

Data Base Management System

Project Proposal: Fraud Detection in Banking Transactions

Problem Statement

With more people using online banking and electronic payments, fraud in financial transactions has become a big problem. Fraud can take many forms, like unauthorized access to accounts, huge transactions, or multiple transactions in a very short time. Banks need better ways to quickly and accurately spot these suspicious activities to protect their customers and reduce financial losses.

Proposed Solution

The goal of this project is to create an SQL-based system to detect fraudulent transactions in banking. The system will analyze transaction data and flag anything that looks unusual. By identifying things like unusually large amounts, unexpected locations, or a high number of transactions in a short time, the system will help banks take action to prevent fraud.

Key Features of the Solution

1. **Spotting Unusual Transactions:**
 - Find transactions that exceed a certain limit (like a very large amount).
 - Detect a lot of transactions happening in a short time from the same account.
2. **Checking Locations:**
 - Flag transactions from locations that don't match the user's normal activity.
3. **Device and IP Tracking:**
 - Identify transactions made from unknown or suspicious devices or IP addresses.
4. **User Profiles:**
 - Keep track of each user's normal behavior to make it easier to spot unusual activity.
5. **Reports and Alerts:**
 - Generate simple reports showing flagged transactions and patterns.

Data Collection and Storage

- **Data Collected:**
 - User details, transaction IDs, timestamps, amounts, locations, and device/IP information.
 - Flagged transactions with reasons for anomaly detection.

- **Data Storage:**
 - Organized in relational tables: Users, Transactions, Flags, and Thresholds.
 - Optimized for quick data access and analysis.

Data Access and Usage

- **Access:** Restricted to authorized users (e.g., administrators).
- **Usage:** Identify patterns, flag anomalies, and generate detailed fraud reports.

Deliverables

1. A structured relational database for storing and managing transaction data.
2. SQL queries for fraud detection.
3. Reports summarizing flagged transactions.
4. Documentation detailing the system's implementation and workflows.

Expected Outcomes

- **Fraud Detection System:** A functional SQL-based system to analyze transaction data and flag potential fraud effectively.
- **Actionable Insights:** Reports highlighting suspicious activities for immediate action.
- **Enhanced Security:** Demonstrates the role of data-driven techniques in strengthening banking security.
- **Skill Development:** Showcases SQL and database management expertise, making the project resume-worthy.
- **Scalability:** Design adaptable for real-time monitoring or integration with advanced technologies.

Future Scope

- **Real-Time Monitoring:** Expand the system for instant fraud alerts.
- **Machine Learning Integration:** Improve detection accuracy using advanced algorithms.
- **Risk Scoring:** Prioritize critical cases with a transaction scoring system.
- **Broader Use Cases:** Adapt the system for other industries like e-commerce or insurance.