

Lending Club Case Study

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Objective

Objective: The aim of this case study is to apply Exploratory Data Analysis (EDA) techniques to a real-world problem, uncover meaningful insights, and present them in a business-focused manner through a presentation.

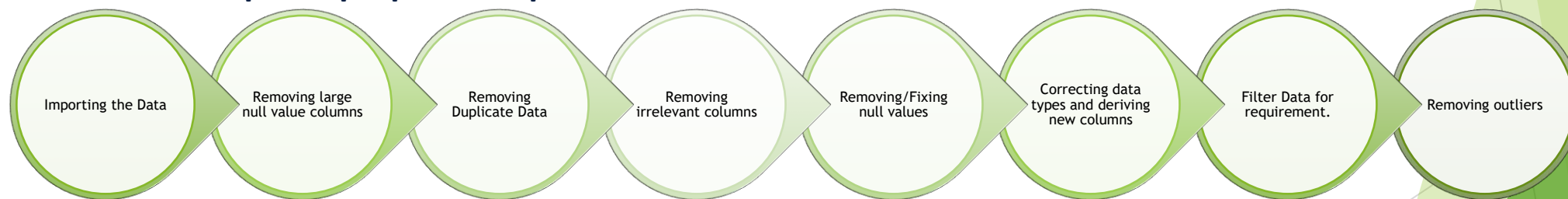
Benefits of the Case Study:

- Provides an understanding of how EDA is utilized in addressing real-world business challenges.
- Develops a foundational knowledge of risk analytics within the banking and financial services sectors.
- Demonstrates how data is leveraged to minimize financial losses when lending to clients.
- Enhances comprehension of data visualization and the appropriate use of charts for real-world data analysis.

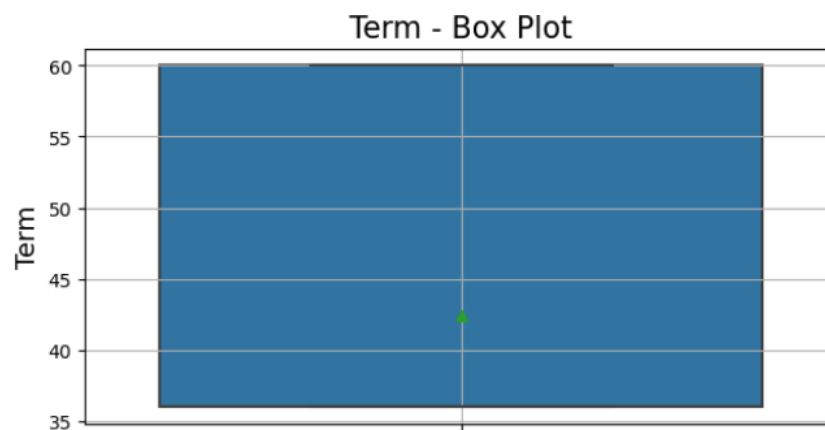
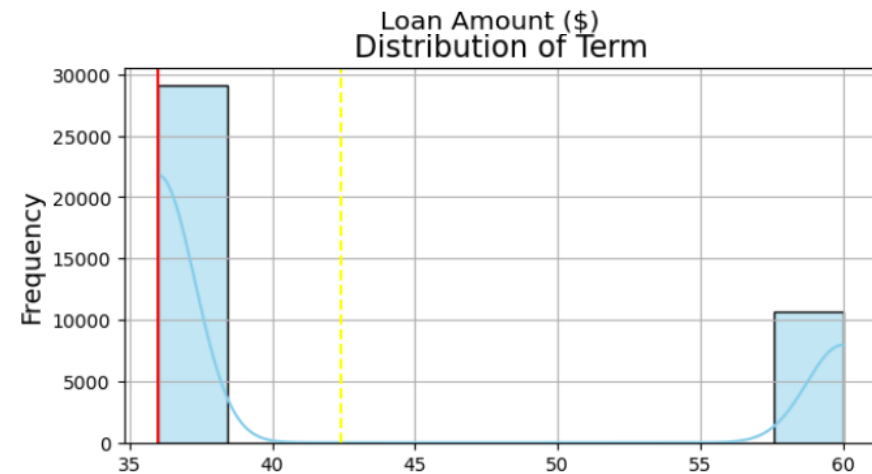
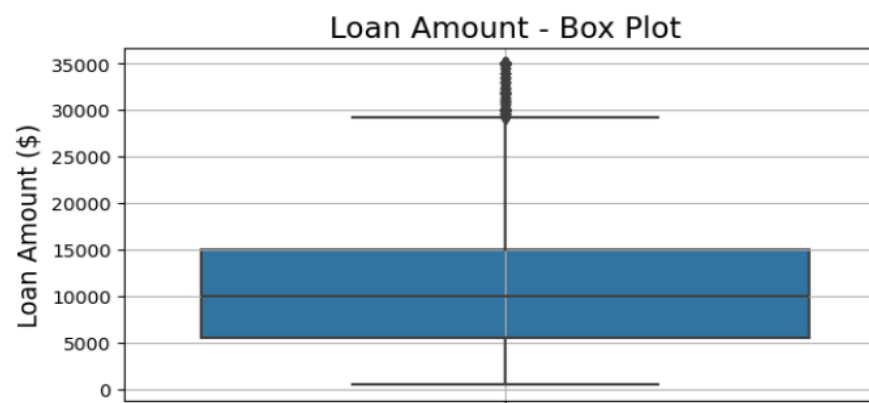
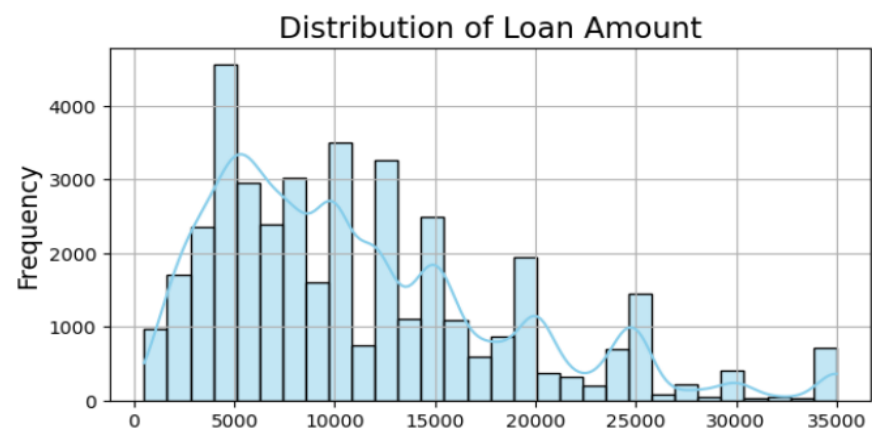
Business Understanding

- ▶ **Business Objective:** The goal is to make informed decisions on whether to approve or reject loan applications based on specific variables.
- ▶ **Dataset Details:**
The dataset provided includes information on past loan applicants, indicating whether they defaulted or not. The data pertains only to approved loans and does not include rejected applications. The loan status is categorized into three types: Fully Paid, Current, and Charged-Off.

Data Clean-up and preparation process:

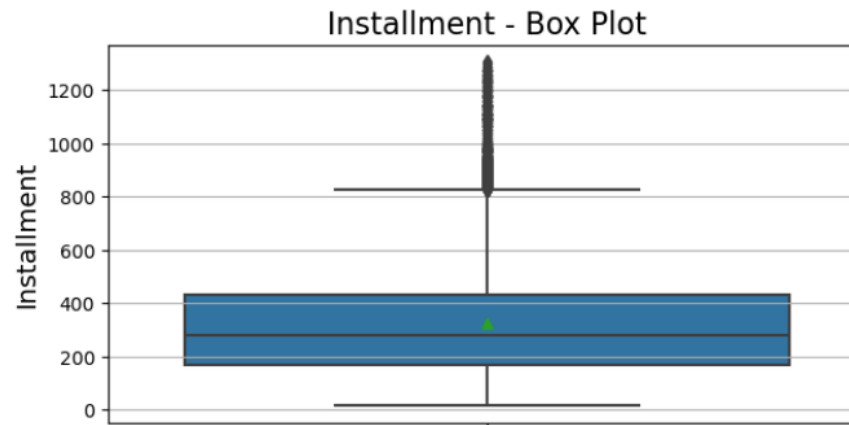
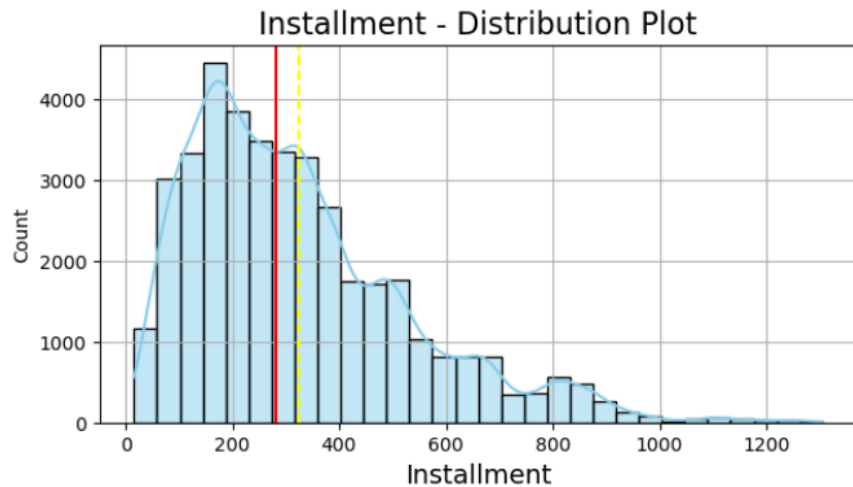


Distribution of Loan Amount & Term



Most of the borrowers taken loan amounts between 5500 - 15000
99-95 percentile of loan amounts are below 30000
36th months are more borrowers

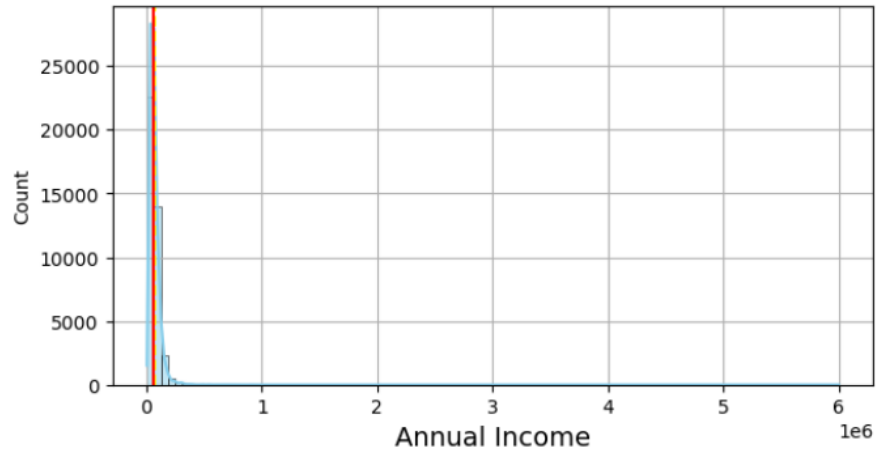
Installment



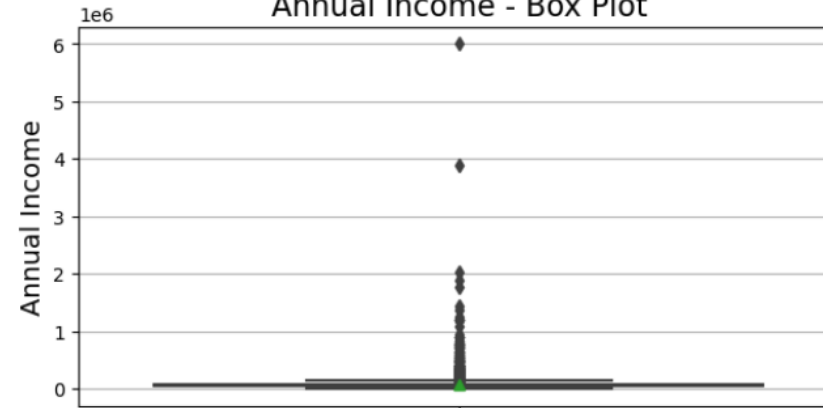
- Most of the instalments are in between 167 to 430
- lowest installment is 15 and highest installment is 1305
- High installment borrowers are few and low installment borrowers are high

Annual Income

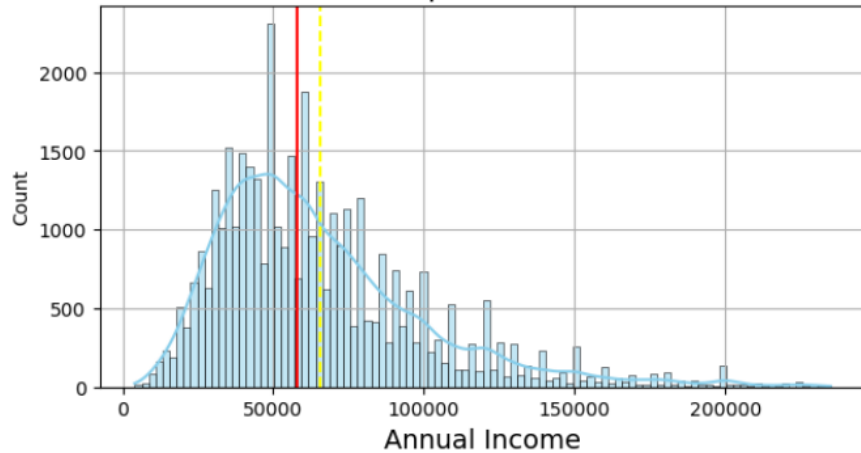
Annual Income - Distribution Plot



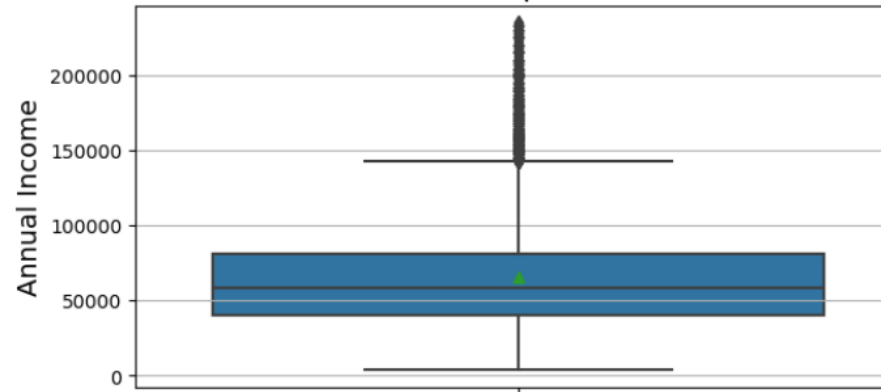
Annual Income - Box Plot



Annual Income 99th percentile - Distribution Plot

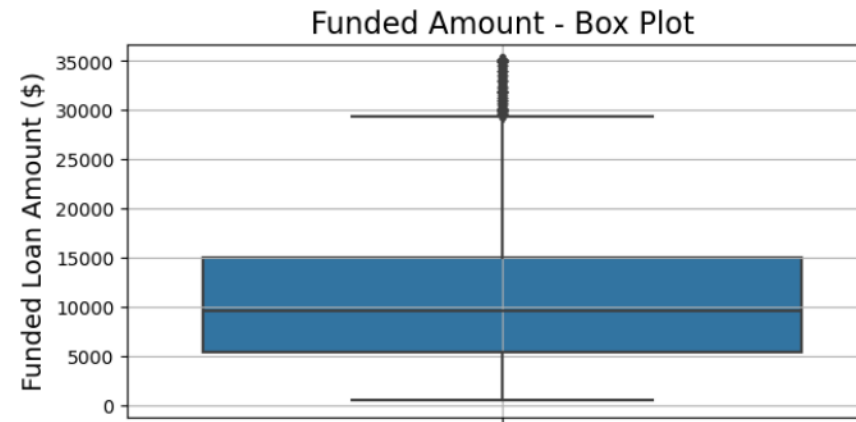
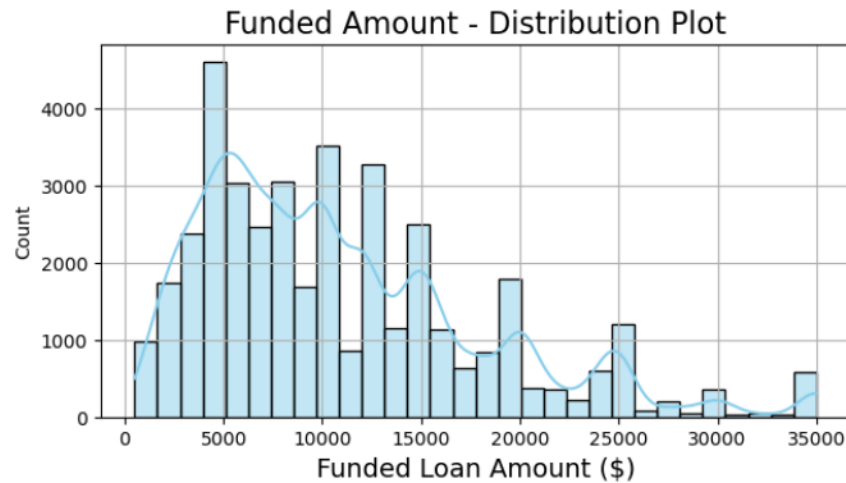


Annual Income 99th percentile - Box Plot



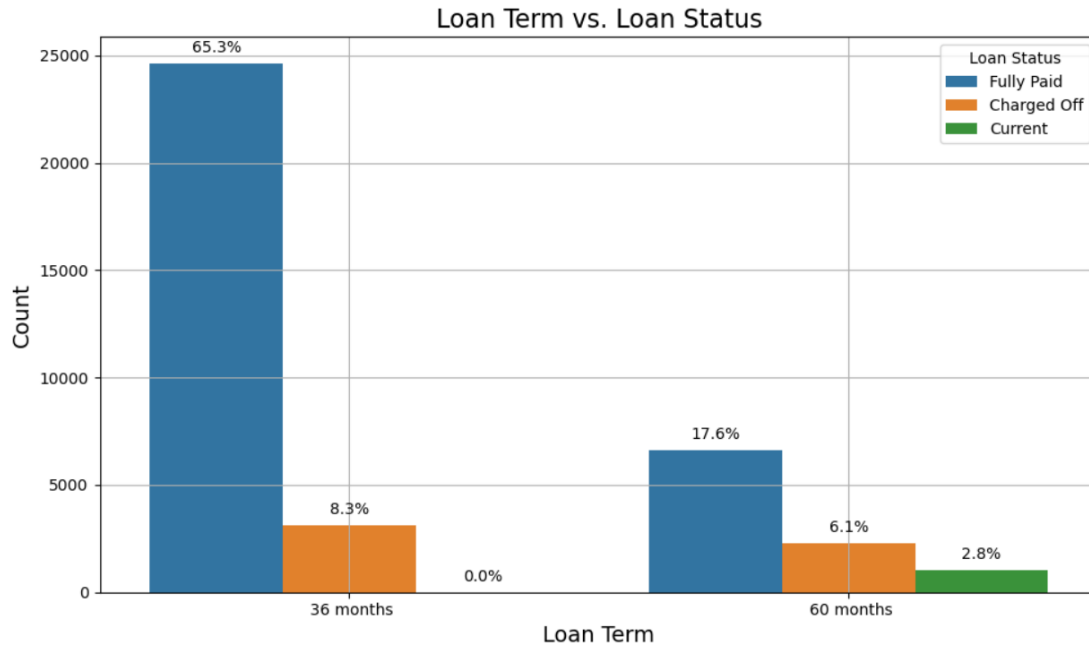
50000 thousand annual income borrowers are more with compare to other income borrowers.

Funded Loan

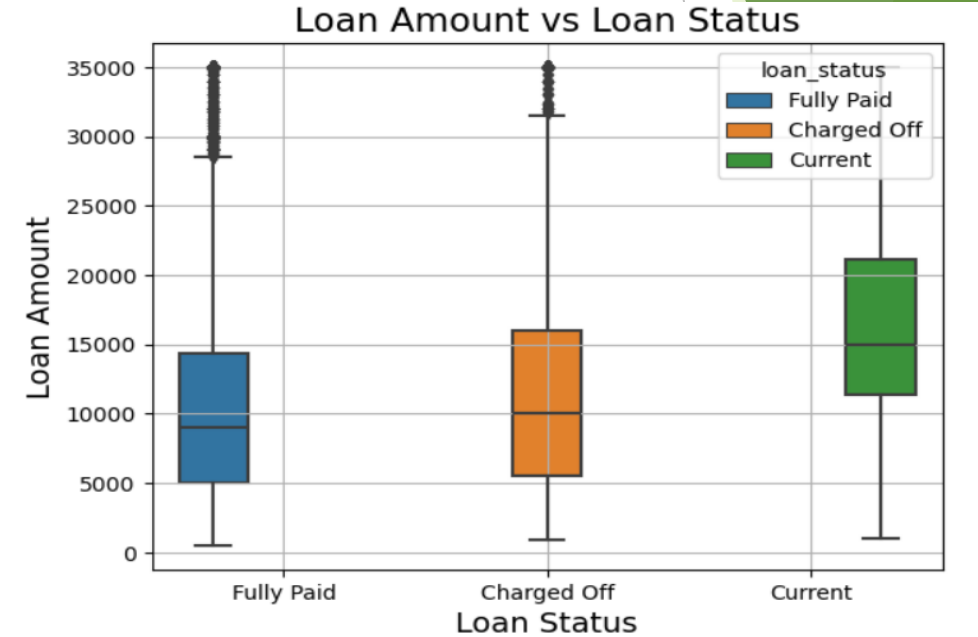


Most of the Funded amount is in between 5500 - 15000
99-95 percentile of Funded amounts is below 30000

Loan Status and Amount

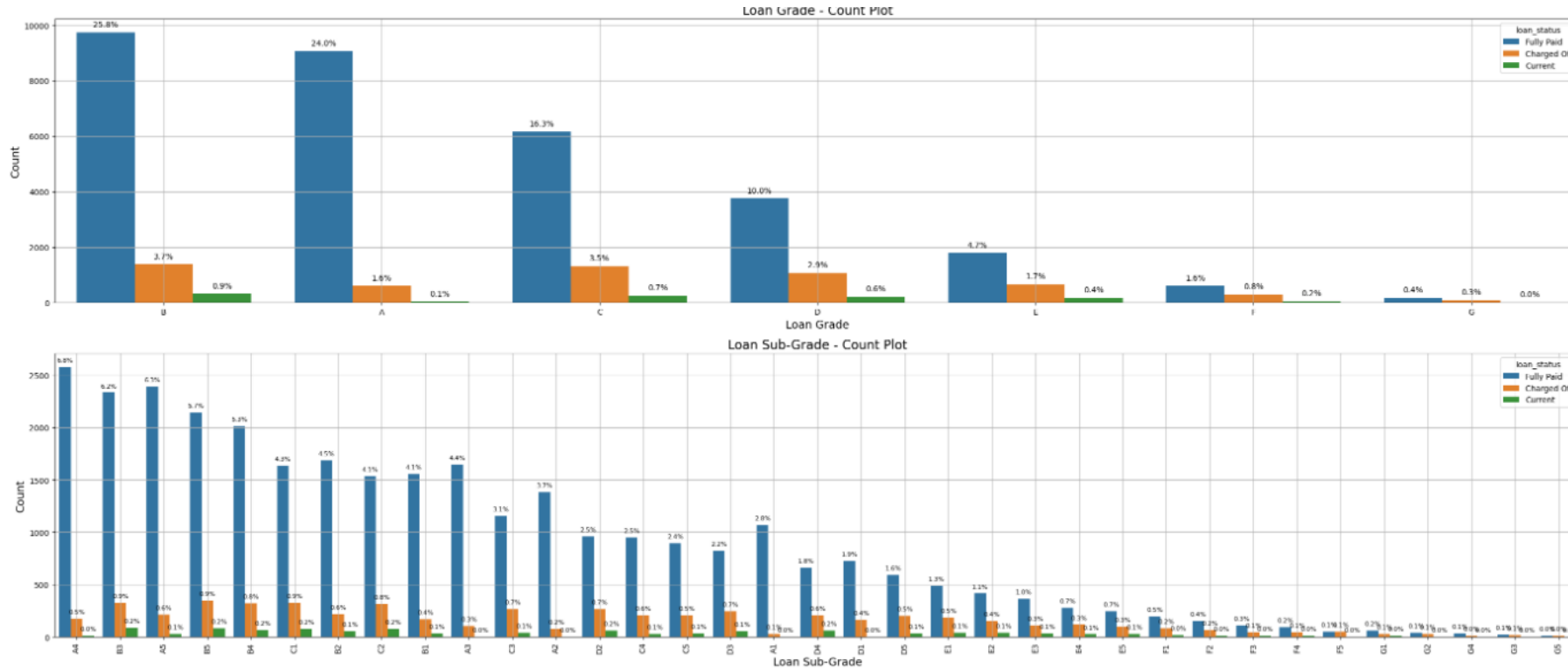


- **Loan Status:** The number of charged off loan is much smaller(14.5%) compared to total count.



- **Loan Amount:** It varies from 500 to 35000 with a median of 10000. Loan amount is majorly small and very few clients have taken large loans and larger it goes we have higher chance of defaulting.

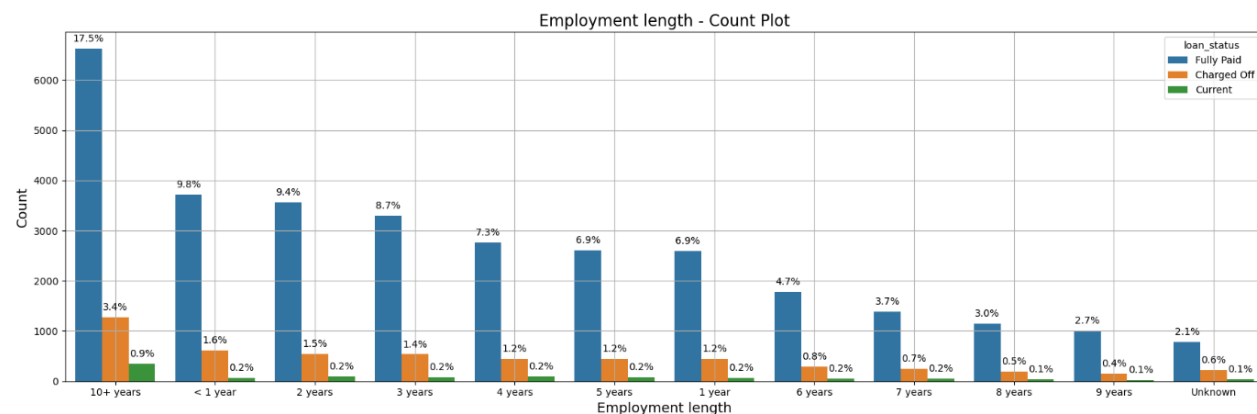
Grade and Sub-Grade



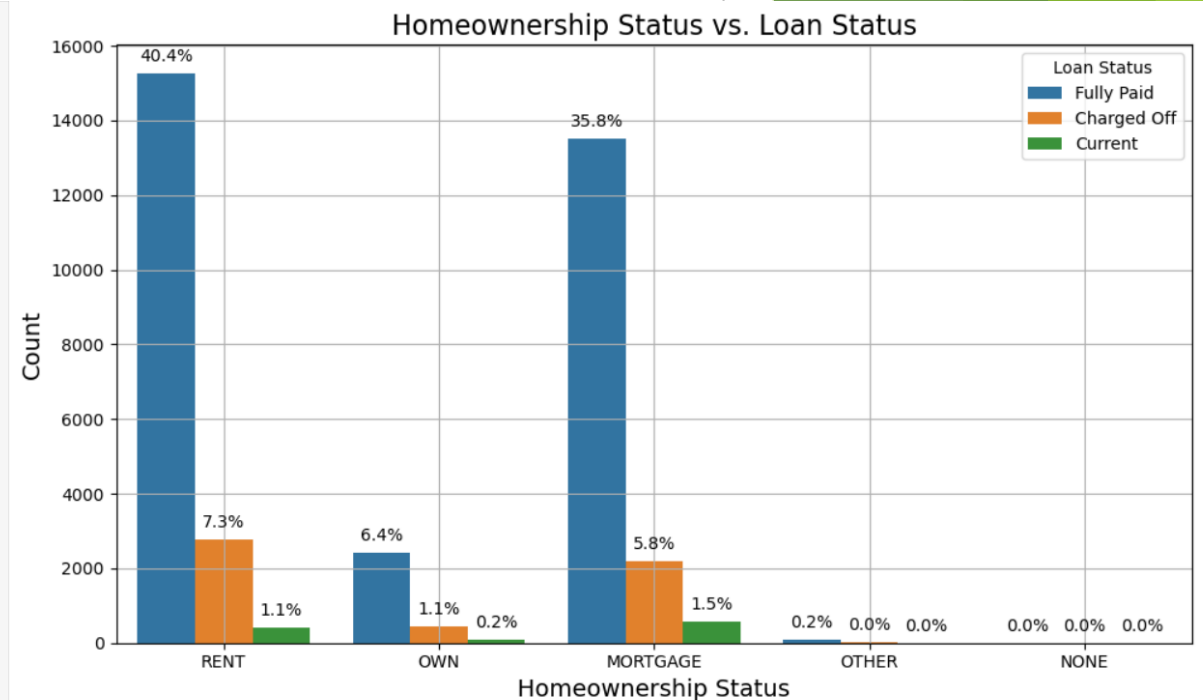
- **Grade:** The loan approved are majorly of higher grade as they are of low risk thus low chance of defaulting. 60 month term loans have larger number of lower grade loans with high risk.

- **Sub Grade:** This provides more insight that the loans within grade are more skewed towards lowered sub grades.

Employment Length & Homeownership

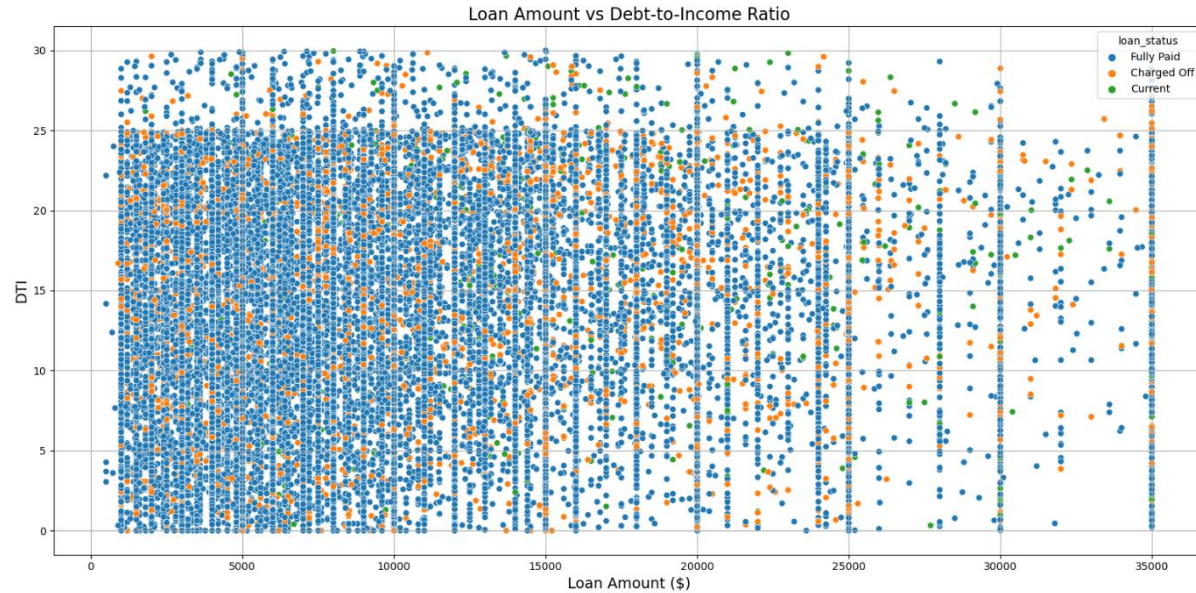


- **Employment Length:** Majority of clients have 10+ years of experience and has highest number of defaulted loan.



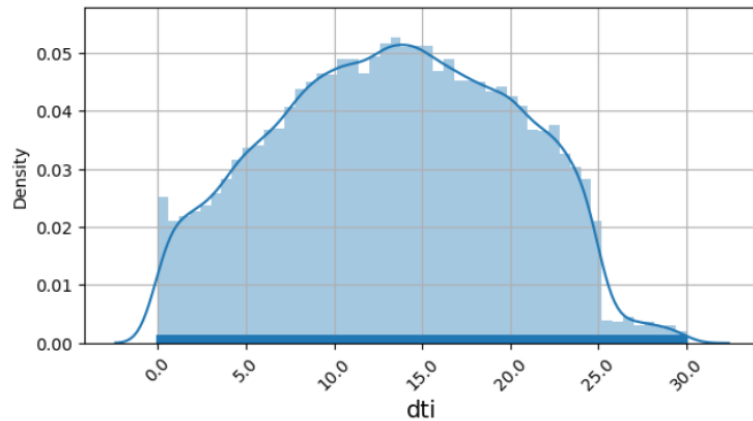
- **Home Ownership:** Majority of clients are lacking ownership of any property and are on rent or mortgage and have a higher chance of defaulting.

DTI & Loan status

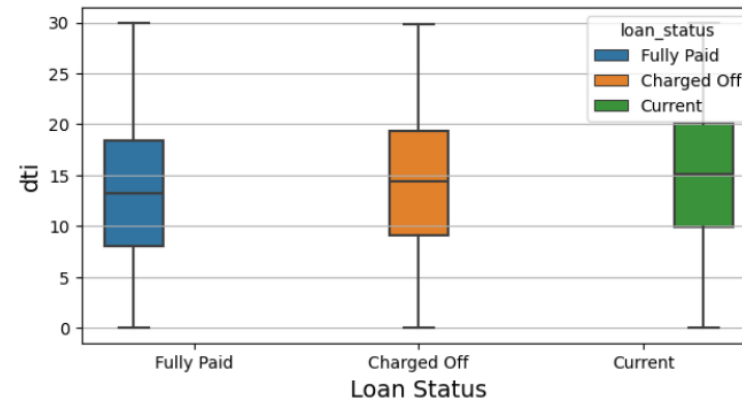


- **DTI:** The large percentage of Clients have a large Debt to Income ratio which shows that lending to such clients can be very risky.

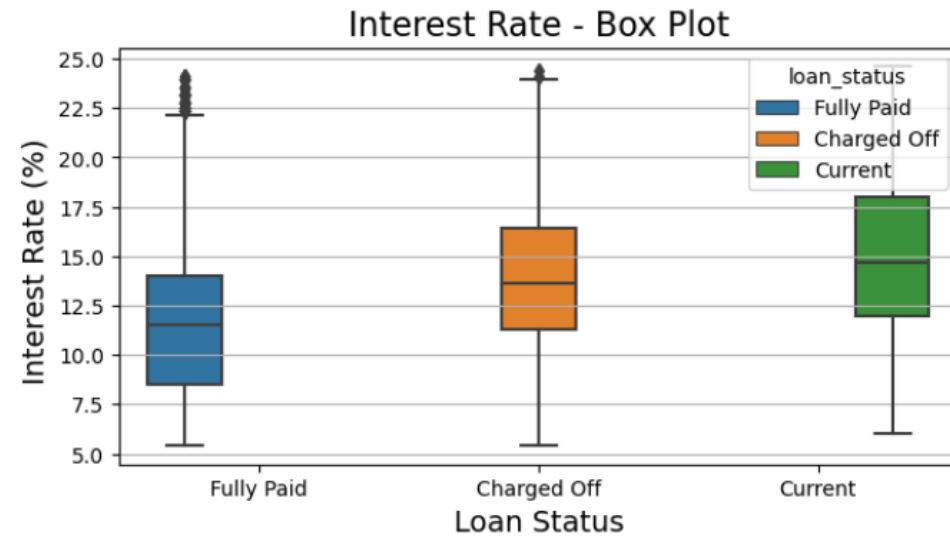
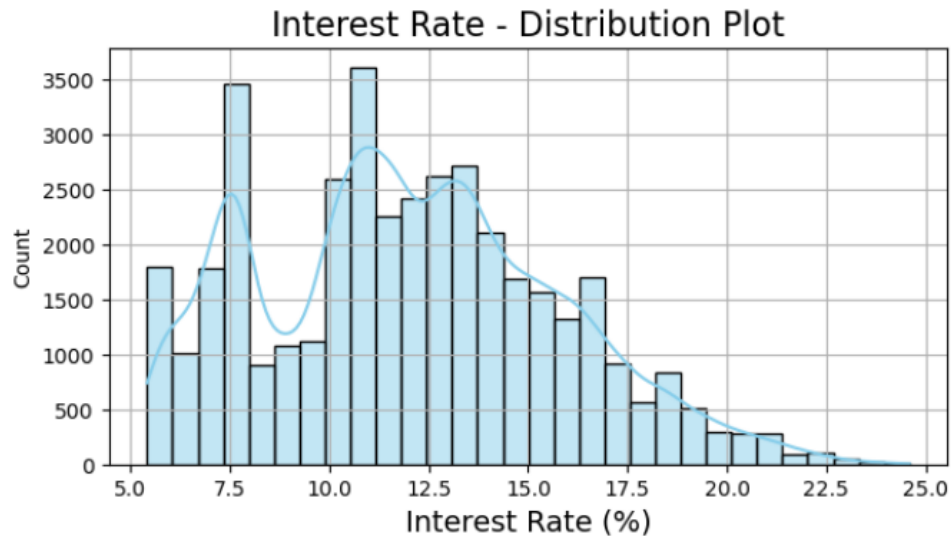
dti - Distribution Plot



dti - Box Plot



Interest Rate

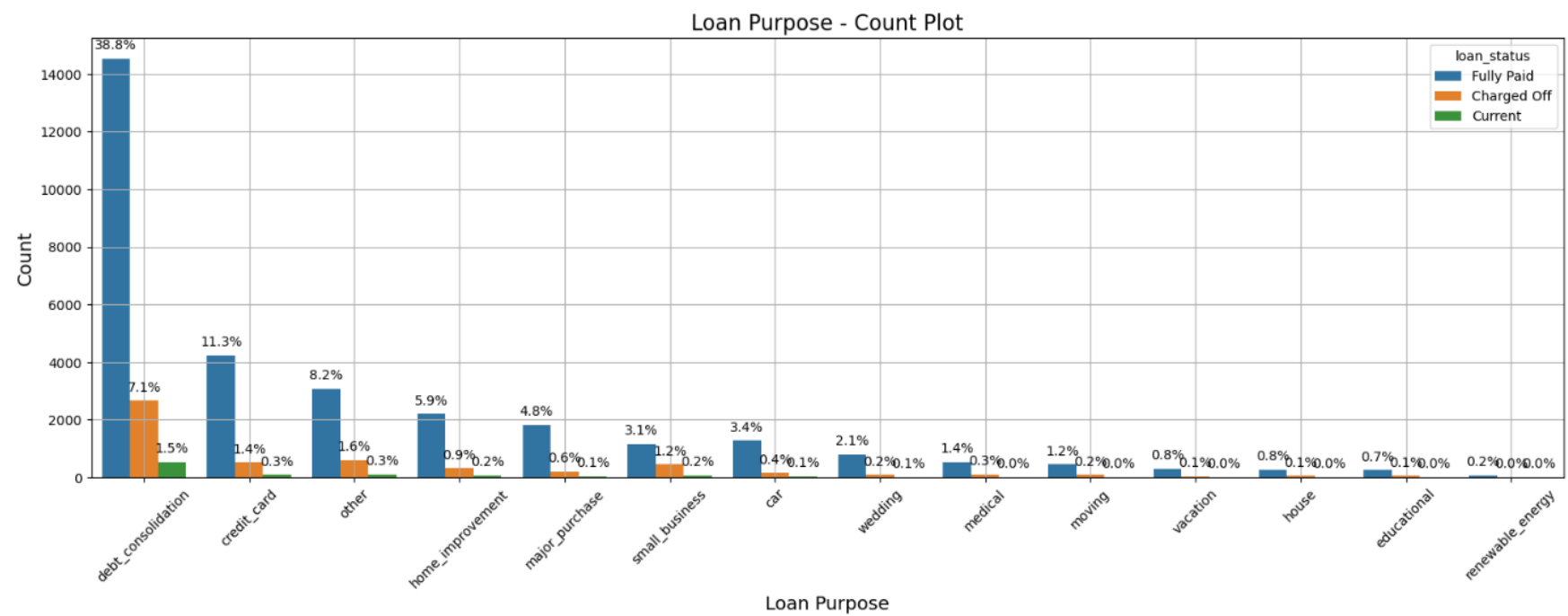


- **Interest Rate:** The count of loan taken varies with interest rate showing peak around in 5-15 bracket and decreasing slowly where as the chance of defaulting increases with interest rate.

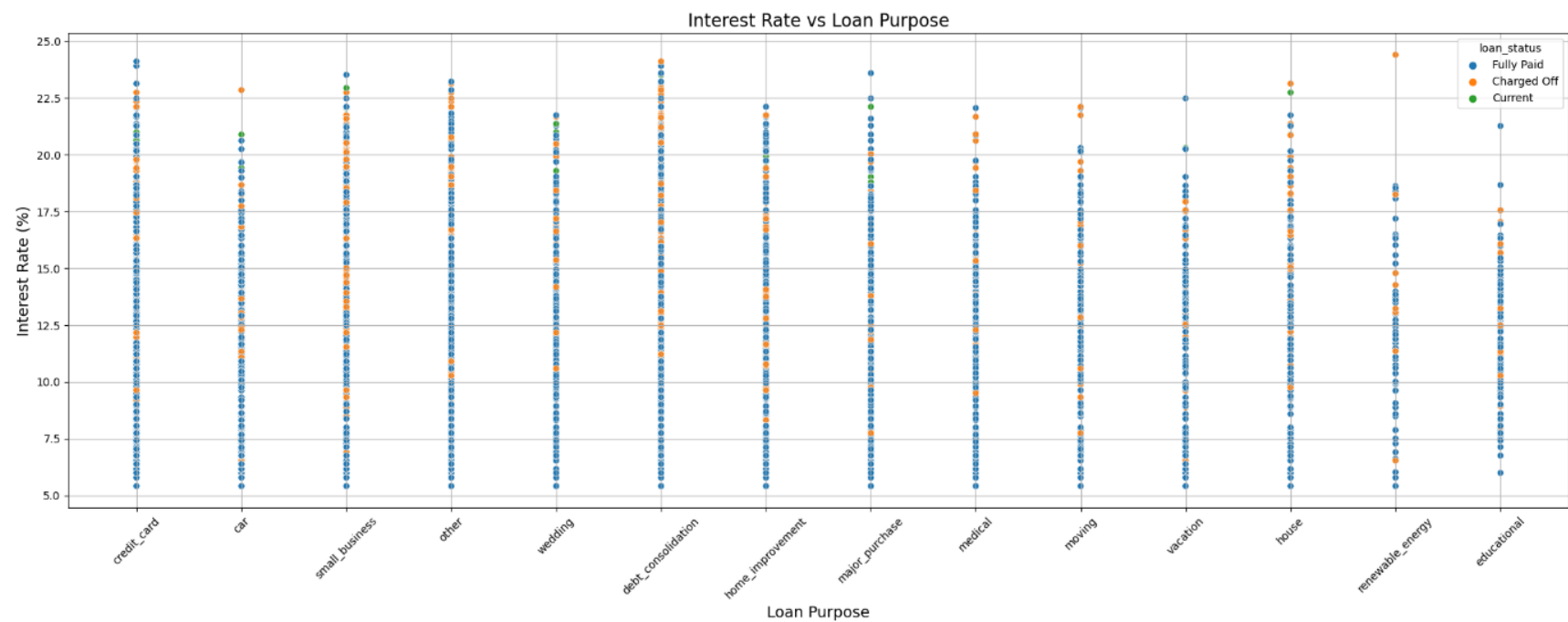
As interest rate increases from 14% number of borrowers are less.

Majority of the borrowers interest rate is between 9.25 to 14.59

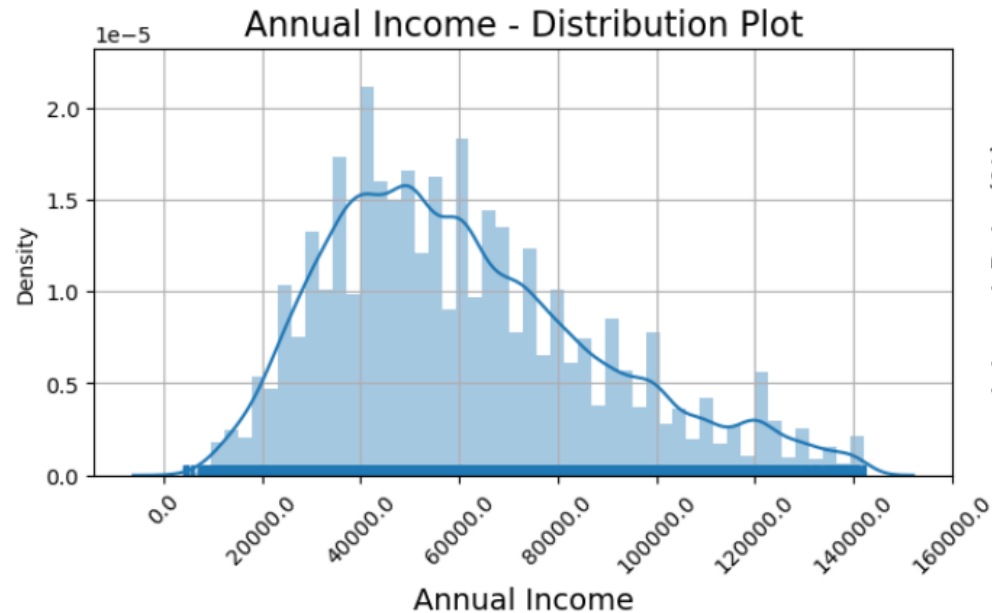
Loan Purpose



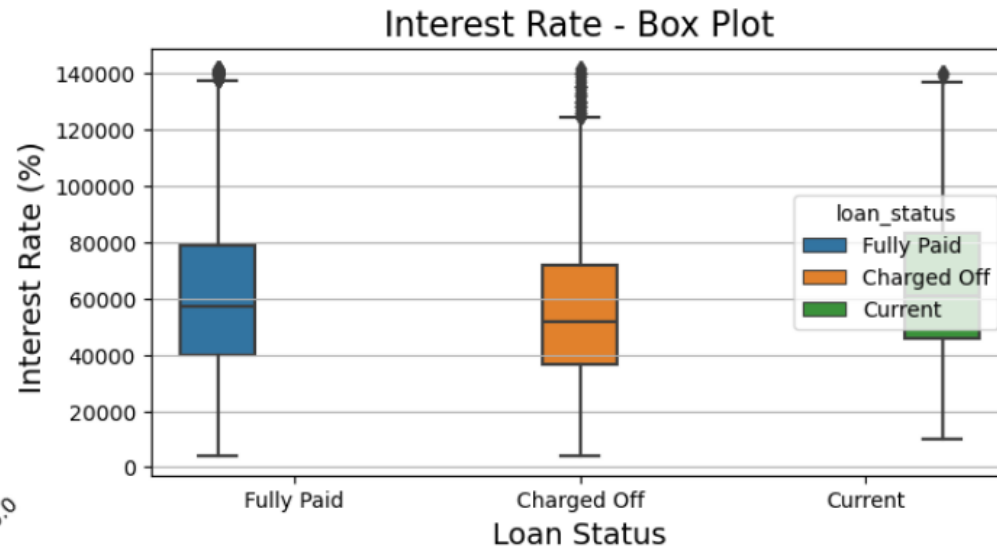
Interest Rate Vs Loan Purpose



Annual Income & Purpose

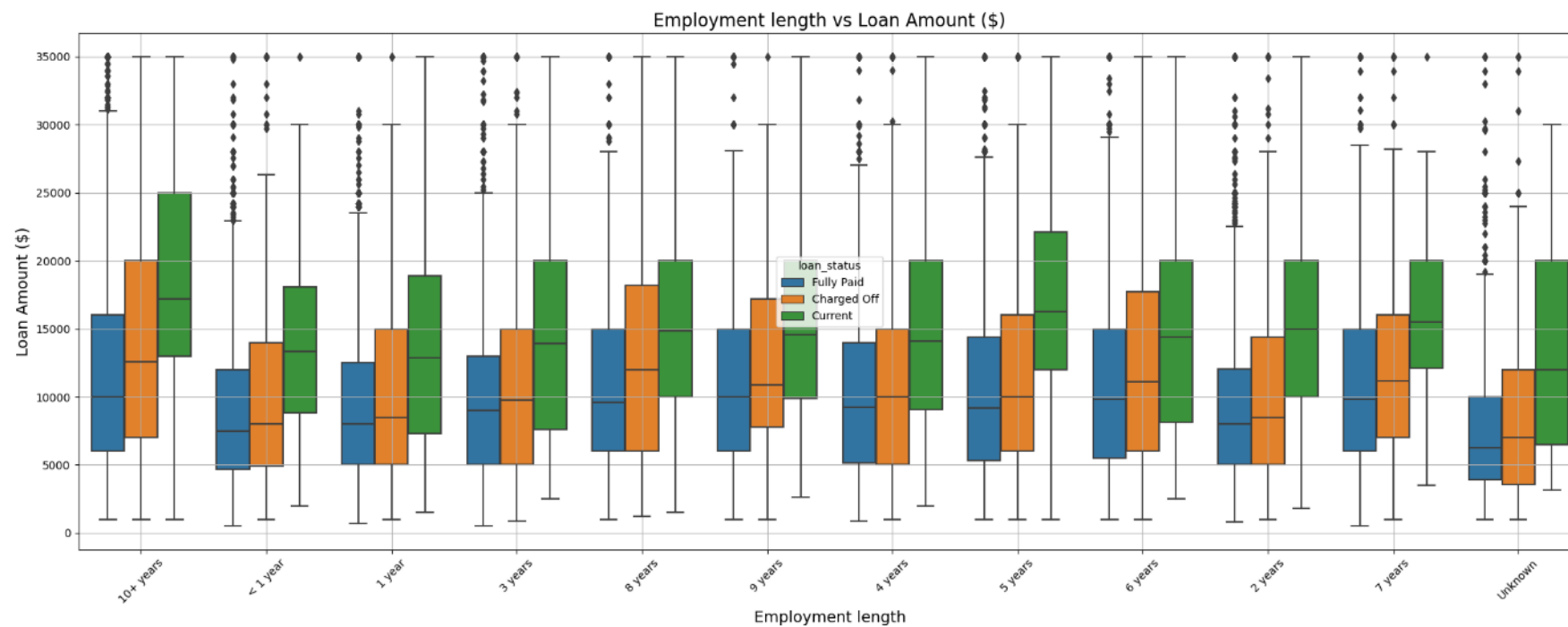


- **Annual Income :** The Majority of clients have low annual income compared to rest and income lower than 50k has higher chance of defaulting.

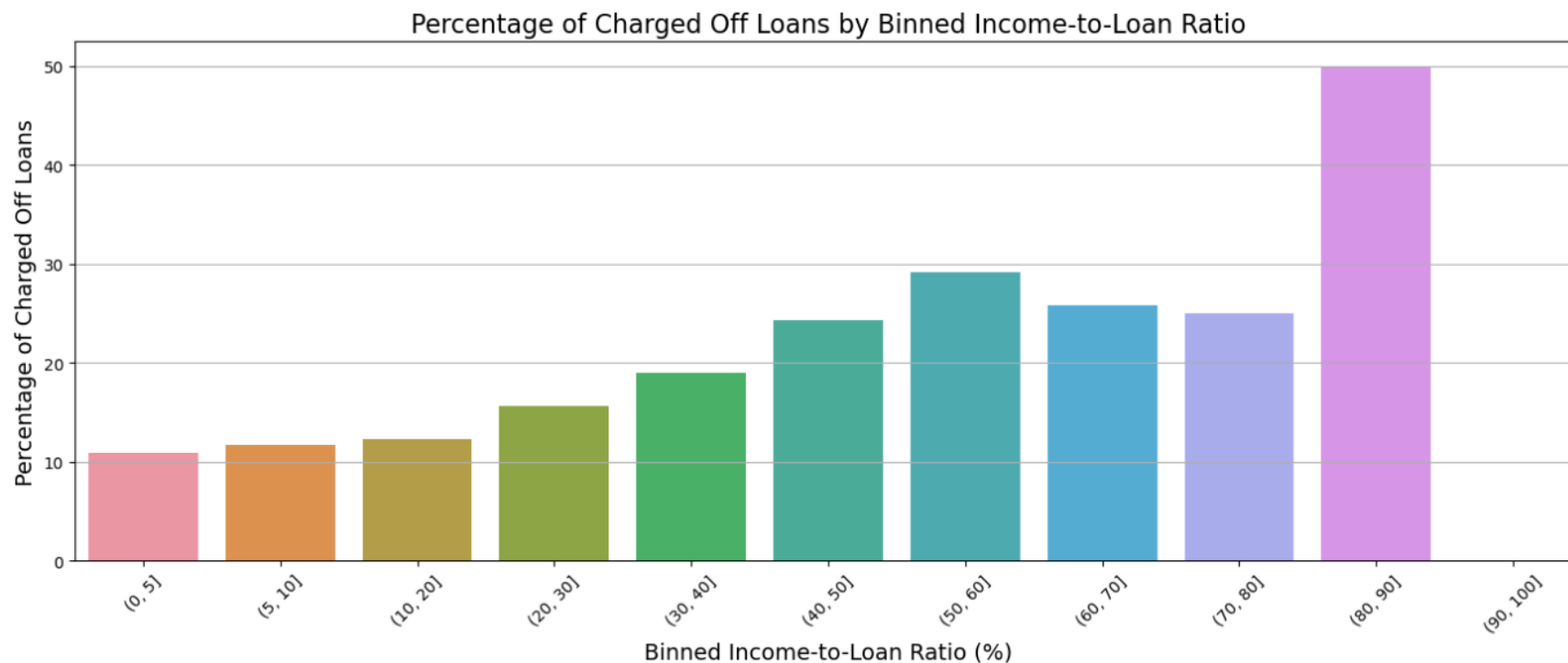


- **Purpose:** Loans are taken mostly for debt consolidation followed by credit card payment. Whereas the debt consolidation has highest fully paid loan but also has highest defaulted loans as well.

Employee Vs Loan Amount



Binned Income to Loan Ratio



Recommendations

Recommendations

Major Driving factor which can be used to predict the chance of defaulting and avoiding Credit Loss:

1. DTI
2. Grades
3. Verification Status
4. Annual income

Other considerations for 'defaults' :

1. Borrowers having annual income in the range 50000-100000.
2. Borrowers having Public Recorded Bankruptcy.
3. Borrowers with least grades like E,F,G which indicates high risk.
4. Borrowers with very high Debt to Income value.
5. Borrowers with working experience 10+ years.