# Internship Project Report

## 1. Introduction

The Credit Card Fraud Detection App was developed as part of the Elevate Internship Program (July 2025). With the rise in digital payments, detecting fraudulent transactions has become critical. This project aimed to build a machine learning-based system that predicts potential frauds and provides visual interpretability through SHAP (SHapley Additive exPlanations).

## 2. Abstract

This project focuses on identifying fraudulent transactions in credit card datasets using machine learning. The dataset used contains anonymized features of past transactions, with highly imbalanced labels. A model was trained using the XGBoost classifier and deployed via Streamlit. The web app allows users to upload CSV files and view fraud predictions along with interpretability plots. The app is publicly hosted for user interaction.

## 3. Tools Used

- Programming Language: Python 3.10
- Web Framework: Streamlit
- ML Library: XGBoost, Scikit-learn
- Data Handling: Pandas, NumPy
- Visualization: Matplotlib
- Model Explainability: SHAP
- Deployment: Streamlit Cloud

## 4. Steps Involved in Building the Project

1. Data preprocessing including scaling and cleaning
2. Building and training the XGBoost classification model
3. Saving the model using joblib
4. Creating a Streamlit web interface for uploading files and viewing predictions
5. Integrating SHAP to explain model outputs
6. Deploying the app to Streamlit Cloud
7. Writing documentation and finalizing the project repository

## 5. Deployment Details

The application was deployed using Streamlit Cloud.
- GitHub Repository: https://github.com/shreyasignatious/fraud-detection-app
- Live App Link: https://fraud-detection-app-named4btnexxrmgb8sa5xt.streamlit.app/
The model and Streamlit app were bundled in the repository with a clear file structure and a requirements.txt file. This ensured all necessary dependencies were installed during deployment.

## 6. Conclusion

This project helped apply machine learning skills in a practical scenario. The deployed web app successfully detects credit card frauds in uploaded datasets and explains its predictions, providing transparency. This project enhanced understanding of end-to-end ML pipelines and deploying interpretable models. It was a valuable hands-on learning experience.