember	EstimatedSalary	Exited
0	1	15634602	Hargrave	619.0000	France	Female	42.0	2	0.00	1	1	1	101348.88	1
1	2	15647311	Hill	608.0000	Spain	Female	41.0	1	83807.86	1	0	1	112542.58	0
2	3	15619304	Onio	502.0000	France	Female	42.0	8	159660.80	3	1	0	113931.57	1
3	4	15701354	Boni	699.0000	France	Female	39.0	1	0.00	2	0	0	93826.63	0
4	5	15737888	Mitchell	650.5288	Spain	Female	43.0	2	125510.82	1	1	1	79084.10	0

Queston-10:

Split the data into training & testing