Bank Loan Analysis Using SQL & Power BI

Problem Statement

Banks face significant challenges in managing loan portfolios due to defaults and high-risk customers. The objective of this project is to analyze loan application data to uncover patterns in customer profiles, loan approvals, repayment behavior, and risk exposure. This will help the bank reduce default risk, optimize loan approval strategies, and identify reliable borrower segments.

Dataset Overview

The dataset includes detailed information on loan applications, with the following attributes:

1. Loan ID, Issue Date, Loan Amount, Funded Amount
2. Interest Rate, Debt-to-Income (DTI) Ratio
3. Loan Grade, Term, Purpose
4. Borrower Details: Employment Length, Home Ownership, Annual Income
5. Loan Status: Fully Paid, Current, Charged-Off

SQL Questions & Queries

1. Total loan applications and funded amounts
2. Loan approval rate (Good Loans vs. Bad Loans)
3. Monthly loan applications trend
4. Loan purpose distribution
5. Loan grade-wise and term-wise analysis
6. Interest rate and DTI comparison between Fully Paid vs Charged-Off loans
7. Top states by loan applications and defaults
8. Borrower segmentation by home ownership and employment length

Key Insights

1. 86.2% loans are Good, while 13.8% are Bad (charged-off).
2. 60-month loans show higher default rates compared to 36-month loans.
3. Debt consolidation dominates loan purpose (~18K), but carries higher risk.
4. Charged-off loans have higher average interest rates (15.1%) compared to fully paid loans (11.6%).
5. Borrowers with home ownership show lower risk compared to renters/mortgage holders.
6. Loan applications peak in Nov–Dec, showing seasonal borrowing trends.
7. Borrowers with 10+ years employment are more reliable than those with <2 years.

Business Recommendations

1. Apply stricter checks for high-risk loan grades (E, F, G) and 60-month loans.
2. Promote 36-month loans with competitive interest rates to encourage repayments.
3. Target marketing towards stable customer segments (homeowners, 10+ years of employment).
4. Develop customized products for debt consolidation with stricter safeguards.
5. Use predictive analytics for early identification of high-risk applicants (high DTI, high interest rates).
6. Adjust credit policies around seasonal peaks (Nov–Dec) to balance demand and risk.

7. Improve recovery strategies for charged-off loans using repayment reminders and restructuring options.