## Summary – Fraud Detection Project

### Project Title:

**Fraud Detection & Pattern Analysis in Bank Transactions**

### Business Problem:

The bank faced increasing fraudulent transactions, with no effective visibility into when or where these occur. Manual review overwhelmed the fraud team, and most alerts were false positives. The business needed data-driven insights to proactively detect suspicious activity and improve operational efficiency.

### Objectives:

| **Goal** | **Outcome** |
| --- | --- |
| Identify high-risk transactions | SQL & Excel logic for fraud scoring |
| Analyze fraud behavior by time & amount | Hourly and amount-based risk trends |
| Reduce alert fatigue | Prioritized high-risk transactions |
| Build a dashboard | Power BI with fraud KPIs and slicers |
| Document everything as a BA | BRD, stakeholder map, AS-IS / TO-BE, user stories |

### Tools Used:

| **Tool** | **Purpose** |
| --- | --- |
| **Excel** | Cleaning and enrichment (Hour, Amount Bucket) |
| **SQL Server** | Fraud segmentation queries |
| **Power BI** | Dashboard and fraud pattern visuals |
| **Lucidchart / Draw.io** | Process maps (AS-IS / TO-BE) |
| **Word** | BRD, Stakeholder Analysis |

### Key Insights:

| **Insight** | **Why it Matters** |
| --- | --- |
| Most frauds occur in early morning hours (2 & 11 AM) | Indicates potential bot or scripted attacks |
| High-value transactions (> ₹1000) had 3× higher fraud rate | Suggests need for limits and additional checks |
| Overall fraud rate is 0.17% | Though rare, losses are significant |
| 90%+ of flagged transactions were false positives in current model | Creates inefficiency for Fraud Ops team |

### Recommendations:

Enable dynamic transaction scoring by time, amount, and device

Block high-value transactions from new IPs at high-risk hours

Add machine learning models in the future for pattern detection

Automate alerts and build real-time dashboards

### Deliverables:

| **File** | **Description** |
| --- | --- |
| Fraud\_BRD.docx | Business Requirements Document |
| Fraud\_Stakeholder\_Matrix.xlsx | Roles, interest, communication strategy |
| Process\_Map\_ASIS\_TOBE.png | Visual of current vs improved detection |
| Fraud\_SQL\_Queries.sql | Complete query log |
| Fraud\_Analysis\_Cleaned.xlsx | Data cleaning, derived columns |
| Fraud\_Dashboard.pbix | Interactive Power BI report |
| Project\_Summary\_Fraud.pdf | This document summary |

### Interview Summary (How to Explain)

"I conducted a fraud pattern analysis project using anonymized banking data. I cleaned the data in Excel, wrote SQL queries to identify peak fraud hours and high-risk transaction types, and built a Power BI dashboard showing real-time alerts and fraud KPIs. I also documented the project from a business analyst's perspective including BRD, stakeholder mapping, and process redesign."