Project 1: Credit Card Fraud Detection

Project Title: Credit Card Fraud

Problem Statement: The project aims to develop a machine learning-based system that analyses transaction data in real-time, effectively detecting credit card fraud while minimizing false positives. This solution will help financial institutions protect against fraudulent transactions, reducing financial losses and ensuring customer trust.

Phase 1: Problem Definition and Design Thinking

Problem Definition: The problem is to develop a machine learning-based system for real-time credit card fraud detection. The goal is to create a solution that can accurately identify fraudulent transactions while minimizing false positives. This project involves data pre-processing, feature engineering, model selection, training, and evaluation to create a robust fraud detection system.

Design Thinking:

1. Data Source: Utilize a dataset containing transaction data, including features such as transaction amount, timestamp, merchant information, and card details.
2. Data Pre-processing: Clean and pre-process the data, handle missing values, and normalize features.
3. Feature Engineering: Create additional features that could enhance fraud detection, such as transaction frequency and amount deviations
4. Model Selection: Choose suitable machine learning algorithms (e.g., Logistic Regression, Random Forest, Gradient Boosting) for fraud detection.
5. Model Training: Train the selected model using the pre-processed data.
6. Evaluation: Evaluate the model's performance using metrics like accuracy, precision, recall, F1-score, and ROC-AUC.