Phase-1 Submission

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Institution: Dhanalakshmi college of engineering

Department: CSE

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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

S NO	*TEAM MEMBERS*	*ROLES*
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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