

## **Bank Loan Prediction Project Summary**

The Bank Loan Prediction Project focuses on analyzing and predicting customer loan performance based on key financial and demographic factors. The primary objective is to understand the relationship between various loan-related metrics such as the total number of applications, total funded amounts, total amounts received, interest rates, and debt-to-income ratios (DTI). This analysis helps financial institutions assess customer risk profiles, improve lending strategies, and reduce default rates. The project begins with comprehensive data exploration and cleaning, ensuring accuracy and completeness. Using Exploratory Data Analysis (EDA) techniques, trends and correlations among loan parameters are visualized. Tools like SweetViz were implemented to generate automated analytical reports, highlighting data distributions, correlations, and potential data quality issues. The cleaned and structured dataset serves as the foundation for detailed analytical insights and model development. A key focus of the analysis is the differentiation between “Good Loans” and “Bad Loans.” Metrics such as the percentage of good loan applications, funded amounts, and total amounts received were calculated to evaluate portfolio quality. Similarly, bad loan statistics were derived to measure risk exposure and help identify patterns among defaulted borrowers. These insights enable banks to adopt data-driven decision-making approaches to improve loan approval and monitoring processes. The project also includes multiple dimensions of analysis:

1. **Regional Analysis:** Loan data is aggregated by state to visualize total applications, funded amounts, and repayments. Filled geographic maps highlight states with high or low loan activities.
2. **Loan Term Analysis:** Loans are analyzed by duration (e.g., 36-month or 60-month terms) using donut charts to compare application volumes, funded amounts, and repayments. This helps identify borrower preferences and repayment performance by term length.
3. **Loan Purpose and Ownership:** The project explores how loan purposes (such as credit card, home improvement, or debt consolidation) affect funding trends and repayment rates. Additionally, ownership categories like “Rent,” “Mortgage,” or “Own” are studied to understand their impact on loan performance. Tree maps and categorical charts are used to visualize these insights.

Predictive modeling techniques, such as regression and classification algorithms, are suggested for future extension of this analysis to forecast loan defaults and creditworthiness. The project provides a strong analytical foundation by visualizing and interpreting the factors that most influence loan approval and repayment outcomes. In conclusion, the

Bank Loan Prediction Project provides an end-to-end overview of the loan performance landscape. It integrates data preprocessing, visualization, and descriptive analytics to reveal valuable business insights. These findings can guide financial institutions in risk management, customer segmentation, and strategy optimization. By combining data analytics with predictive modeling, the project supports smarter, evidence-based lending decisions that contribute to a more stable and profitable banking environment.