



Lloyds Banking Group Data Science Simulation

Predicting Customer Churn Using Machine Learning

Azizul Rahaman

About the Simulation



Hosted by Forage for Lloyds Banking Group



Simulated real-world data science project



Objective: Reduce customer churn using machine learning



Completed in two major tasks with real data files



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Why I Chose It



Explore how data science supports decision-making



Improve analytical communication skills

Task 1: My Work & Contributions

Worked as a data science graduate at Lloyds Banking Group for SmartBank's churn reduction project

Collected and merged data from multiple sources: demographics, transactions, service history, online activity, and churn status

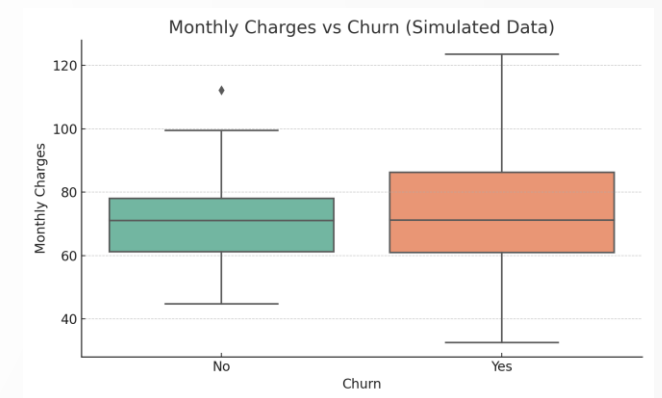
Performed exploratory data analysis (EDA) using Excel and Python to find customer behavior patterns

Created visual summaries to detect outliers and correlations

Calculated total customer spend, login frequency, and service interaction metrics

Cleaned the dataset:

- Replaced missing values with appropriate defaults (0 or "Unknown")
- Prepared numerical features for modeling (standardization-ready)



What I Learned from Task 1



Improved my skills in collecting and integrating real-world datasets



Learned how to explore large datasets and detect meaningful patterns



Gained practical experience in data cleaning and preprocessing techniques



Understood the link between poor service experience and customer churn



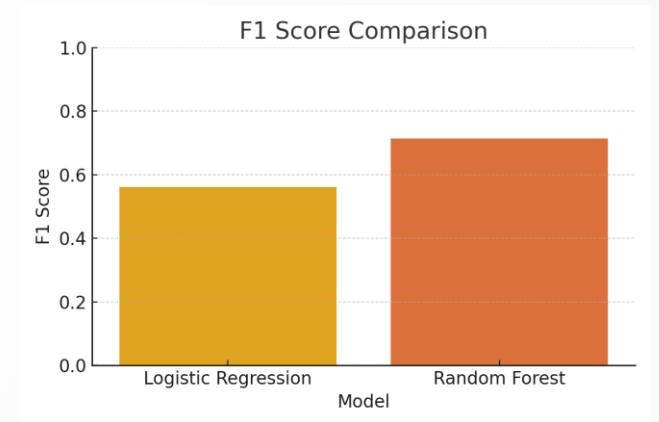
Recognized the importance of mobile app usage and engagement in retention



Prepared data effectively for machine learning model development in the next task

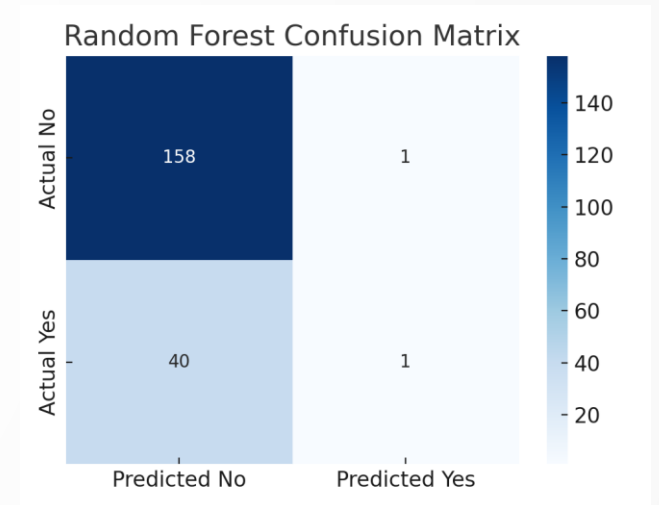
What I Did in Task 2 – My Role & Contributions

- Built predictive models to identify customers likely to churn for Lloyds Banking Group
- Used the cleaned dataset from Task 1 to train and evaluate models
- Selected and compared Logistic Regression and Random Forest algorithms
- Handled data imbalance using class weighting (`class_weight='balanced'`)
- Performed stratified train-test split to preserve class distribution
- Tuned hyperparameters and evaluated models using F1 Score, ROC-AUC, and confusion matrix
- Found Random Forest performed best (F1: 0.7132) and recommended it for deployment
- Suggested real-world use of model for targeted retention strategies (e.g., loyalty offers, communications)



What I Learned from Task 2

- Learned how to select models based on accuracy, interpretability, and business fit
- Understood the impact of class imbalance on model performance and how to address it
- Practiced evaluating models using multiple metrics, not just accuracy
- Strengthened skills in model validation using stratified sampling and performance tuning
- Gained experience in translating technical model results into business insights
- Learned the importance of model retraining and monitoring to ensure long-term effectiveness



My Role at SmartBank



Graduate Data Scientist at SmartBank,
part of Lloyds Banking Group



Simulated a junior analyst position in
digital banking



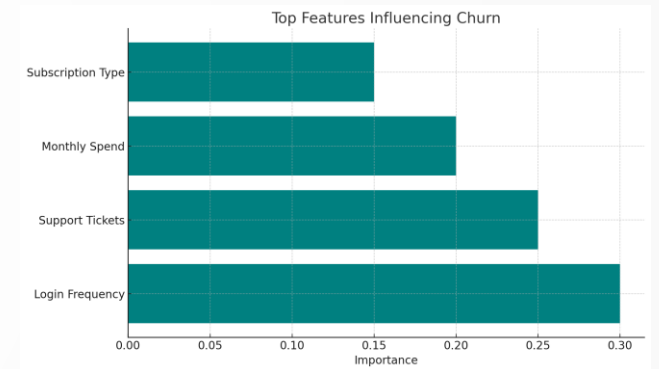
Explored customer behavior and
digital engagement



Used real data to mimic real-world
data science tasks

Technical Details – Scope

- Performed EDA on customer churn dataset
- Built ML model using Python & Excel



Technical Details – Workflow

STEPS: DATA
PREP →
MODELING →
EVALUATION

TOOLS:
CONFUSION
MATRIX, ROC-
AUC, F1 SCORE

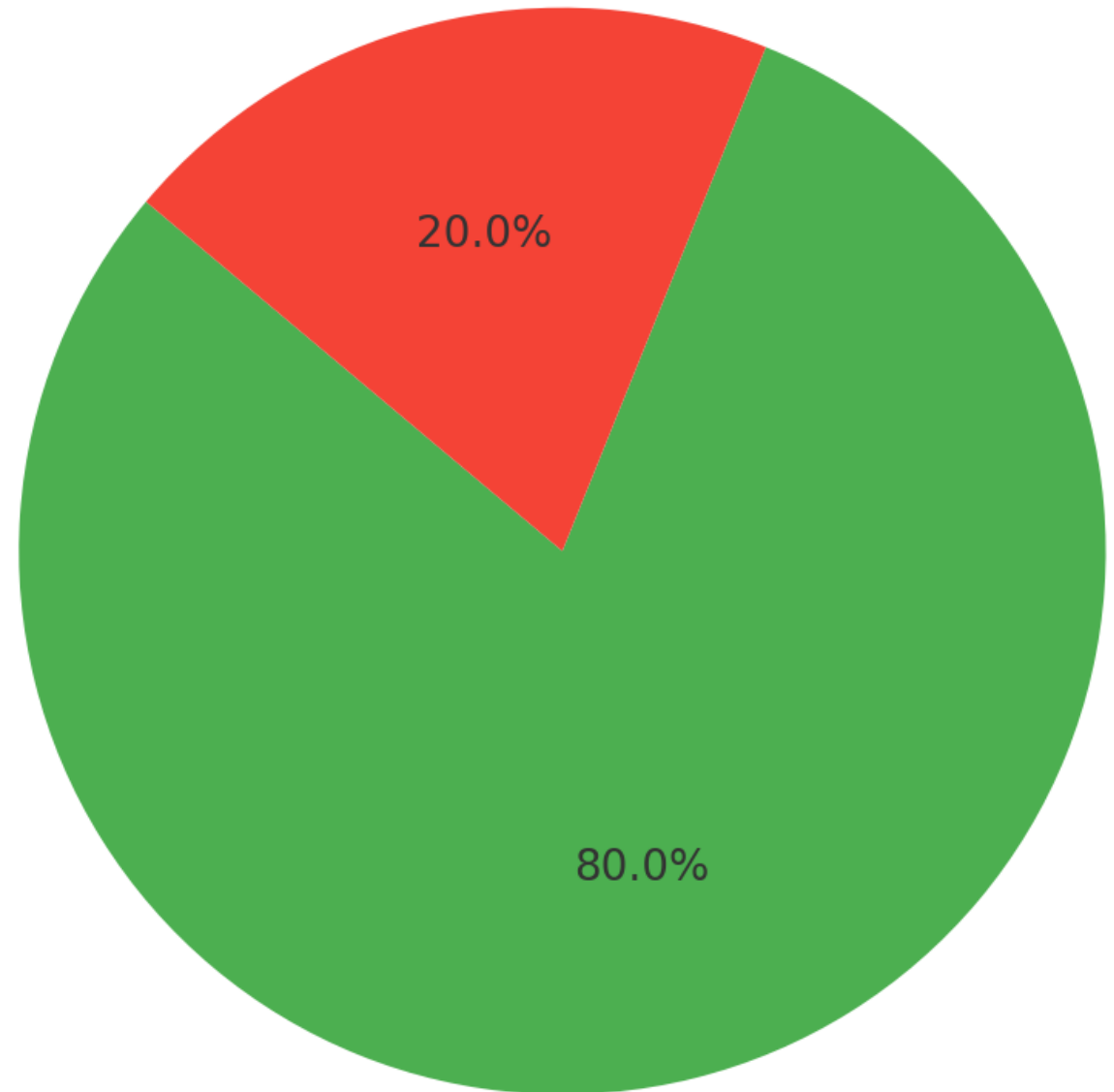


How My Work Helps the Business

- Predicted at-risk customers for SmartBank
- Enabled proactive customer retention actions

Customer Churn Distribution

Churned Customers



Retained Customers

Business Impact – Trends

- ▶ Banking uses predictive analytics
- ▶ Hybrid Data + InfoSec roles are growing





Thank You

Azizul Rahaman