

Data Collection and Preprocessing Phase

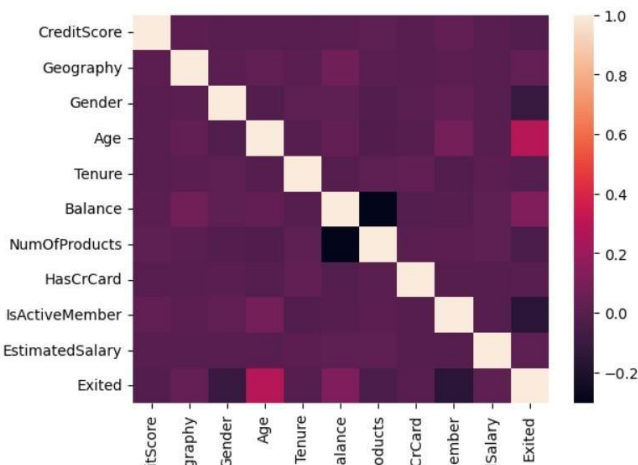
Section	Description																																																																																																																																																																																																																																										
Data Overview	<div>Basic statistics, dimensions, and structure of the data.</div> <div><pre>[22]: 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Univariate Analysis	Exploration of individual variables (mean, median, mode, etc..)																																																																																																																																																																																																																																										

Bivariate Analysis	Relationships between two variables (correlation, scatter plots).
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Date	15 July 2024
Team ID	740671
Project Title	Telecom Customer Churn Prediction
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.

	<pre>1]: sns.heatmap(data.corr(),annot=False)</pre> <pre>1]: <Axes: ></pre> 
Multivariate Analysis	-
Outliers and Anomalies	-
Data Preprocessing Code Screenshots	
Loading Data	<p>Code to load the dataset into the preferred environment (e.g., Python, R).</p> <pre>2]: #Reading the dataset dt=pd.read_csv(r"Churn_Modelling.csv")</pre>

Handling Missing Data	<pre>[5]: dt.isnull().any()</pre> <p>Code for identifying and handling missing values.</p>
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Data Transformation	<pre>[42]: #training and testing the data 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) [43]: #Feature Scaling from sklearn.preprocessing import StandardScaler sc=StandardScaler() x_train=sc.fit_transform(x_train) x_test = sc.transform(x_test)</pre> <p>Code for transforming variables (scaling, normalization).</p>
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Feature Engineering	<pre>7]: #Removing columns data=dt.drop(['RowNumber', 'CustomerId', 'Surname'],axis=True)</pre> <p>Code for creating new features or modifying existing ones.</p>
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Save Processed Data

Code to save the cleaned and processed data for future use.

```
[23]: #LabelEncoding

[24]: from sklearn.preprocessing import LabelEncoder
      le=LabelEncoder()

[25]: #data["CreditScore"]=le.fit_transform(data["CreditScore"])
      data["Geography"]=le.fit_transform(data["Geography"])
      data["Gender"]=le.fit_transform(data["Gender"])
      #data["Age"]=le.fit_transform(data["Age"])
      #data["Tenure"]=le.fit_transform(data["Tenure"])
      #data["Balance"]=le.fit_transform(data["Balance"])
      #data["NumOfProducts"]=le.fit_transform(data["NumOfProducts"])
      #data["HasCrCard"]=le.fit_transform(data["HasCrCard"])
      #data["IsActiveMember"]=le.fit_transform(data["IsActiveMember"])
      #data["EstimatedSalary"]=le.fit_transform(data["EstimatedSalary"])
      #data["Exited"]=le.fit_transform(data["Exited"])
```