Lending Club Case study

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Problem Statement

The aim is to identify patterns which indicate if a person is likely to default

Project Outlines

1. Data Cleaning
2. Exploratory Data Analysis
3. Suggestions and Recommendations

- Further Data processing
- Suggestions on data quality

Part I

Data Cleaning

1. Examining the dataset

Shape

The dataset has 39,717 rows and 111 columns

Data types

There are 3 data types: Float, Integer, and Object

Primary columns

- Column 'id' : unique id for each loan
- Column 'member_id': unqiue id for each person

2. Data Cleaning

2.1 Missing values (part 1)

- Dropping all null columns

2.2 Data Filtering (part 1)

- Deduplicate the dataset
- Dropping the unimportant columns

2.3 Invalid values (part 1)

- Removing symbols from numeric columns
- Trimming leading spaces from categorical columns
- Check for column with wrong data types
- Check for columns with only one unique value

2. Data Cleaning

2.4 Invalid values (part 2)

- Check for columns with only one unique value

2.5 Missing values (part 2)

- Filling in missing values in columns

2.6 Data Filtering (part 2)

- Dropping current loan

2.7 Standardise values

- Removing outliers

Part II

Exploratory Data Analysis (EDA)

1. Univariate & Segmented Univariate Analysis

Here are some key insights

01

14,5% defaulted in the lending dataset

02

The *percentage of default loan* is higher in *shorter term* (36 months)

03

The defaulted loans tend to have *higher interest rates* than non-defaulted loans

04

Mortgage and Rent is the home ownership type that has the highest number of defaulted loan

05

Borrowers that have *no information of employment* has the *highest rate of defaulted loans*

06

The defaulted loans has *less annual income* than non-defaulted loan.

2. Bivariate Analysis

- Comparing loan amount, funded amount and funded amount by investors
- Create cross table for pairs of columns

Here are some key insights

01

Loan amount >= Funded amount >= Funded amount by investors

-> *aligned to business sense*

02

For 36 months term, borrowers have *Rent* is the most popular while for 60 months term, *Mortgage* is the most popular

03

Borrowers have *Mortgage* has better grade than *Rent;*

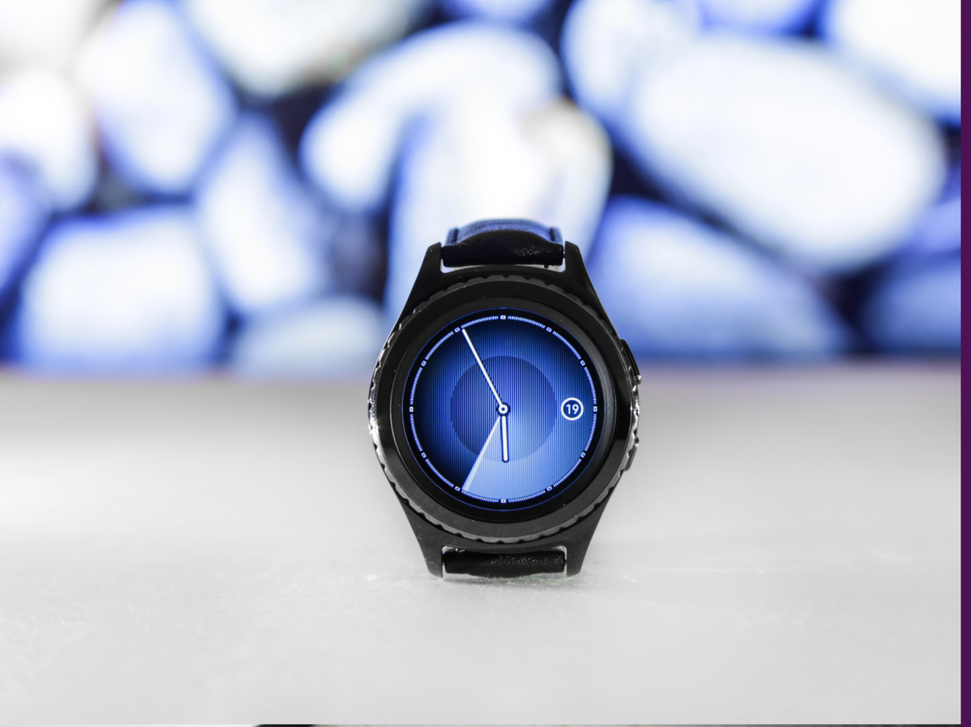
Borrowers have *Rent* type of home has a lot of loan in lower grade like B,C,D,E.

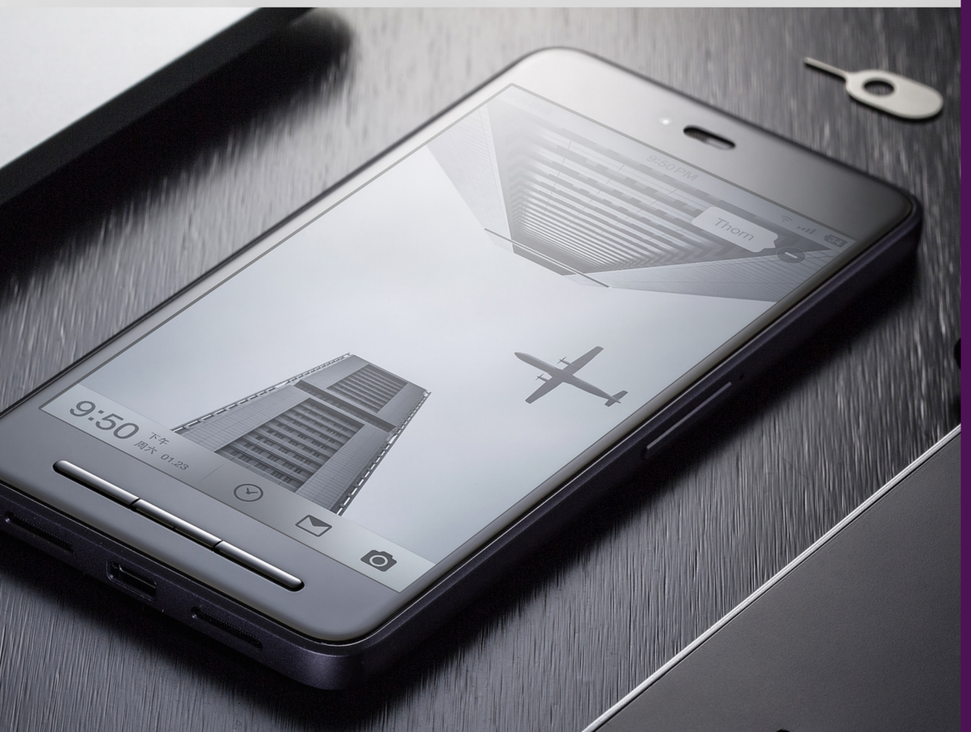
3. Derived metrics

- Business driven: actual tenor
- Type driven: binning annual income
- Data driven: boolean column for loan status

Part III

Suggestions & Recommendations





Data Quality

01

Adding business-related column:

- year of the loan
- end date of the loan
- type of interest rate
- demographic of borrower

02

Missing values handling for better data quality:

- all null columns
- one unique value column

Further Data Preprocessing (optional)

Methods preparing data for ML models

- Standard Scaler (for numeric columns)
- One-hot encoding (for categorical columns)
- Dimensionality Reduction (PCA)
- ...

The end