Lending Club Case Study

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Problem Statement:

A consumer finance company, which specializes in lending various types of loans to urban customers, makes a decision for loan approval based on the applicant's profile. If the applicant is likely to repay the loan, then not approving the loan results in a loss of business to the company. Also if the applicant is not likely to repay the loan, i.e. he/she is likely to default, then approving the loan may lead to a financial loss for the company.

Using the information about past loan applicants, who have fully paid and has been charged-off, identify the patterns which indicate a person is likely to default or is not likely to default. This inputs may be used for taking action such as denying the loan, reducing the amount of the loan or lending (to risky applicants) at a higher interest rate, etc.

The goal of this case study is to minimise the risk of losing money while lending to customers.

Using Exploratory Data Analysis (EDA), understand how consumer attributes and loan attributes influence the tendency of default And also understand driving factors (or driver variables) behind the loan default, i.e. the variables which are strong indicators of default.

The company can utilise this knowledge for its portfolio and risk assessment.

Risk Analytics EDA : Process Flow

Feedback Driving Factors / Driver Variables using Risk Analytics EDA
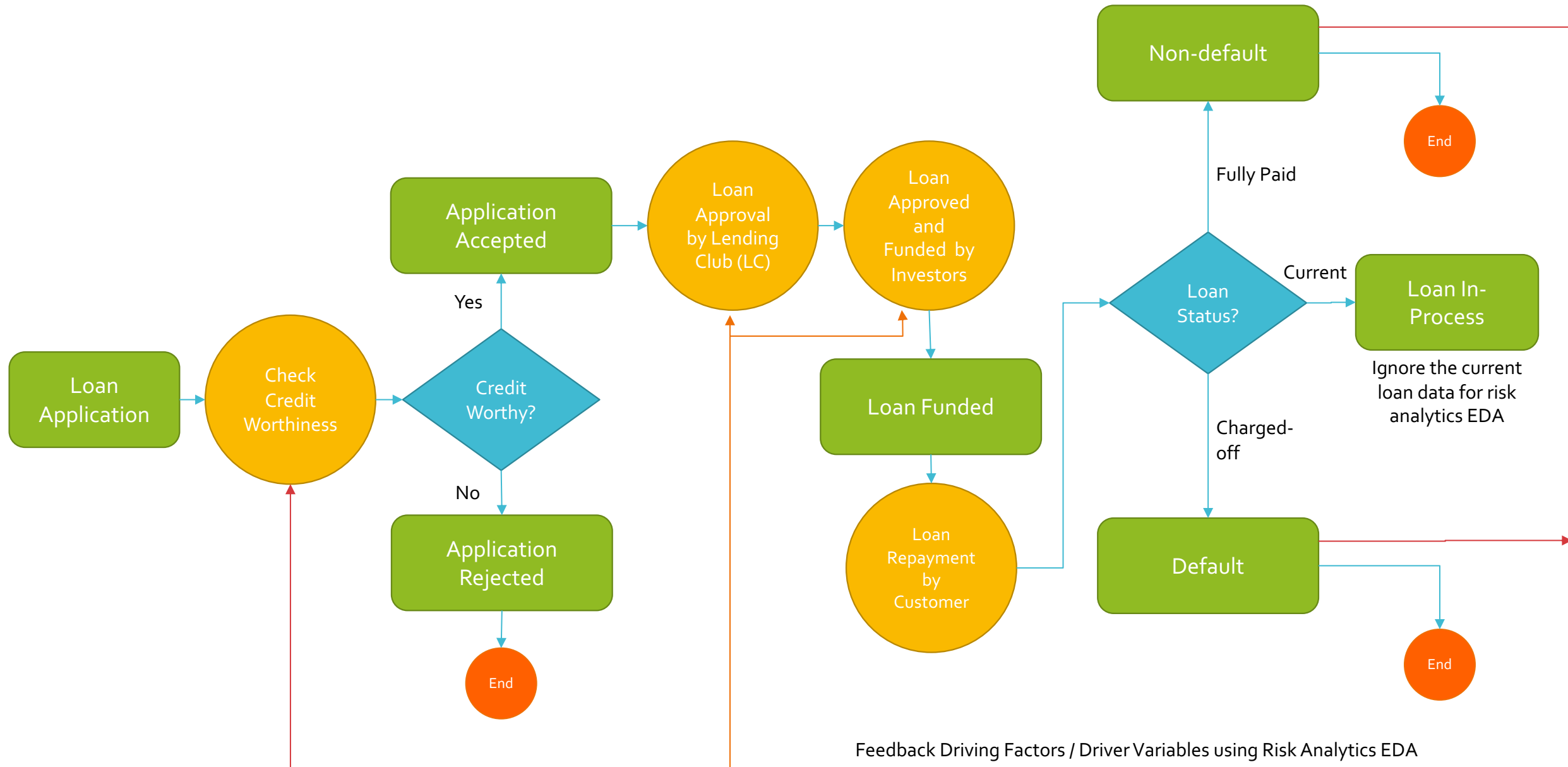
Following Customer and Loan attributes are analyzed for the case study.
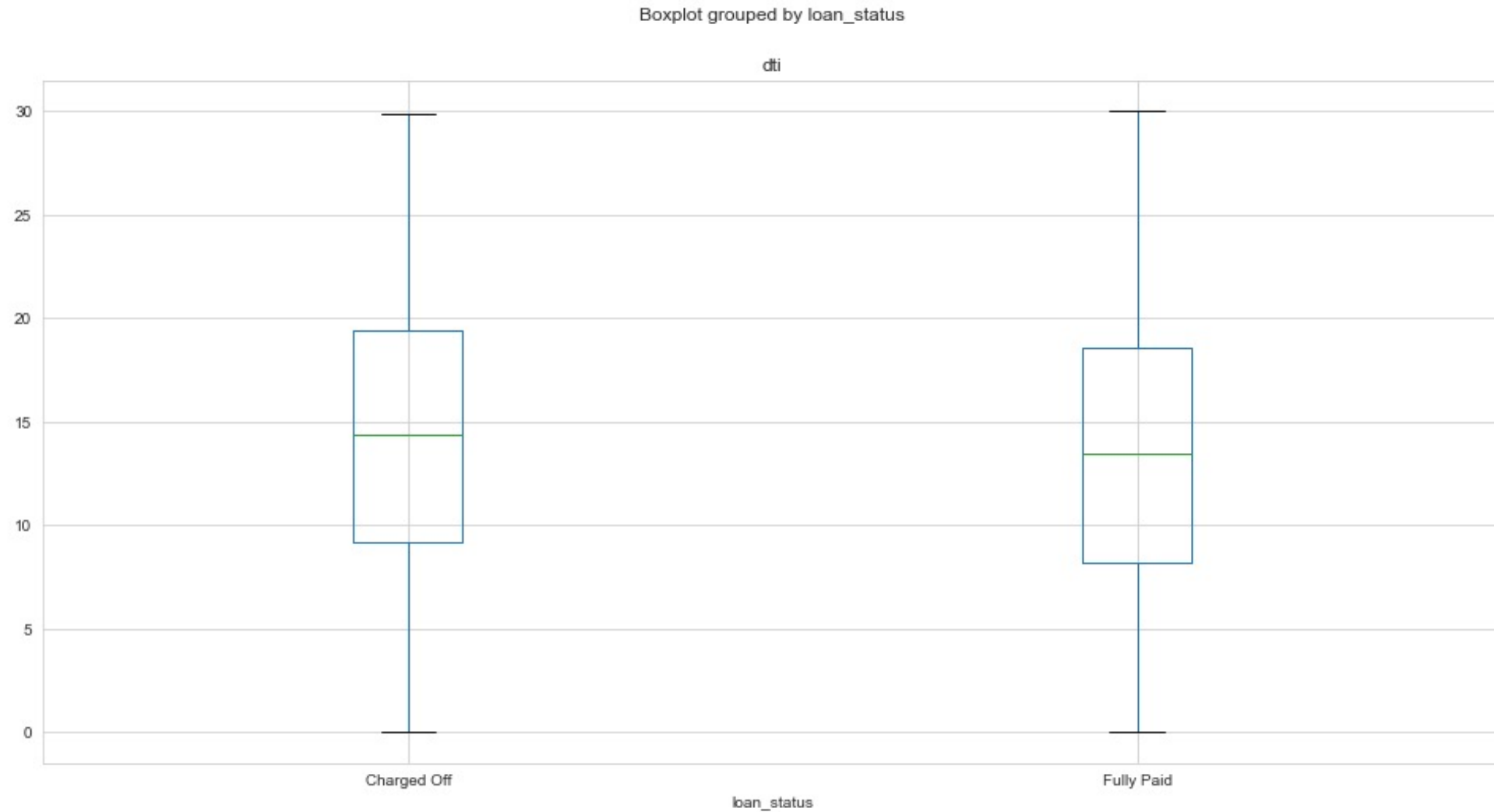
Customer Attributes:

1. Annual income of the borrower
2. Employment length
3. Home ownership status
4. Income verification status
5. Debt-to-Income ratio

Loan Attributes:

1. Loan amount
2. Term of the loan
3. Interest rate
4. Loan grade
5. Loan subgrade
6. Purpose of the loan
7. Loan issue date
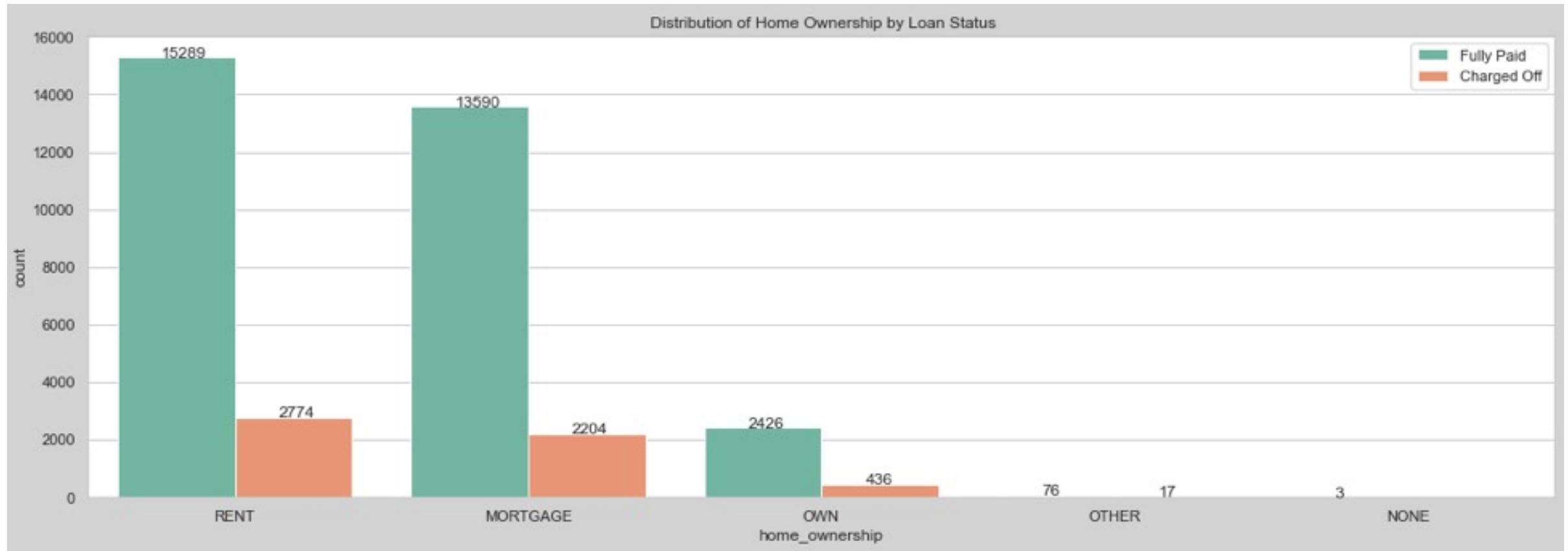
Boxplot grouped by loan_status

dti

Observation: The loan borrowers with lower Debt-to-Income ratio are more likely to be non-defaulter.

Data Analysis - Impact of 'purpose' attribute on 'loan_status'
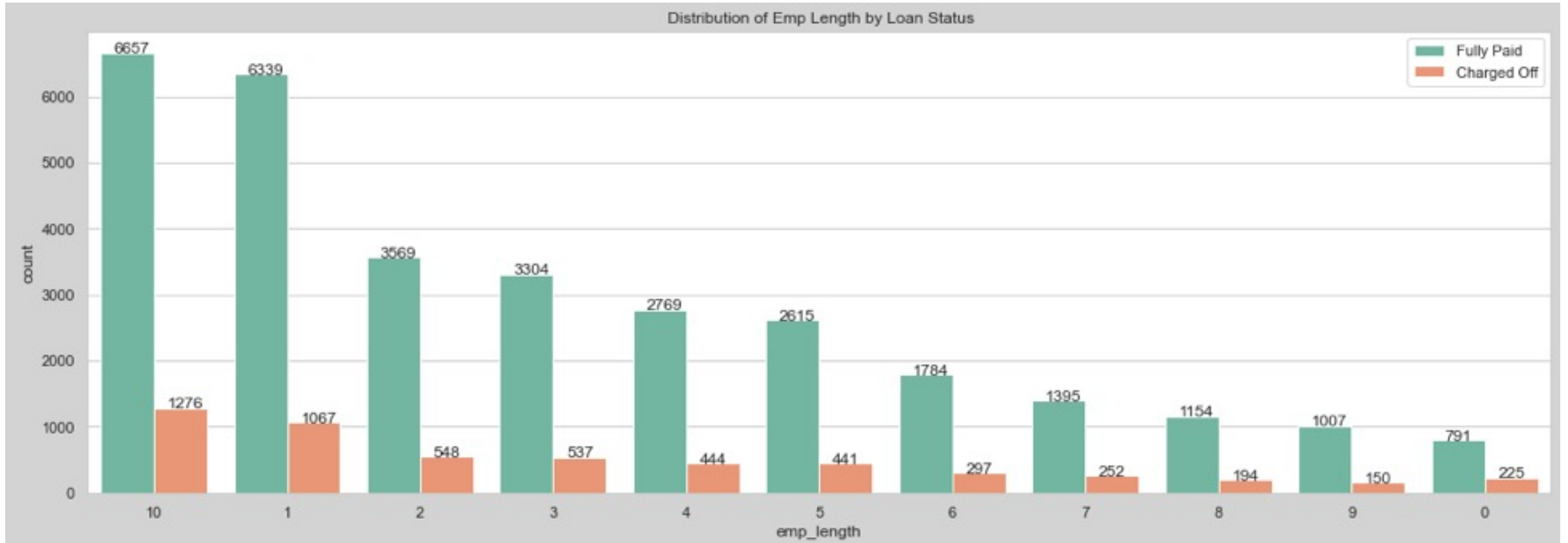

Distribution of Purpose by Loan Status
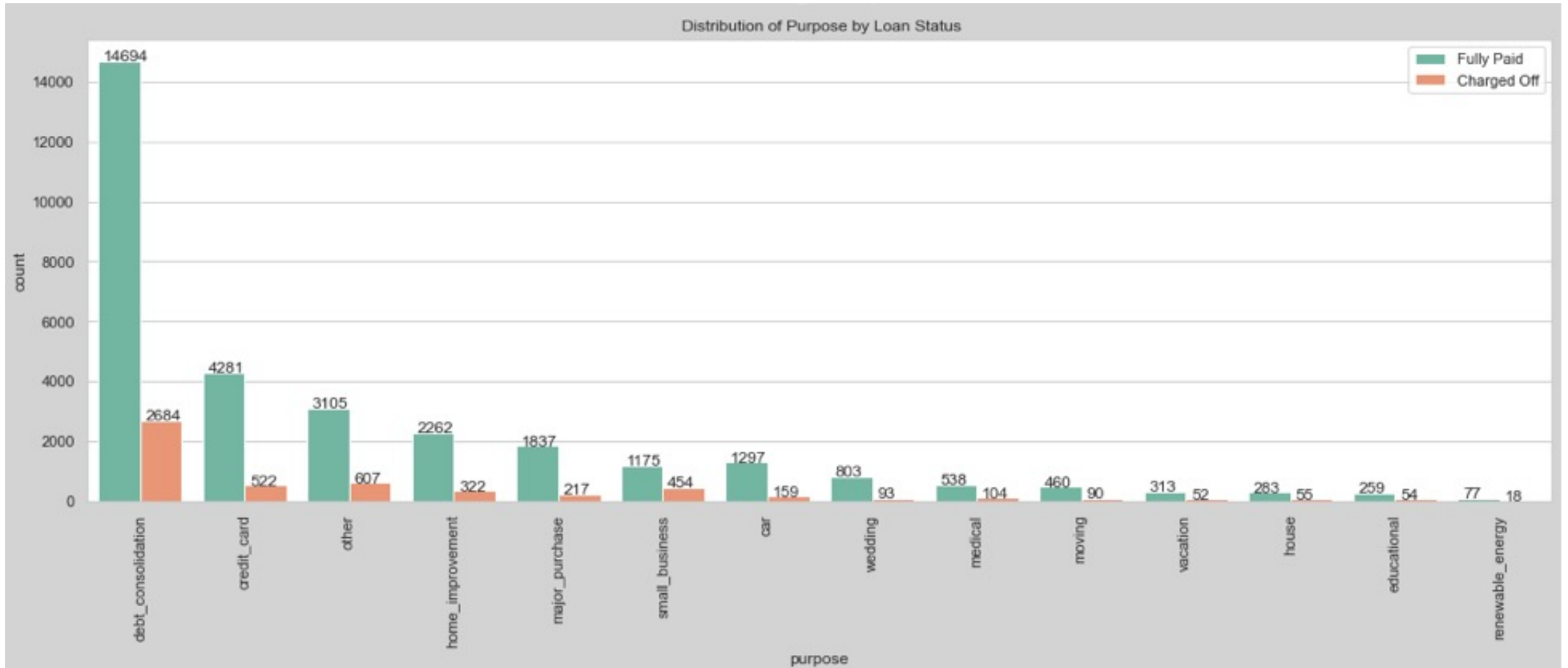
Observation: The loans taken by borrowers for Debt Reconciliation have defaulted more.

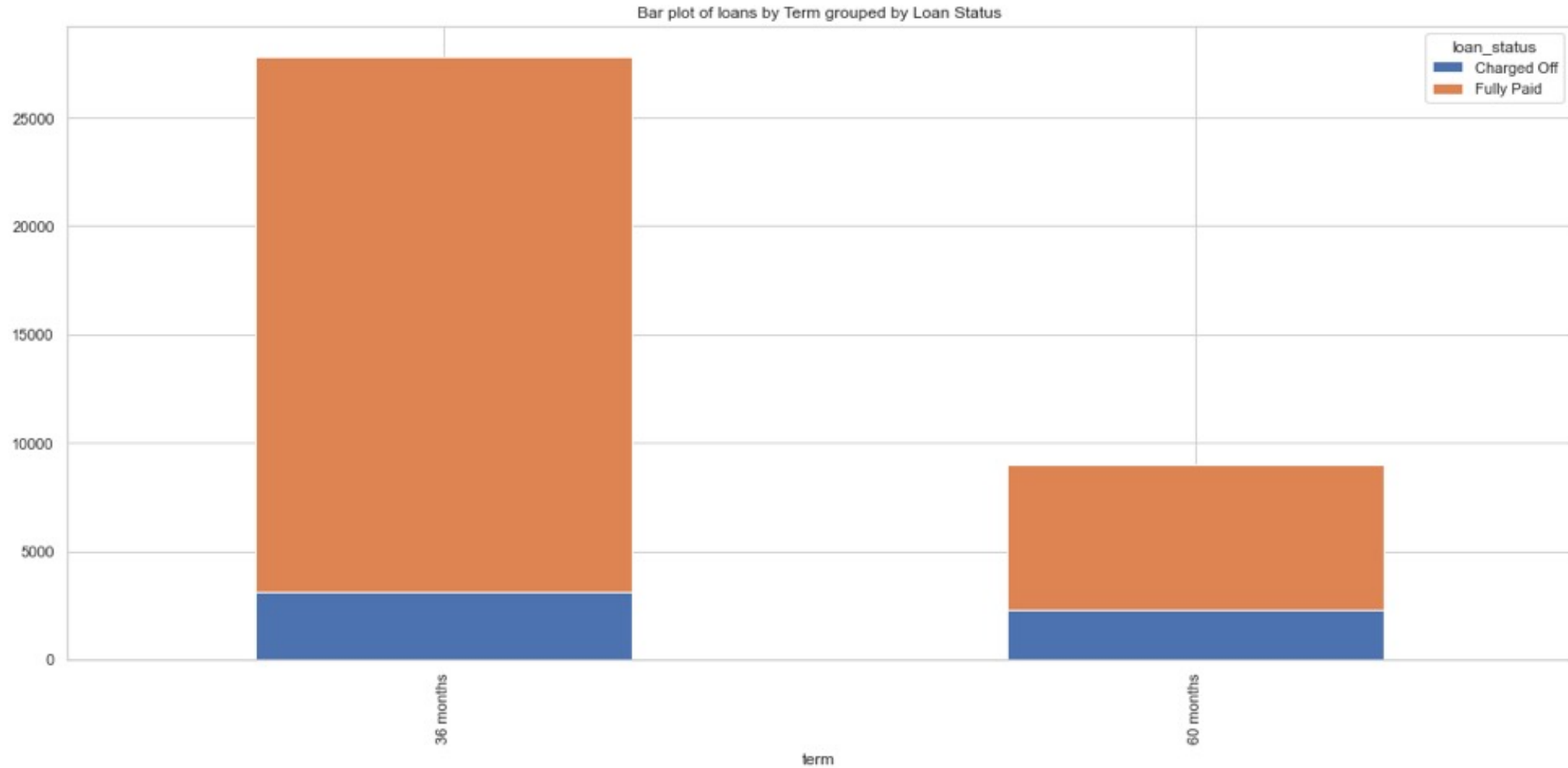# Data Analysis - Impact of 'home_ownership' attribute on 'loan_status'

Distribution of Home Ownership by Loan Status

Observation: The loans taken by borrowers having the home rented or mortgaged have defaulted more.

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Bar plot of loans by Term grouped by Loan Status

Observation: The loans taken by borrowers having the home rented or mortgaged have defaulted more.

Driver Variables

1. dti (Debt-to-Income ratio)
2. purpose (Purpose of the loan)
3. home_ownership (Home Ownership Status)
4. emp_length (Employment Length)
5. term (Term of the loan)

Recommendations

1. Reject loans of loan applicants with dti (Debt-to-Income) ratio > 18.

2. Reject the loans for loan applicants having purpose of 'For Debt Reconciliation'. Also reduce the loan amount for loan applicants having purpose of 'Credit Card'.

3. Increase the Interest Rate for loan applicants with home ownership status as 'Rented' or 'Mortgaged' as the risk of lending is higher.

4. Verify the income sources and dti ratio before granting the loans to the loan applicants with experience of 10 years or more and with experience of 1 year and less.

5. The loans funded for higher terms are more likely to get defaulted, hence keep the interest rate on higher side to cover the risk.

Contact:

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- Thank you!