Bank Loan Analysis Project

Defining the Challenge: Problem Statement

Ourobjective was to leverage robust data analysis to transform raw bank loan data into actionable insights, thereby empowering strategic lending decisions.This involved several key components:

Clear Goals & Objectives

Establish precise goals for understanding loan performance and borrower behaviour.

Key Performance Indicators (KPIs)

Identify and define critical metrics for assessing loan health and operational efficiency.

Good vs. Bad Loan Segmentation

Develop a robust methodology for classifying loans to facilitate risk assessment.

Dashboard Expectations

Design intuitive, interactive dashboards for diverse stakeholders, from analysts to executives.

Project Overview: A Comprehensive Approach

This project aimed to provide a holistic view of bank loan data through a structured analytica lworkflow, combining data extraction, cleansing, analysis, andvisualisation.

Purpose

To enhance loan monitoring, risk assessment, and strategic decision-making within the banking sector.

Tools Utilised

Leveraging Python for data manipulation, SQL for structured query and extraction, and Power BI for interactive dashboards.

DataSources

Analysis was performed on comprehensive financial loan datasets.

Workflow

A sequential process from raw data acquisition to final dashboard deployment.

The Analytical Toolkit: Tech Stack & Data Sources

Python & Pandas

For advanced data cleaning, transformation, and exploratory data analysis.

SQL Server

Used for efficient data storage, management, and complex query execution.

Power BI

The primary tool for interactive dashboard development and data visualisation.

Jupyter Notebook

For iterative Python code development and documentation of analytical steps.

Data Sources

- `financial_loan.csv`: Primary dataset for loan details.
- `financial_loan.xlsx`: Supplemental data providing additional financial contexts.

Data in Action: SQL Queries & Python Analysis

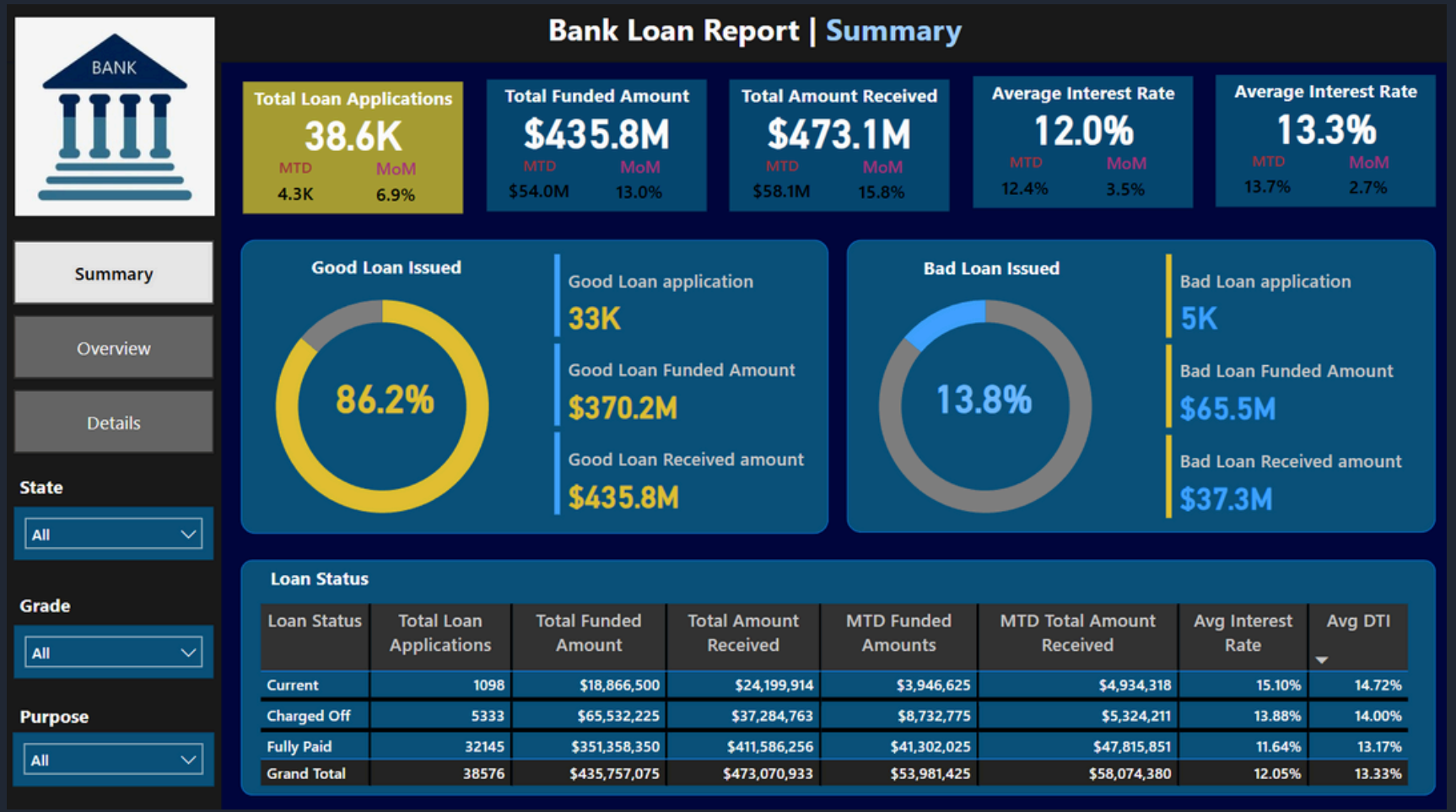
SQL-Based Metric Extraction

- Total Loan Applications: Counting all submitted requests.
- Funded Amounts: Aggregating capital disbursed to borrowers.
- Payments Received: Tracking all repayment inflows.
- Average Interest Rate: Calculating the mean cost of borrowing.
- Average Debt-to-Income (DTI): Assessing borrower financial health.
- Good vs. Bad Loan Metrics: Categorising loans for risk management.

Python-Based Analysis

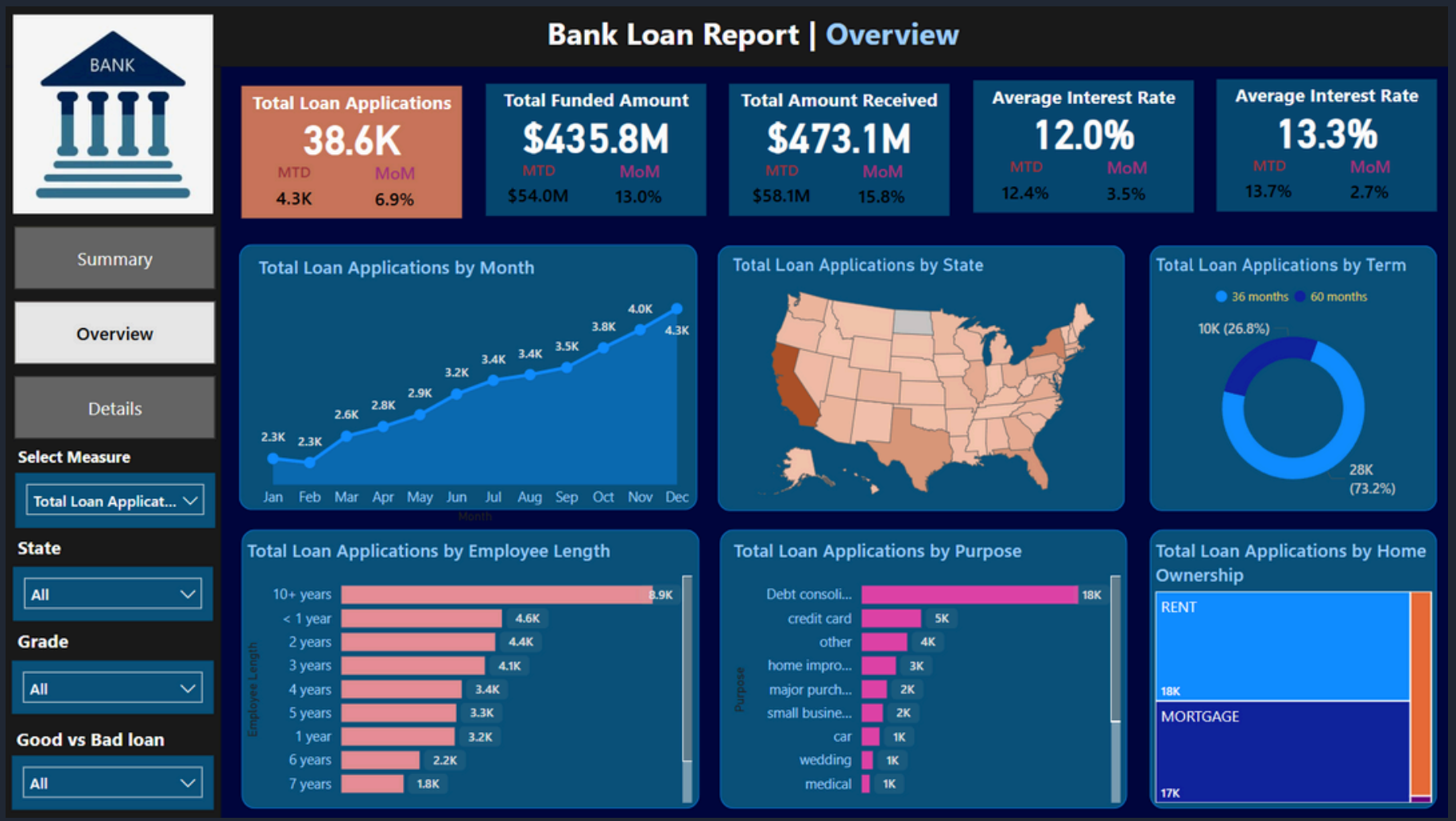
- Data Validation: Ensuring data integrity and consistency.
- Exploratory Data Analysis (EDA): Uncovering patterns and anomalies.
- Visual Analysis: Creating visual representations for deeper insights.

Dashboard 1: Executive Summary



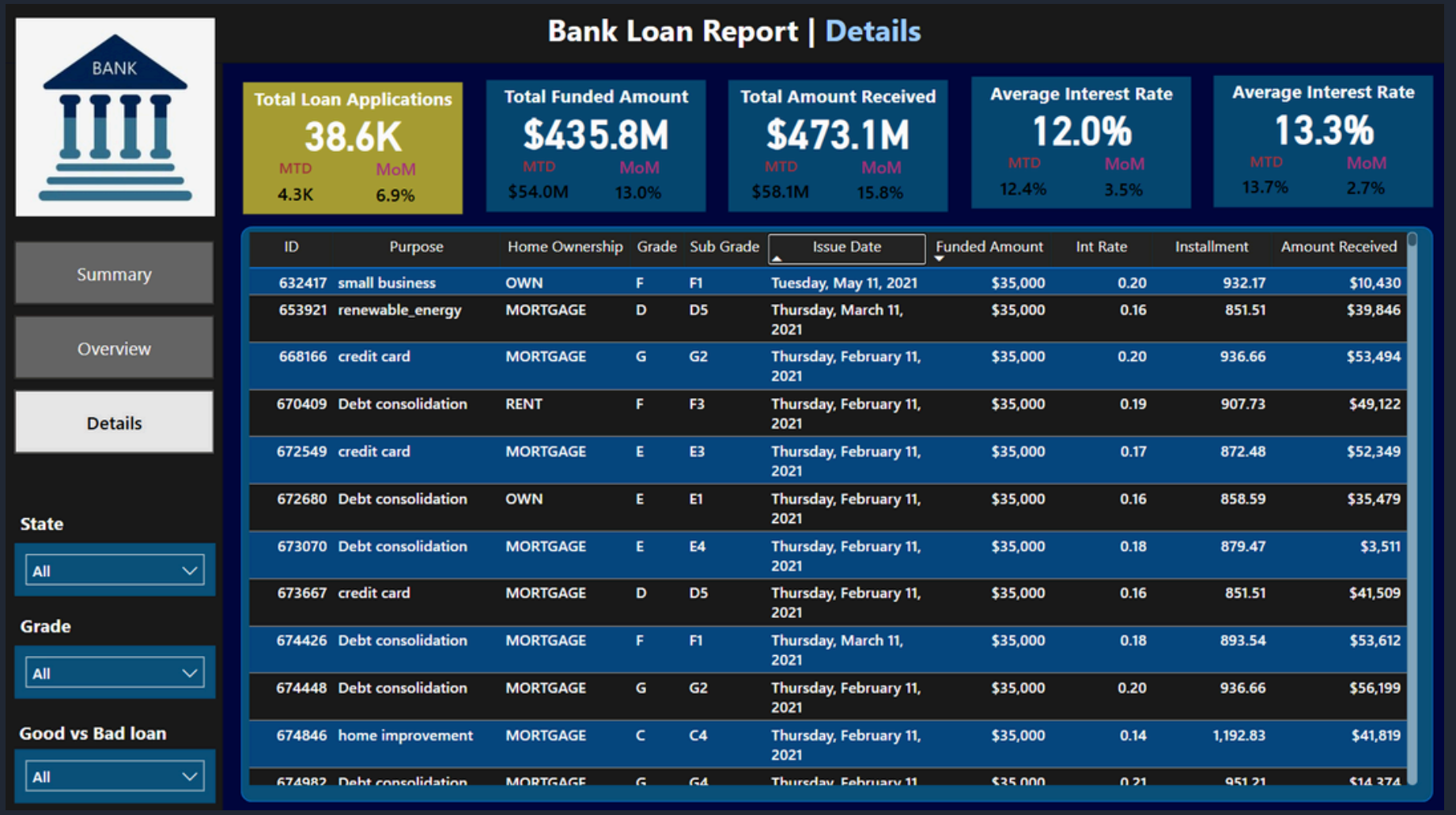
This dashboard highlights month-over-month (MoM) and month-to-date (MTD) trends, alongside crucial Good vs. Bad loan metrics and a detailed loan status grid for immediate risk assessment.

Dashboard 2: Borrower & Loan Overview



These visuals are instrumental in understanding borrower demographics and the underlying dynamics of loan performance.

Dashboard 3: Detail & Audit Trail



ID	Purpose	Home Ownership	Grade	Sub Grade	Issue Date	Funded Amount	Int Rate	Installment	Amount Received
632417	small business	OWN	F	F1	Tuesday, May 11, 2021	$35,000	0.20	932.17	$10,430
653921	renewable_energy	MORTGAGE	D	D5	Thursday, March 11, 2021	$35,000	0.16	851.51	$39,846
668166	credit card	MORTGAGE	G	G2	Thursday, February 11, 2021	$35,000	0.20	936.66	$53,494
670409	Debt consolidation	RENT	F	F3	Thursday, February 11, 2021	$35,000	0.19	907.73	$49,122
672549	credit card	MORTGAGE	E	E3	Thursday, February 11, 2021	$35,000	0.17	872.48	$52,349
672680	Debt consolidation	OWN	E	E1	Thursday, February 11, 2021	$35,000	0.16	858.59	$35,479
673070	Debt consolidation	MORTGAGE	E	E4	Thursday, February 11, 2021	$35,000	0.18	879.47	$3,511
673667	credit card	MORTGAGE	D	D5	Thursday, February 11, 2021	$35,000	0.16	851.51	$41,509
674426	Debt consolidation	MORTGAGE	F	F1	Thursday, March 11, 2021	$35,000	0.18	893.54	$53,612
674448	Debt consolidation	MORTGAGE	G	G2	Thursday, February 11, 2021	$35,000	0.20	936.66	$56,199
674846	home improvement	MORTGAGE	C	C4	Thursday, February 11, 2021	$35,000	0.14	1,192.83	$41,819
674982	Debt consolidation	MORTGAGE	G	G4	Thursday, February 11	$35,000	0.21	951.21	$14,374

This dashboard empowers analysts with a comprehensive view of individual loan performance and borrower profiles.