Credit Card Fraud Detection:

Problem Definition:

The objective of this project is to develop a robust credit card fraud detection system using data science and machine learning techniques to identify and prevent fraudulent transactions in real-time. Credit card fraud is a significant concern for financial institutions and customers, leading to financial losses and compromised security. Detecting fraudulent transactions is crucial to mitigate these risks. It helps to minimizing financial losses for both cardholders and the issuing bank while maintaining a seamless user experience.

Design Thinking:

Data Source: Utilize a dataset containing historical credit card transaction data and relevant factors such as transaction amount, timestamp, merchant information, and card details.

Data Pre-processing: Clean and prepare the data, handling missing values and scaling features if necessary and convert categorical features into numerical representations.

Feature Engineering: Extract relevant features from the transaction data, such as transaction amount, timestamp, and cardholder information.

Model Selection: Choose suitable machine learning algorithms like Logistic Regression, Random Forest, or Neural Network for fraud detection.

Model Training: Train the selected models using the labeled dataset.

Model Evaluation: Assess the model's performance using metrics like accuracy, precision, recall, F1-score and AUC-ROC and user satisfaction.

Cross-Validation: Ensure the model's robustness by using cross-validation techniques.

Model Deployment: Deploy the trained model in a real-time environment for automated fraud detection.

Security Measures: Implement security measures to protect the model from potential attacks and unauthorized access.