BANK DEBIT AND CREDIT ANALYTICS PROJECT

COMPARATIVE ANALYSIS USING

Excel

Power BI

Tableau

SQL

Presented By Group 3

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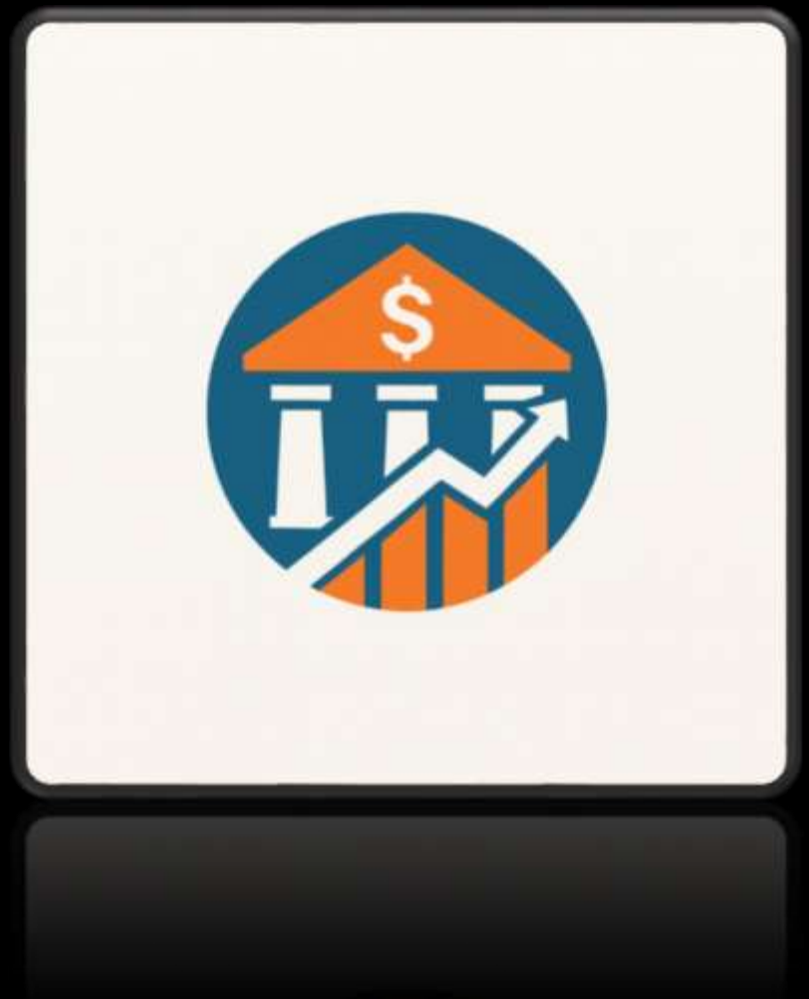


INTRODUCTION

- The **Bank Debit & Credit Analytics Project** is an end-to-end data analytics initiative that analyzes banking transaction data to understand financial movement, customer behavior, and operational performance across branches and transaction channels.

- The project uses **SQL** for data extraction and KPI calculations, **Excel** for data cleaning and preliminary analysis, and **Power BI** and **Tableau** for creating interactive dashboards and visualizing key insights related to deposits, withdrawals, balances, and transaction trends.

- The dashboards enable stakeholders to compare debit and credit patterns, evaluate net transaction flow, monitor transaction volumes, and identify potential high-risk activities, supporting data-driven decision-making and effective risk management.

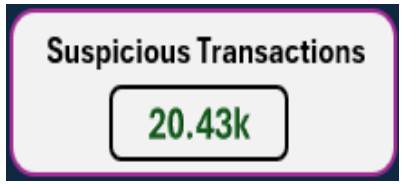
WHY THIS PROJECT

- To understand how money moves in and out of bank accounts through debit and credit transactions.
- To compare total credit and debit amounts and check overall transaction balance.
- To identify transaction patterns across banks and branches.
- To monitor customer transaction activity and payment method usage.
- To detect suspicious and high-risk transactions for fraud monitoring.
- To support better operational control and data-driven banking decisions.

KPI’S

Total Customers: 100,000	Represents a large and diverse customer base
Total Credit Amount: 127.60 Million	Indicates strong inflow of funds
Total Debit Amount: 127.29 Million	Shows comparable spending/outflow behavior
Credit to Debit Ratio: 1.002:1	Reflects a balanced financial transaction pattern
Net Transaction Amount: 318.12K	Slight positive net inflow overall
Branch Transaction Amount	All branches perform consistently (41M –43M range)
Transaction Method Volume	• Debit Card: 85.16M (33.41%) • Credit Card: 84.93M (33.32%) • Bank Transfer: 84.80M (33.27%)
Suspicious Transaction Frequency	• Highest: Kotak Mahindra Bank (17.5%) • Lowest: State Bank of India (16.4%)

PERFORMANCE ANALYSIS

			
Total credit (**₹127.60M**) and total debit (**₹127.29M**) are almost equal, showing stable transaction activity.	Net transaction amount is very small, which means money flows in and out regularly without accumulation.	Indicates a high number of customers using the bank	A noticeable number of suspicious transactions highlights the need for stronger monitoring and fraud control.

EXCEL DASHBOARD

Bank Debit and Credit Dashboard

Presented By: Group 3

Total Credit Amount	Total Debit Amount	Credit to debit ratio	Net Transaction Amount	Suspicious Transactions	Total Customers
127.60M	127.29M	1.002 : 1	318.12k	20.43k	100.00k

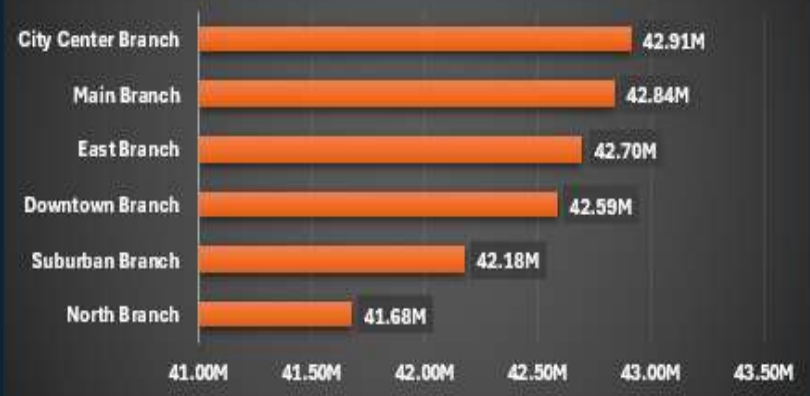
Transaction Method
- Bank Transfer
- Credit Card
- Debit Card

High-Risk / Normal Txn
- High-Risk
- Normal

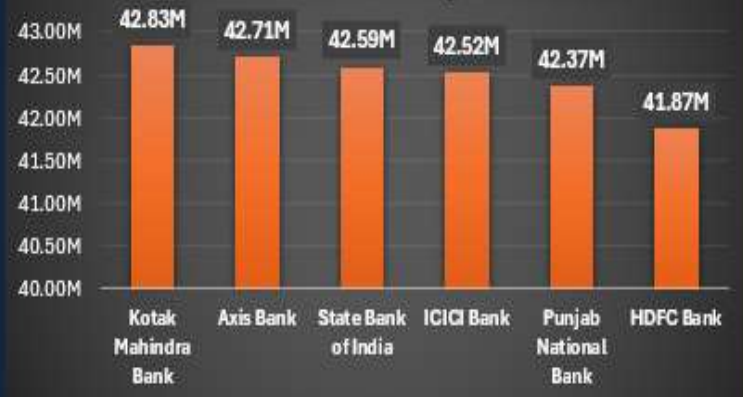
Transaction Date
2024 MONTHS
2024
JAN FEB MAR APR MAY JUN

Bank Name
- Axis Bank
- HDFC Bank
- ICICI Bank
- Kotak Mahindra Bank
- Punjab National Bank
- State Bank of India

Transaction Amount by Branch

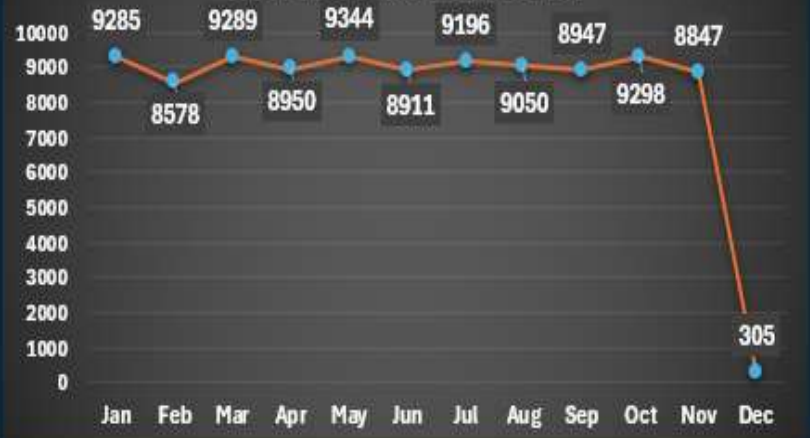


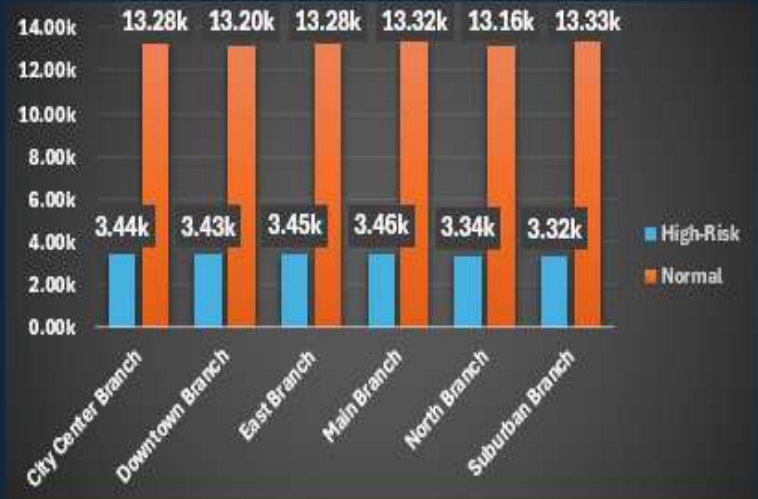
Transaction Volume by Bank Name



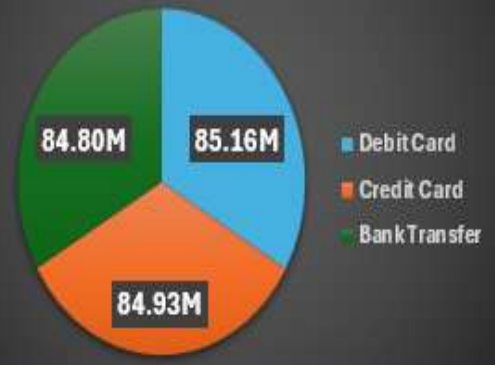
Total Credit & Debit Amount

Transactions Per Month





Transaction Method Distribution



POWER BI DASHBOARD - 1

Debit & Credit Dashboard

100K	127.60M	127.29M
Total Customers	Total Credit Amount	Total Debit Amount

Date: All

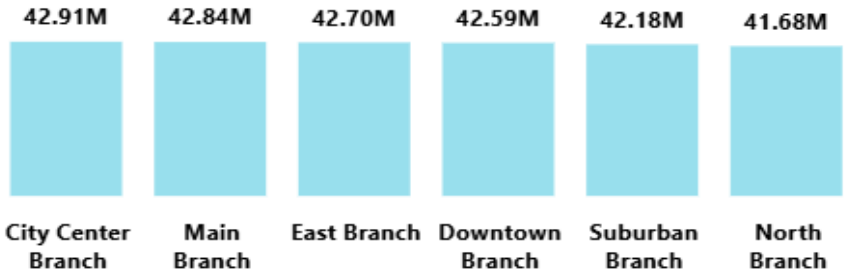
1.00	19.01	318.12K
Credit To Debit Ratio	Account Activity Ratio	Net Transaction Amount

Bank Transfer | Credit Card | Debit Card

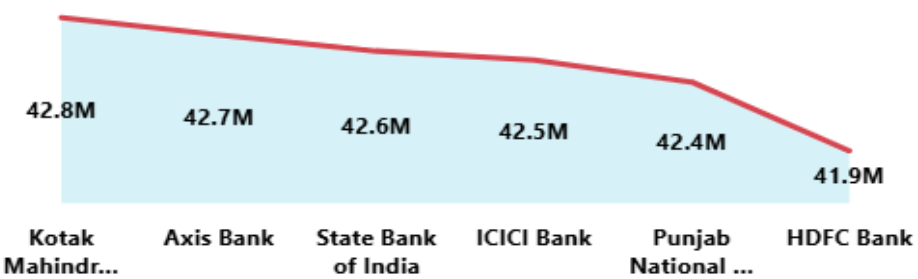
Credit

Debit

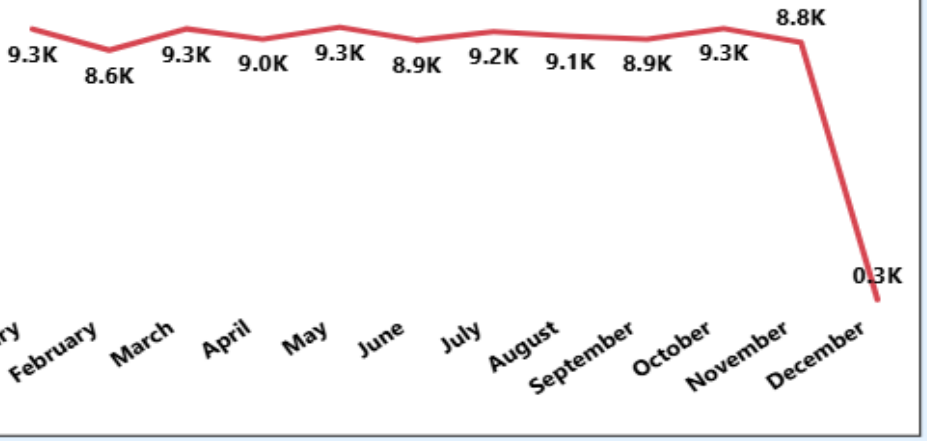
Transaction Amount By Branch



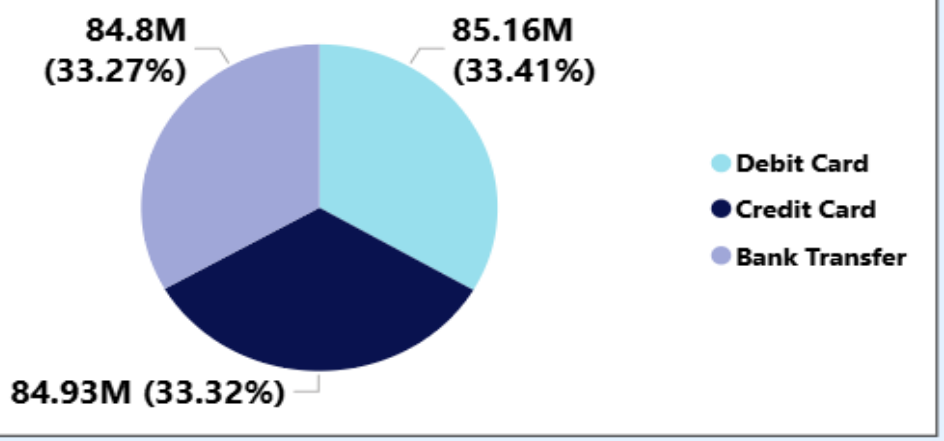
Transaction Amount By Bank



Transactions Per Month



Transaction Method Volume



Branch

- [ ] City Center Branch
- [ ] Downtown Branch
- [ ] East Branch
- [ ] Main Branch
- [ ] North Branch
- [ ] Suburban Branch

Bank Name

- [ ] Axis Bank
- [ ] HDFC Bank
- [ ] ICICI Bank
- [ ] Kotak Mahindra Bank
- [ ] Punjab National Bank
- [ ] State Bank of India

POWER BI DASHBOARD - 2

Debit & Credit Dashboard

100K	127.60M	127.29M
Total Customers	Total Credit Amount	Total Debit Amount

Date: All

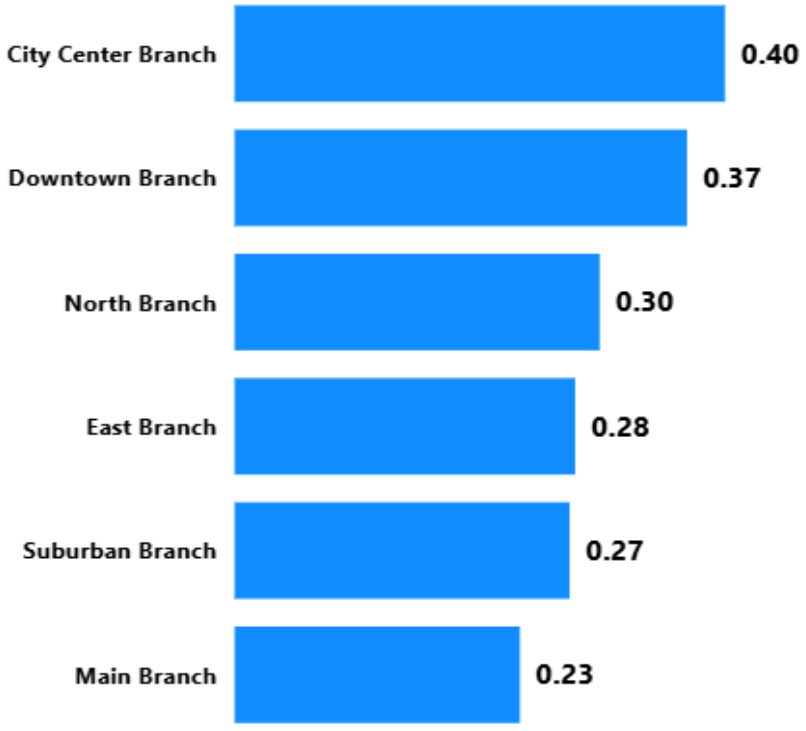
1.00	19.01	318.12K
Credit To Debit Ratio	Account Activity Ratio	Net Transaction Amount

Bank Transfer | Credit Card | Debit Card

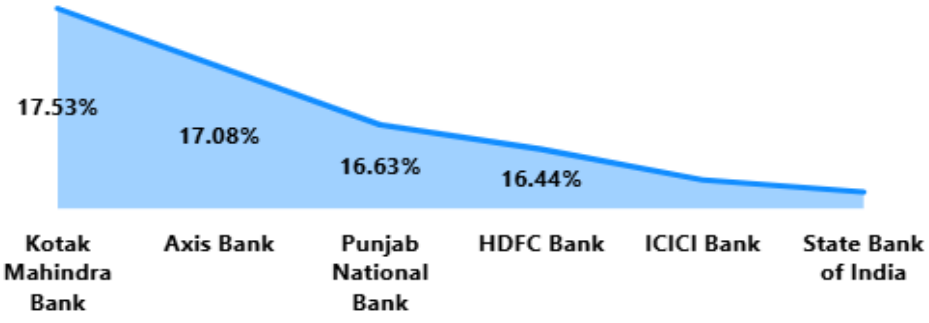
Credit

Debit

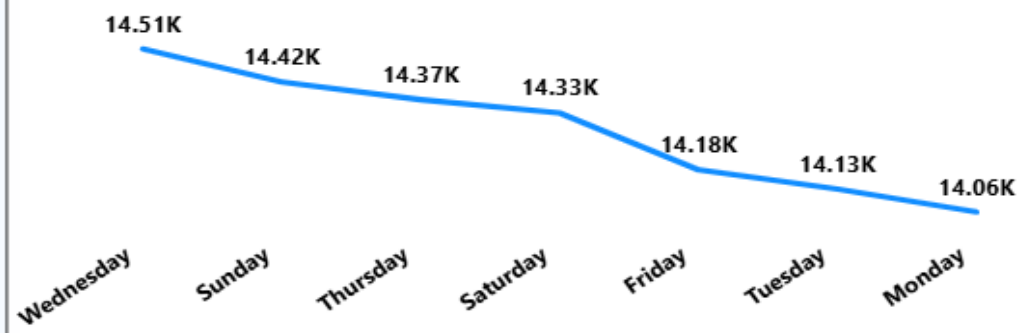
Transaction Growth% By Branch



Suspicious Transaction Frequency By Bank



No. Of Transactions in a Week



Branch

- City Center Branch
- Downtown Branch
- East Branch
- Main Branch
- North Branch
- Suburban Branch

Bank Name

- Axis Bank
- HDFC Bank
- ICICI Bank
- Kotak Mahindra Bank
- Punjab National Bank
- State Bank of India

TABLEAU DASHBOARD

Bank Debit and Credit Dashboard

Credit 127.60M

Debit 127.29M

Net transaction amount 318.12K

Month of Transact..
- (All)
- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

Bank Name
- (All)
- Axis Bank
- HDFC Bank
- ICICI Bank
- Kotak Mahin...
- Punjab Natio...
- State Bank of...

Branch
- (All)
- City Center B...
- Downtown B...
- East Branch
- Main Branch
- North Branch
- Suburban Br...

Branch transaction growth

Month of Tr..	
January	
February	-7.61%
March	8.29%
April	-3.65%
May	4.40%
June	-4.63%
July	3.20%
August	-1.59%
September	-1.14%
October	3.92%
November	-4.85%
December	-96.55%

High risk transaction flag

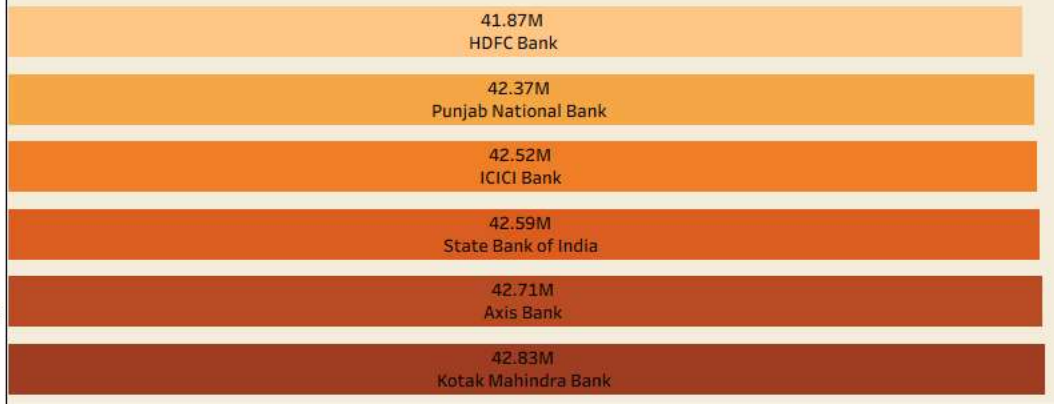
Transactio..	High ..
Bank Transfer	6,726
Credit Card	6,844
Debit Card	6,856

Suspicious Transaction Frequency

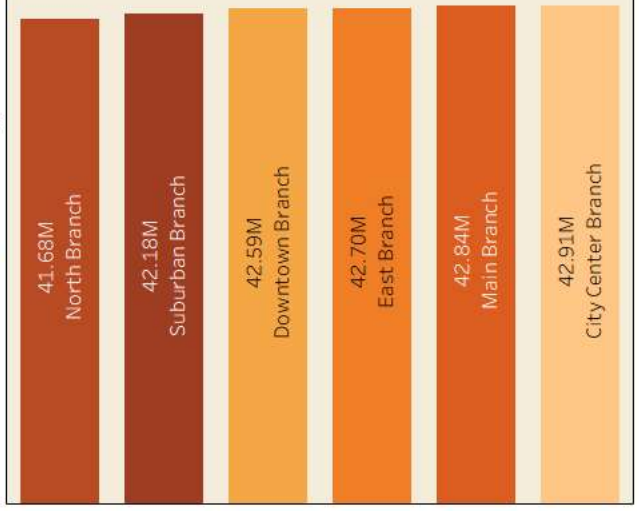
Account activity ratio

Credit to Debit ratio

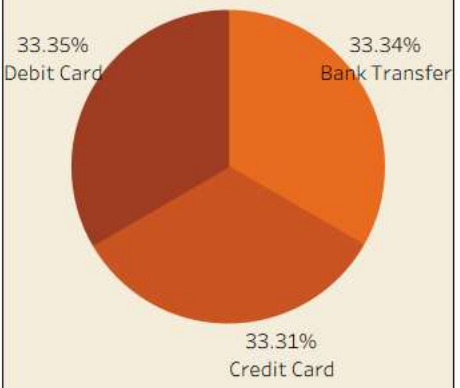
Transaction volume by bank



Total transaction amount by branch



Transaction method distribution



SQL QUERIES

```sql
Create Database DebitCredit;
Use DebitCredit;
Select * from `debit and credit banking_data`;
-- 1. Total Credit Amount
Select sum(Amount)  from `debit and credit banking_data` where `Transaction Type` = "Credit";

-- 2. Total Debit Amount
Select sum(Amount)  from `debit and credit banking_data` where `Transaction Type` = "Debit";

-- 3. Credit to debit Ratio
SELECT
    CAST(SUM(CASE WHEN `Transaction Type` = 'Credit' THEN Amount ELSE 0 END) AS REAL) /
    SUM(CASE WHEN `Transaction Type` = 'Debit' THEN Amount ELSE 0 END) AS credit_to_debit_ratio
FROM
    `Debit and Credit banking_data`;

    -- 4. Net Transaction Amount
SELECT
    CAST(SUM(CASE WHEN `Transaction Type` = 'Credit' THEN Amount ELSE 0 END) AS REAL) -
    SUM(CASE WHEN `Transaction Type` = 'Debit' THEN Amount ELSE 0 END) AS credit_to_debit_ratio
FROM
    `Debit and Credit banking_data`;
```

SQL QUERIES

```sql
-- 5. Account Activity Ratio
select `Account Number`,count(`Transaction Date`)
from `debit and credit banking_data` group by `Account Number`;

select `Account Number`,`Balance`, 1/`Balance` as Account_Activity_Ratio
from  `debit and credit banking_data`;

-- 6. Transactions Per Day/Week/Month
-- Transactions per Day
Select day(`Transaction Date`) as Day, count(`Customer Id`) as No_of_Transactions
from `debit and credit banking_data`group by day(`Transaction Date`) order by day(`Transaction Date`);

-- Transactions Per Week
Select weekofyear(`Transaction Date`) as Week, count(`Customer Id`) as No_of_Transactions
from `debit and credit banking_data`group by weekofyear(`Transaction Date`) order by weekofyear(`Transaction Date`);

-- Transactions Per Month
Select month(`Transaction Date`) as Month,
count(`Customer Id`) as No_of_Transactions
from `debit and credit banking_data`group by Month(`Transaction Date`)
order by Month(`Transaction Date`);
```

SQL QUERIES

```sql
-- 7. Total Transaction Amount By Branch
Select Branch, sum(Amount) from `debit and credit banking_data`
group by Branch order by sum(Amount) desc;

-- 8. Transaction Volume By Bank
select `Bank Name`, sum(Amount) from  `debit and credit banking_data`
group by `Bank Name` order by sum(Amount) desc;

-- 9. Transaction Method Distribution
select `Transaction Method`, count(`Transaction Method`) from `debit and credit banking_data`
group by `Transaction Method` order by count(`Transaction Method`) desc;
```

KEY INSIGHTS

Transaction Value Balance

Total credit stands at **₹127.60M** while total debit is **₹127.29M**, resulting in a **credit-to-debit ratio of 1.002:1**.
This reflects a highly stable transaction flow with minimal liquidity imbalance.

Suspicious Transaction Exposure

A total of **20.43K suspicious transactions** accounting for **about 34%** of all transactions While normal transactions dominate, This level is significantly high and requires stronger fraud detection controls.

Branch Transaction Leadership

The City Center Branch records the highest transaction value at **₹42.9M**. However, the small difference across branches indicates marginal leadership rather than strong dominance.

Monthly Transaction Pattern

Monthly transactions remain stable from January to November at around **8,500 to 9,300 transactions**. The sharp drop in December to **305 transactions** likely indicates incomplete data rather than reduced activity.

Transaction Method Preference

Debit cards contribute the highest transaction value at **₹85.16M**, followed closely by credit cards at **₹84.93M** and bank transfers at **₹84.80M**. Customer usage is evenly distributed across payment methods.

Transaction Volume vs Value Gap

Although transaction values are high, the net transaction amount remains very small. This indicates that customers are actively transacting, but **funds are circulating rather than accumulating.**

Customer Base Size

The bank serves **100,000 customers**, generating very high transaction volumes. Even small inefficiencies or risks at this scale can have large financial and operational impacts.

Net Transaction Position

The net transaction amount is **₹318.12K**, which is **less than 0.3%** of total transaction volume. This confirms a near-neutral cash position rather than a meaningful surplus.

STRATEGIC RECOMMENDATIONS

Use One Central Fraud System

Since suspicious transactions happen across all branches and banks, fraud monitoring should be **handled centrally instead of separately by each branch.**

Learn From the Best Branch

City Center Branch has the highest transaction value. Other branches can learn and **apply its working methods.**

Keep Existing Customers Active

Money moves a lot but does not stay long in accounts. Focus on **keeping customers engaged** so balances remain higher.

Encourage Higher-Value Transactions

Motivate customers to **make fewer but higher-value transactions** to improve efficiency.

Follow the Same Process in All Branches

All branches perform similarly, so **using the same working process everywhere** will improve consistency.

Strengthen Online Transaction Safety

Since customers use multiple transaction methods equally, **improving digital security** will reduce risk without affecting usage.

Automate Fraud Checking

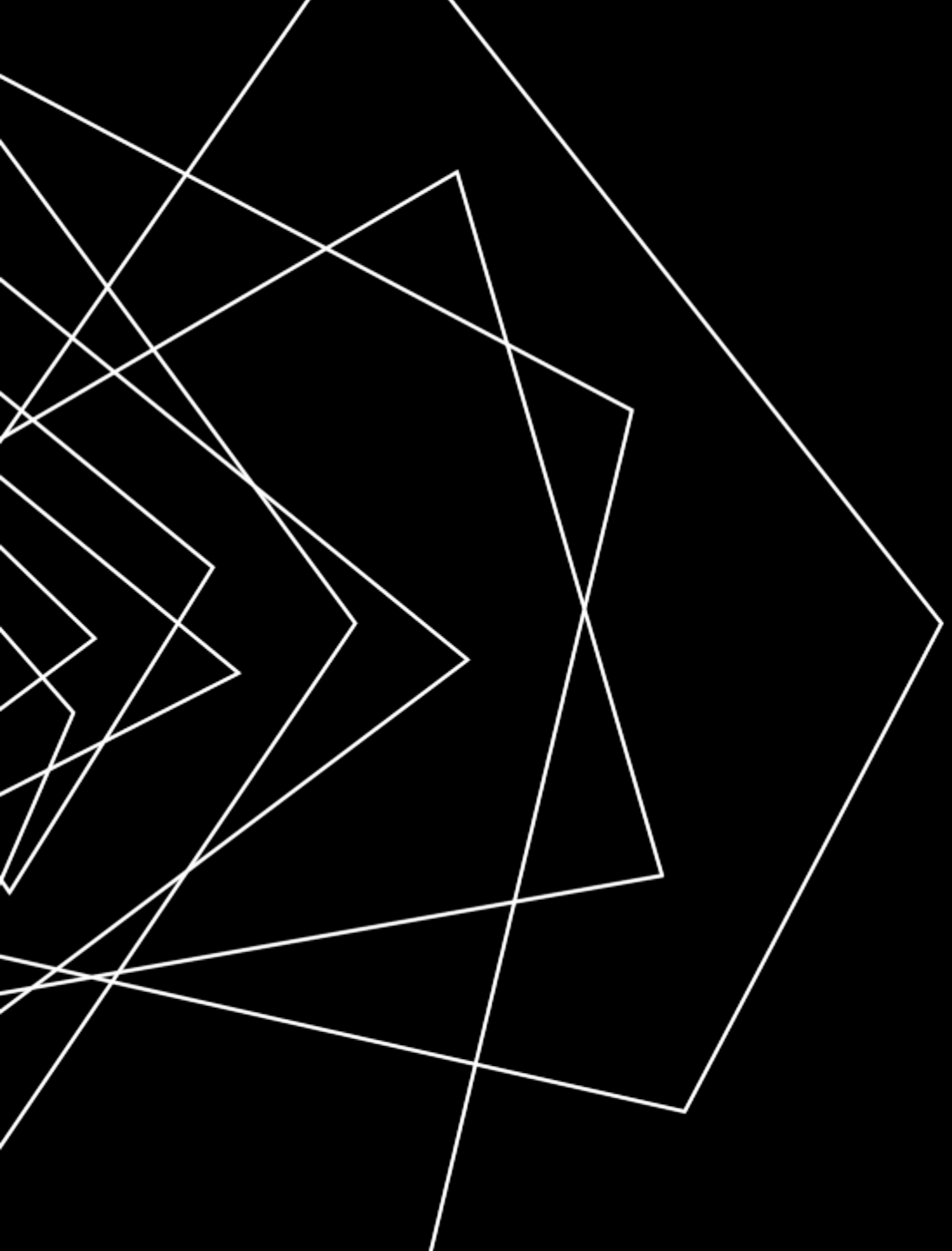
Manually reviewing many suspicious transactions takes time. **Automation can make this faster and more accurate.**

Track High-Activity Banks and Branches

Branches and banks with higher transaction values should be closely monitored to **ensure growth is healthy and safe.**

CONCLUSION

This project analyzed bank debit and credit transactions to understand money flow, customer behavior, and transaction patterns. The analysis shows balanced credit and debit activity across banks and branches, indicating stable operations. Transaction trends remain consistent over time, with a drop in December due to incomplete data. However, the high number of suspicious transactions highlights the need for stronger fraud monitoring to support better decision-making and risk control.



THANK YOU