Data Collection and Preprocessing Phase

Date	02 June 2024
Team ID	737568
Project Title	AutoForesight : A Predictive Model for Streamlining Car Loan Repayment Planning
Maximum Marks	6 Marks

Data Exploration and Preprocessing Template

Identifies data sources, assesses quality issues like missing values and duplicates, and implements resolution plans to ensure accurate and reliable analysis.

Section	Description
Data Overview	dataset ID Client_Income Car_Owned Bike_Owned Active_Loan House_Own Child_Count Credit_Amount Loan_Annuity Accompany_Client ... Client_Permanent 0 12142509 6750 0.0 0.0 1.0 0.0 0.0 61190.55 3416.85 Alone ... 1 12138936 20250 1.0 0.0 1.0 NaN 0.0 15282 1826.55 Alone ... 2 12181264 18000 0.0 0.0 1.0 0.0 1.0 59527.35 2788.2 Alone ... 3 12188929 15750 0.0 0.0 1.0 1.0 0.0 53870.4 2295.45 Alone ... 4 12133385 33750 1.0 0.0 1.0 0.0 2.0 133988.4 3547.35 Alone ... ... 121851 12207714 29250 0.0 0.0 NaN 1.0 0.0 107820 3165.3 Relative ... 121852 12173765 15750 0.0 1.0 1.0 0.0 0.0 104256 3388.05 Alone ... 121853 12103937 8100 0.0 1.0 0.0 1.0 1.0 55107.9 2989.35 Alone ... 121854 12170623 38250 1.0 1.0 0.0 1.0 0.0 45000 2719.35 Alone ... 121855 12105610 9000 1.0 1.0 1.0 1.0 1.0 62428.95 4201.65 Alone ... 121856 rows × 40 columns

<table>
<tr>
<td>Univariate Analysis</td>
<td>

```
print("Client Income")
churn_customers['Client_Income'].describe()
```

```
Client Income
count      9566
unique      322
top       13500
freq       1058
Name: Client_Income, dtype: object
```

```
print("Credit Amount")
churn_customers['Credit_Amount'].describe()
```

```
Credit Amount
count      9570.0
unique     2251.0
top       45000.0
freq        303.0
Name: Credit_Amount, dtype: float64
```

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<tr>
<td>Bivariate Analysis</td>
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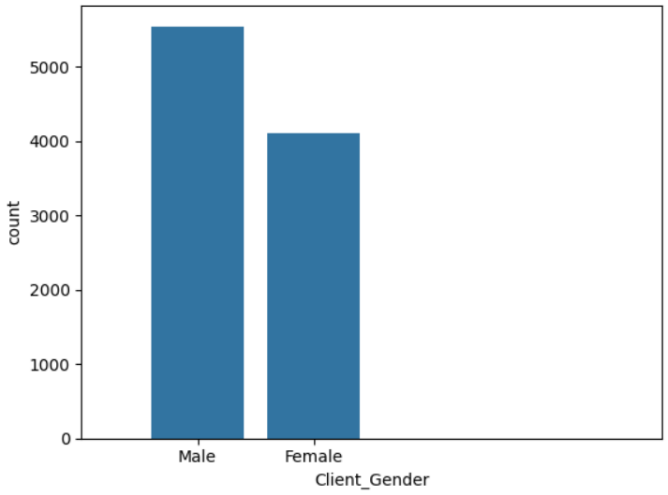
```
sns.countplot(x = "Client_Gender",data = churn_customers)
plt.xlim(-1,4)
```

```
(-1.0, 4.0)
```



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<tr>
<td colspan="2">Data Preprocessing Code Screenshots</td>
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Loading Data

```
#Reading the dataset

dataset=pd.read_csv(r"D:\Documents\dataset\train.csv")
```

```
C:\Users\Sharan\AppData\Local\Temp\ipykernel_5604\3481427543.py:1: DtypeWarning: Columns (1,7,8,16,17,18,19,20,35) have mixed types. Specify dtype option o
n import or set low_memory=False.
  dataset=pd.read_csv(r"D:\Documents\dataset\train.csv")
```

```
dataset
```

	ID	Client_Income	Car_Owned	Bike_Owned	Active_Loan	House_Own	Child_Count	Credit_Amount	Loan_Annuity	Accompany_Client	...	Client_Permanent
0	12142509	6750	0.0	0.0	1.0	0.0	0.0	61190.55	3416.85	Alone	...	
1	12138936	20250	1.0	0.0	1.0	NaN	0.0	15282	1826.55	Alone	...	
2	12181264	18000	0.0	0.0	1.0	0.0	1.0	59527.35	2788.2	Alone	...	
3	12188929	15750	0.0	0.0	1.0	1.0	0.0	53870.4	2295.45	Alone	...	
4	12133385	33750	1.0	0.0	1.0	0.0	2.0	133988.4	3547.35	Alone	...	
...	...	...	...	...	...	...	...	...	...	...	...	...
121851	12207714	29250	0.0	0.0	NaN	1.0	0.0	107820	3165.3	Relative	...	

Handling Missing Data

```
# [Data Pre-Processing] -Handling missing values

dataset= dataset.drop(['Credit_Bureau','Social_Circle_Default','Age_Days','Employed_Days','Score_Source_1','Score_Source_2','Score_Source_3','Registration_
dataset.head()
```

	ID	Client_Income	Car_Owned	Bike_Owned	Active_Loan	House_Own	Child_Count	Credit_Amount	Loan_Annuity	Accompany_Client	...	Client_Housing_Type	P
0	12142509	6750	0.0	0.0	1.0	0.0	0.0	61190.55	3416.85	Alone	...	Home	
1	12138936	20250	1.0	0.0	1.0	NaN	0.0	15282	1826.55	Alone	...	Home	
2	12181264	18000	0.0	0.0	1.0	0.0	1.0	59527.35	2788.2	Alone	...	Family	
3	12188929	15750	0.0	0.0	1.0	1.0	0.0	53870.4	2295.45	Alone	...	Home	
4	12133385	33750	1.0	0.0	1.0	0.0	2.0	133988.4	3547.35	Alone	...	Home	

5 rows × 25 columns

Data Transformation

```
# -Handling Categorical Values
```

```
dataset['Client_Income'] = pd.to_numeric(dataset['Client_Income'],errors='coerce')
```

```
dataset['Credit_Amount'] = pd.to_numeric(dataset['Credit_Amount'],errors='coerce')
```

```
dataset['Population_Region_Relative'] = pd.to_numeric(dataset['Population_Region_Relative'],errors='coerce')
```

```
dataset['Loan_Annuity'] = pd.to_numeric(dataset['Loan_Annuity'],errors='coerce')
```

Feature Engineering

```
# -Filling Missing Values and Creating data frame

from mlxtend.preprocessing import TransactionEncoder
column_names=['ID','Client_Income','Car_Owned','Bike_Owned','Active_Loan','House_Own','Child_Count','Credit_Amount','Loan_Annuity','Accompany_Client','Clie
```

```
#Create dataframes

loan_data=pd.DataFrame(result,columns=column_names)
loan_data
```

	ID	Client_Income	Car_Owned	Bike_Owned	Active_Loan	House_Own	Child_Count	Credit_Amount	Loan_Annuity	Accompany_Client	...	Client_Housing_
0	12132045.0	27000.0	0.0	1.0	1.0	1.0	0.0	60750.00	7222.50	1.0	...	
1	12196654.0	13500.0	0.0	1.0	1.0	1.0	0.0	28440.00	1851.30	1.0	...	
2	12201738.0	13500.0	1.0	0.0	1.0	1.0	0.0	18000.00	900.00	1.0	...	
3	12131195.0	15750.0	0.0	1.0	1.0	1.0	0.0	59301.00	1746.90	1.0	...	
4	12214557.0	13500.0	0.0	1.0	1.0	0.0	0.0	30234.15	1840.05	1.0	...	
...	...	...	...	...	...	...	...	...	...	...	...	...
224017	12136406.0	12150.0	0.0	0.0	1.0	0.0	0.0	78192.00	2383.65	1.0	...	
224018	12173765.0	15750.0	0.0	1.0	1.0	0.0	0.0	104256.00	3388.05	1.0	...	
224019	12103937.0	8100.0	0.0	1.0	0.0	1.0	1.0	55107.90	2989.35	1.0	...	
224020	12170623.0	38250.0	1.0	1.0	0.0	1.0	0.0	45000.00	2719.35	1.0	...	
224021	12105610.0	9000.0	1.0	1.0	1.0	1.0	1.0	62428.95	4201.65	1.0	...	

224022 rows × 25 columns