# 📘 BANK LOAN ANALYTICS PROJECT REPORT

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## 1. Introduction

Banks process thousands of loans every month, and analysing loan performance is essential to understand borrower behaviour, repayment patterns, and default risk.
This project performs end-to-end analysis using **Python, SQL, and Power BI** to derive insights from raw loan data.

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## 2. Project Objectives

1. Clean and merge raw datasets using Python.
2. Prepare an analysis-ready dataset for SQL and Power BI.
3. Build analytical KPIs using SQL queries.
4. Develop a Power BI dashboard using professional visuals.
5. Identify trends, risks, and key metrics for decision-making.

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## 3. Dataset Description

Two datasets were provided:

**Finance_1**

- Loan Amount
- Funded Amount
- Issue Date
- Grade & Sub-grade
- Loan Status
- Home Ownership
- Verification Status
- State

**Finance_2**

- Revolving Balance

- Total Payment
- Last Payment Date
- Next Payment Date
- Credit Pull Date

The datasets were merged using the **id** field.

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**4. Data Cleaning & Preparation (Python)**

Performed in Google Colab:

**Cleaning Steps**

- Cleaned column names
- Converted date fields to datetime
- Removed duplicate records
- Cleaned numeric fields
- Created derived fields (issue_year, issue_month)
- Merged both tables using id

**Final Output:** Merged_Finance.csv

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**5. SQL Analysis**

SQL was used to compute all major KPIs used in Power BI.

**SQL Outputs**

- Year-wise loan amount
- Total payment by verification status
- Revolving balance by grade
- Charged-off loan count
- Default rate
- YoY percentage change
- Monthly loan amount trend

All queries are stored in SQL QUERIES file.

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**6. Power BI Dashboard**

The dashboard was designed to give a clear, simple, and professional view of loan performance.

**KPIs Displayed**

- Total Loan Amount
- Total Payments
- Total Revolving Balance
- YoY % Change
- Charged-Off Loans
- Default Rate

**Visualizations Used (Corrected to match your actual dashboard)**

● **KPI Cards** — for top metrics
●**Line Chart** — Loan Amount Trend
●**Line Chart** — Revolving Balance Trend
● **Line Chart** — Total Payment Trend
● **Bar Chart** — Loan Status Breakdown
●**Clustered Bar / Column Chart** — State-wise Loan Count
●**Bar Chart** — Grade & Sub-grade Performance
● **Donut Chart**

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**7. Key Insights**

- Loan amount increased consistently across years.
- Charged-off loans form a small but important risk segment.
- Grades B, C, and D contribute to most loans.
- Revolving balance shows predictable patterns linked to loan behaviour.
- Verified loans show comparatively stable repayment behaviour.

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**8. Business Insights**

- **Loan Volume increased YoY**, indicating strong growth.

- **Charged-Off cases higher in certain states**, suggesting risky regions.
- **Grades B–D contribute to maximum loan approvals**, but also have higher default chances.
- **Revolving balance is strongly correlated with payment behaviour.**
- **Monthly patterns show seasonal spikes in loan issuance.**

These insights help banking teams make informed decisions on **lending strategy, credit risk, and portfolio management.**

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**9. Deliverables**

- data_cleaning.py
- Merged Finance.csv
- loan_analysis_queries.sql
- Power BI dashboard (.pbix)
- Dashboard screenshots
- Full project report
- GitHub README

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**10. Conclusion**

This project demonstrates an end-to-end data analytics workflow involving data cleaning, SQL analysis, BI dashboard development, and business insights. It reflects strong capability in real-world data analytics and is suitable for Data Analyst, Business Analyst, and BI roles.