Phase-1 Submission

Student Name: S.Nithyashree

Register Number: 410723104056

Institution: Dhanalakshmi college of

engineering

Department: CSE

Date of Submission: 30.04.2025

1.Problem Statements

Guarding transactions with AI-powered credit card fraud detection and prevention

2.Objectives of the Project

To develop a machine learning model capable of accurately detecting fraudulent credit card transactions.

To analyze transaction patterns and identify key indicators of fraud.

To create a real-time or near-real-time fraud detection system.

To visualize key insights for understanding fraud trends and model performance.

3.Scope of the Project

Features to be analyzed : *Transaction features such as amount, time, location, merchant, user behavior, etc. - Anomaly detection based on transaction patterns. - Real-time classification of transactions as fraudulent or genuine.*

4.Data Sources

- Dataset Name: Credit Card Fraud Detection - Source: Kaggle ([creadit card fraud detection](#))- Type: Public dataset - Nature: Static dataset with anonymized features representing transactions made by European cardholders in 2013.

5. High-Level Methodology

- ***Data Collection*** *–Data Collection: - Download the dataset from Kaggle. - Load it into the working environment (Google Colab / Jupyter Notebook)*

- ***Data Cleaning*** *–- Handle missing values if any (although the Kaggle dataset is already clean). - Remove duplicate entries if present. - Normalize/scale features where necessary.*

- ***Exploratory Data Analysis (EDA)*** *– Use visualizations (e.g., histograms, heatmaps, box plots) to explore class imbalance and feature distribution. - Analyze relationships between features and the fraud label.*

- ***Feature Engineering*** *–- Derive new features like transaction velocity or user behavior metrics. - Apply PCA or dimensionality reduction if needed.*

- ***Model Building*** *–- Derive new features like transaction velocity or user behavior metrics. - Apply PCA or dimensionality reduction if needed.*

- ***Model Evaluation*** *–- Derive new features like transaction velocity or user behavior metrics. - Apply PCA or dimensionality reduction if needed.*

- ***Visualization & Interpretation---*** *Visualize model results, feature importances, and fraud detection rates using matplotlib/seaborn/Plotly.*

- ***Deployment*** *– - Build a demo web app using Streamlit or Flask to simulate real-time fraud detection. - Allow user input for live model predictions.*

6. Tools and Technologies

- ***Programming Language*** *–Python*
- ***Notebook/IDE*** *–Google Colab, Jupyter Notebook*
- ***Libraries*** *–pandas, numpy, seaborn, matplotlib, plotly, scikit-learn, XGBoost, TensorFlow/Keras*
- ***Optional Tools for Deployment*** *– Streamlit, Flask, FastAPI*

7. Team Members and Roles

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1.	Nirosha.M	Exploratory Data Analysis
2.	Poorna kala.G	Data collection
3.	Nithyashree.S	Data Cleaning
4.	Yalini Nachiyar.S	Model Building & visualization

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