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Assignment No - 1

Use Case: Fraud Detection in Banking

1. Data:

In the banking sector, fraud detection is a critical application of machine learning and data analytics. The dataset used for fraud detection primarily consists of transactional records of customers, containing attributes such as transaction amount, location, time, and payment method.

Data Sources:

- Banking transaction databases
- Customer financial records
- Credit card transaction logs
- External fraud reporting agencies
- Online payment platforms (e.g., PayPal, Stripe)

Data Issues:

- **Imbalanced Data:** Fraud cases are rare compared to legitimate transactions, leading to a class imbalance.
- **Missing Data:** Some transactions might have incomplete records, such as missing location or merchant information.
- **Noisy Data:** Transactions may have errors due to incorrect manual entry or system glitches.
- **Data Privacy and Security:** Financial data is highly sensitive, requiring compliance with regulations like GDPR and PCI DSS.

Types of Data:

1. **Structured Data:** Transaction details, account numbers, timestamps, and transaction amounts.
2. **Unstructured Data:** Customer support logs, fraud complaints, and text-based transaction descriptions.
3. **Time-Series Data:** Transaction trends over time to identify abnormal spending behaviors.

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2. Problem Statement:

Fraudulent transactions cause significant financial losses to banks and their customers. The primary challenge is to develop a fraud detection system that can accurately classify transactions as either

genuine or fraudulent in real time. The objective is to minimize false positives (incorrectly flagged genuine transactions) while maximizing fraud detection accuracy.

A well-designed fraud detection system should incorporate:

- Real-time anomaly detection
- Machine learning algorithms to learn fraudulent transaction patterns
- Integration with customer alerts and authentication mechanisms
- Adaptability to evolving fraud techniques

Conclusion: With the increasing volume of digital transactions, fraud detection is essential to safeguard banking operations. Advanced analytics, AI-driven models, and robust data handling techniques play a crucial role in detecting and preventing fraudulent activities.

THANKYOU