

DEVELOPERS HUB CORPORATION - AI/ML INTERNSHIP REPORT

INTERNSHIP REPORT

Name: Ayesha Liaqat

Intern ID: DHC-1059

Department: AI / Machine Learning

Advanced task 1: Customer Churn Prediction

This document provides an overview of the tasks and learning outcomes from the AI/ML internship program at Developers Hub Corporation.

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Project Title: Customer Churn Prediction

Objective:

The project focused on building a predictive web application to identify customers likely to churn, using the Telco Customer Churn dataset and a logistic regression model deployed with Flask.

✓ Tasks Performed:

- Loaded and cleaned the **Telco churn dataset**
 - Handled missing/invalid values in TotalCharges column
 - Converted categorical variables using **Label Encoders**
 - Built and trained a **Logistic Regression model**
 - Saved model and encoders using **Pickle**
 - Created interactive **Flask app** for live predictions
 - Collected user inputs from an HTML form and predicted churn
 - Integrated **visualizations**: histograms, count plots, and heatmaps
 - Designed clear **user messages**: churn alert or stay confirmation
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📊 New Concepts Learned:

- Full-cycle **ML pipeline deployment with Flask**
 - Handling real-world data (mixed data types, empty strings, etc.)
 - Using **Pickle** to store models and encoders
 - Creating **interactive HTML forms** with Flask routing
 - Displaying **custom matplotlib/seaborn visualizations** in the browser
 - Deploying backend + frontend logic in one cohesive app
 - Decision logic based on churn prediction + probability scoring
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🔍 Visualizations Implemented:

- **Histograms** for numeric features like tenure, MonthlyCharges, and TotalCharges with mean and median lines
- **Count plots** for categorical features like gender and contract type
- **Heatmap** to show correlation between numeric variables

Conclusion:

This project helped reinforce concepts of:

- Machine learning model training and serialization
- Web development with Flask
- Exploratory Data Analysis and Visualization
- Real-time prediction workflows

It also demonstrated how data science models can be productized into real web apps for business use cases like customer retention.

Tech Stack:

- Python, Pandas, Scikit-learn
- Flask (backend), HTML/CSS (frontend)
- Seaborn, Matplotlib for plotting
- Pickle for model persistence
- Jinja templates for result rendering