Second Project Report

## Project Title

Real-time Anomaly Detection in Financial Transactions

## Authors and Team

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## Executive Summary

### Decisions to be impacted

Based on our research, anomaly detection algorithms play a crucial role in shaping business decisions across three key areas:

* Personal Savings Protection: By identifying abnormal transactions, banks and other financial institutions can proactively monitor and block suspicious or high-risk activities, thereby safeguarding individual savings and account security.
* Risk Management: Anomaly detection enables financial institutions to recognize unusual patterns within portfolio management, allowing for timely adjustments to investment strategies, and ultimately enhancing risk management and financial performance.
* Anti-Money Laundering (AML): A major application of anomaly detection is in identifying irregular transaction behaviors that may indicate potential money laundering activities, helping institutions comply with regulations and prevent financial crime.

### Business Value

* Enhanced Security and Customer Trust
* Cost Reduction through Automated Monitoring
* Scalable Risk Management Solutions
* Proactive Fraud Prevention for Industry Growth

### Data Assets

* Transaction Data
* Historical Fraud Data
* Customer Behavioral Data
* External Economic Data

## Data Preprocessing

### Data Description

### Correlation with the target column

### Drop Nan and dominated features

### Filling Nan

#### Correlation heatmap of Features with entire values

#### Simply filling

#### KNN filling

### Outlier detections

#### IQR detection

#### Z-score detection

#### DBScan/ Isolation

## Model Updates

### Models in Planning

### Machine Learning WorkFLow as MLM

## Source Code

// when finished the code, paste the github link.

## Next Steps

### Plan for Improvement

### Timeline of Next Steps