Assignment -2

Python Programming

Assignment Date	19 September 2022
Student Name	Vasanthkumar D
Maximum Marks	2 Marks

Question-1:

Download the dataset: Dataset

Solution:

https://drive.google.com/file/d/1_HcM0K8wt4b7FMLkc1V1dv0y6I_9ULzy/view

Question-2:

Load the dataset.

Solution:

```
# Read Dataset
data = pd.read_csv('/content/Churn_Modelling.csv')
data = data.iloc[:,3:]
data
```

	CreditScore	Geography	Gender	Age	Tenure	Balance	NumOfProducts	HasCrCard	IsActiveMember	EstimatedSalary	Exited
0	619	France	Female	42	2	0.00	1	1	1	101348.88	1
1	608	Spain	Female	41	1	83807.86	1	0	1	112542.58	0
2	502	France	Female	42	8	159660.80	3	1	0	113931.57	1
3	699	France	Female	39	1	0.00	2	0	0	93826.63	0
4	850	Spain	Female	43	2	125510.82	1	1	1	79084.10	0
...	...	...	...	...	...	...	...	...	...	...	...
9995	771	France	Male	39	5	0.00	2	1	0	96270.64	0
9996	516	France	Male	35	10	57369.61	1	1	1	101699.77	0
9997	709	France	Female	36	7	0.00	1	0	1	42085.58	1
9998	772	Germany	Male	42	3	75075.31	2	1	0	92888.52	1
9999	792	France	Female	28	4	130142.79	1	1	0	38190.78	0

10000 rows × 11 columns

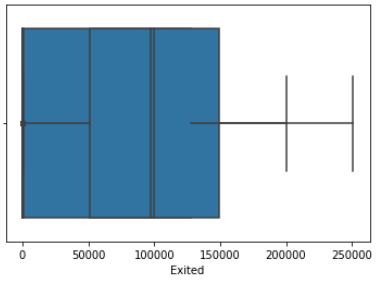
Question-3:

Perform Below Visualizations.

- Univariate Analysis
- Bi - Variate Analysis
- Multi - Variate Analysis

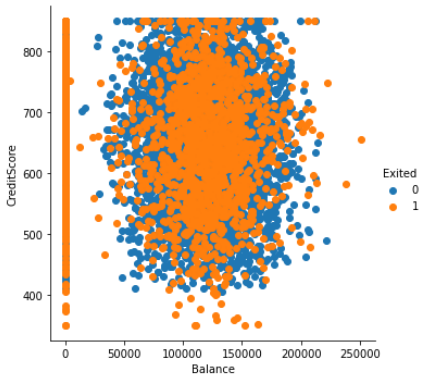
Solution:

```
# 1. Univariate Analysis
for col in data.columns:
  if data.dtypes[col]=='int64' or data.dtypes[col]=='float64':
    sns.boxplot(x=data[col]).set(xlabel=col)
```




```
# 2. Bi-Variate Analysis
sns.FacetGrid(data,hue='Exited',size=5).map(plt.scatter,"Balance","CreditScore").add_legend()
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/axisgrid.py:337: UserWarning: The `size` parameter has been renamed to `height`; please update your c
ode.
  warnings.warn(msg, UserWarning)
```



Question-4:

Perform descriptive statistics on the dataset.

Solution:

```
data.describe()
```

	CreditScore	Age	Tenure	Balance	NumOfProducts	HasCrCard	IsActiveMember	EstimatedSalary	Exited
count	10000.000000	10000.000000	10000.000000	10000.000000	10000.000000	10000.00000	10000.000000	10000.000000	10000.000000
mean	650.528800	38.921800	5.012800	76485.889288	1.530200	0.70550	0.515100	100090.239881	0.203700
std	96.653299	10.487806	2.892174	62397.405202	0.581654	0.45584	0.499797	57510.492818	0.402769
min	350.000000	18.000000	0.000000	0.000000	1.000000	0.00000	0.000000	11.580000	0.000000
25%	584.000000	32.000000	3.000000	0.000000	1.000000	0.00000	0.000000	51002.110000	0.000000
50%	652.000000	37.000000	5.000000	97198.540000	1.000000	1.00000	1.000000	100193.915000	0.000000
75%	718.000000	44.000000	7.000000	127644.240000	2.000000	1.00000	1.000000	149388.247500	0.000000
max	850.000000	92.000000	10.000000	250898.090000	4.000000	1.00000	1.000000	199992.480000	1.000000

Question-5:

Handle the Missing values.

Solution:

```
data.isnull().sum()
```

```
CreditScore        0
Geography          0
Gender             0
Age                0
Tenure             0
Balance            0
NumOfProducts      0
HasCrCard          0
IsActiveMember     0
EstimatedSalary    0
Exited             0
dtype: int64
```

Question-6:

Find the outliers and replace the outliers

Solution:

```
credit = data.loc[data['CreditScore']<400, 'CreditScore'].median()
prod = data.loc[data['NumOfProducts']>=3.5, 'NumOfProducts'].median()
data.loc[data.CreditScore<400, 'CreditScore']=np.nan
data.fillna(credit,inplace=True)
data.loc[data.NumOfProducts>3, 'NumOfProducts']=np.nan
data.fillna(prod,inplace=True)
```

Question-7:

Check for Categorical columns and perform encoding.

Solution:

```
label = LabelEncoder()
data['Geography'] = label.fit_transform(data['Geography'])
data['Gender'] = label.fit_transform(data['Gender'])
```

Question-8:

Split the data into dependent and independent variables.

Solution:

```
dep = data.iloc[:,-1:]
indep = data.iloc[:,:-1]
```

Question-9:

Scale the independent variables

Solution:

```
indep_var = MinMaxScaler()
show_indep = indep_var.fit_transform(indep)
```

Question-10:

Split the data into training and testing

Solution:

```
xtrain,xtest,ytrain,ytest = train_test_split(show_indep, dep, test_size=0.3)
print(xtrain,xtest,ytrain,ytest)
```

```
[[0.69484536 1.         1.         ... 1.         0.         0.49826033]
 [0.49072165 0.5        1.         ... 1.         1.         0.46418978]
 [0.26597938 0.         1.         ... 1.         1.         0.12240099]
 ...
 [0.70515464 0.         1.         ... 1.         1.         0.38749191]
 [0.43092784 1.         0.         ... 0.         0.         0.92833226]
 [0.76494845 0.         1.         ... 0.         1.         0.4245851 ]] [[0.34845361 0.         0.         ... 1.         1.         0.35087061]
 [0.53195876 0.         1.         ... 1.         1.         0.33056902]
 [0.28865979 0.5        1.         ... 1.         1.         0.29006955]
 ...
 [0.83917526 0.5        1.         ... 1.         1.         0.60536606]
 [0.75670103 0.5        0.         ... 1.         0.         0.60426406]
 [0.66185567 0.5        0.         ... 0.         0.         0.39309194]]       Exited
1076       0
64         0
2908       0
4415       0
1154       0
...      ...
1079       0
9760       0
5048       0
2684       0
9081       0

[7000 rows x 1 columns]       Exited
442        0
3865       0
1217       0
3728       0
1827       1
...      ...
1392       0
6629       0
9590       0
9492       1
3211       0

[3000 rows x 1 columns]
```