# Lending Club Loan Analysis - Case Study

This case study notebook analyses Lending Club’s loan data to uncover patterns, risk factors, and insights into loan default trends. By exploring various customer and loan attributes, the goal is to help the company make more informed and data-driven lending decisions, ultimately improving credit risk management.

## Objectives

### Analyse Customer and Loan Attributes to Detect Default Trends

Investigate how different customer demographics, loan features, and financial factors are linked to default rates. This involves examining variables like income, credit score, loan amount, and purpose of the loan to identify any trends or correlations with defaults.

### Provide Actionable Insights to Minimize Credit Losses

Based on the data analysis, offer practical recommendations for minimizing credit losses. These insights will guide the company in refining its lending strategies, optimizing credit assessments, and identifying higher-risk borrowers before approving loans.

### Explore Key Variables Driving Loan Defaults Using EDA

Conduct exploratory data analysis (EDA) to uncover the main factors contributing to loan defaults. By visualizing the data and testing various hypotheses, we aim to pinpoint which variables most strongly influence default rates and provide clarity on the underlying risk drivers.

## Data Cleaning

1. Fix the missing values
2. Removing the columns having more than 90% missing values
3. Dropping the two columns

## Exploratory Data Analysis

### Loan Status Overview

A graph of a loan status

Description automatically generated

### Analyse loan amount vs. loan status

A graph of a graph with different colored squares

Description automatically generated with medium confidence

### Interest rates by loan status

A graph of a graph with different colored squares

Description automatically generated with medium confidence

### Loan Purpose Distribution

A graph showing a number of different colored bars

Description automatically generated

## Key Observations and Business Takeaways

### Impact of Loan Amount on Defaults:

Larger loan amounts tend to be associated with a higher risk of defaults. This finding suggests that it may be worthwhile for Lending Club to introduce more stringent limits or thorough evaluations for loans with higher values, enabling more effective management of potential losses.

### Interest Rates and Their Impact on Defaults

Loans with higher interest rates are more frequently linked to defaults, indicating that these borrowers often present higher risk. As a result, Lending Club may need to reassess its pricing strategy and refine its risk assessment models to better account for the risk profiles of these borrowers.

### Loan Purpose and Default Rates

A notable percentage of defaults occur among loans for "debt consolidation." To address this, it could be beneficial for Lending Club to diversify its loan portfolio and introduce stricter eligibility criteria for borrowers seeking debt consolidation loans, reducing exposure to defaults in this particular category.

### Income Levels and Default Patterns

Finally, borrowers with annual incomes below $50,000 exhibit higher default rates. This suggests that lower-income borrowers may face greater challenges in repaying loans. To mitigate this risk, Lending Club could enhance its credit evaluations or adjust its lending criteria for individuals in this income group.