# Bank Loan Analysis Project Documentation

## 1. Project Overview

The Bank Loan Analysis project is designed to analyze financial performance, loan applications, and customer loan behavior. Using Excel, we provide a detailed dashboard that visualizes key metrics to derive actionable insights.

### Objectives

- Analyze total loan applications, funded amounts, and received amounts.  
- Visualize metrics such as loan performance by grade, term, and purpose.  
- Identify trends in loan approval and repayment behavior.

## 2. Dataset Overview

### Data Used

Dataset Name: Bank Loan Performance Data  
Key Columns:  
- Loan Grade: Grades A to G assigned to loans based on creditworthiness.  
- Loan Term: Duration of the loan (e.g., 36 months, 60 months).  
- Loan Purpose: Purpose of the loan (e.g., car, credit card, debt consolidation).  
- Employment Length: Duration of the borrower's employment.  
- Homeownership: Type of homeownership (e.g., rent, mortgage, own).  
- Funded Amount: The amount disbursed for loans.  
- Received Amount: Payments received for loans.  
- Interest Rate: Rate of interest charged on loans.

## 3. Steps to Build the Project

### Step 1: Data Collection and Cleaning

1. Import Data:  
- Use 'Data > Get External Data' to import CSV or Excel files into Excel.  
- Ensure proper mapping of columns and standardize formats (e.g., date and numeric formats).  
  
2. Data Cleaning:  
- Remove duplicates using 'Data > Remove Duplicates'.  
- Handle missing values by filling with averages, medians, or placeholders.  
- Normalize categorical values to ensure consistency (e.g., '36 months' vs. '60 months').

### Step 2: Data Analysis

1. Calculate Metrics:  
- Use formulas such as SUM, AVERAGE, COUNTIF to compute:  
 - Total Loan Applications  
 - Average Interest Rate  
 - Funded and Received Amounts  
  
2. Group Data:  
- Use Pivot Tables to analyze loans by:  
 - Grade  
 - Loan Purpose  
 - Term and Employment Length  
 - Homeownership Type

### Step 3: Data Visualization

1. Create Charts:  
- Bar Chart: Display loan performance by grade and purpose.  
- Line Chart: Show monthly loan application trends.  
- Pie Chart: Visualize loan distribution by homeownership type.  
  
2. Add Interactivity:  
- Use slicers for filtering by grade, term, and purpose.  
- Apply conditional formatting to highlight significant trends or outliers.

### Step 4: Building the Dashboard

1. Layout Design:  
- Top Section: Key metrics like total applications, funded amount, and average interest rate.  
- Main Section: Interactive charts for performance and trends.  
- Filters: Slicers for grade, term, and purpose.  
  
2. Formatting:  
- Use financial domain-appropriate colors (e.g., green for positive trends, red for negative trends).  
- Include data labels and annotations for clarity.

## 4. Insights and Key Metrics

- Majority of loans are graded A and B, indicating high creditworthiness.  
- Debt consolidation is the primary loan purpose.  
- Loans with 36-month terms show higher repayment rates compared to 60-month terms.  
- Homeowners with mortgages account for the majority of loan applications.

## 5. Tools and Techniques Used

- Excel Features:  
 - Pivot Tables  
 - Charts (Bar, Pie, Line)  
 - Slicers  
 - Conditional Formatting  
- Formulas:  
 - SUM, AVERAGE, COUNTIF, IF  
 - VLOOKUP/INDEX-MATCH for mapping data relationships.

## 6. Benefits and Limitations

### Benefits:

- Provides detailed insights into loan performance and borrower behavior.  
- Supports data-driven decision-making for financial planning.  
- Identifies trends for strategic improvements.

### Limitations:

- Limited granularity for borrower demographics.  
- Static data; real-time integration requires additional tools.

## 7. Conclusion

The Bank Loan Analysis Project leverages Excel's powerful features to analyze key financial metrics. Through interactive dashboards and detailed visualizations, stakeholders can gain actionable insights to enhance loan processing and decision-making. Future enhancements could include real-time data integration and advanced analytics with tools like Power BI.