

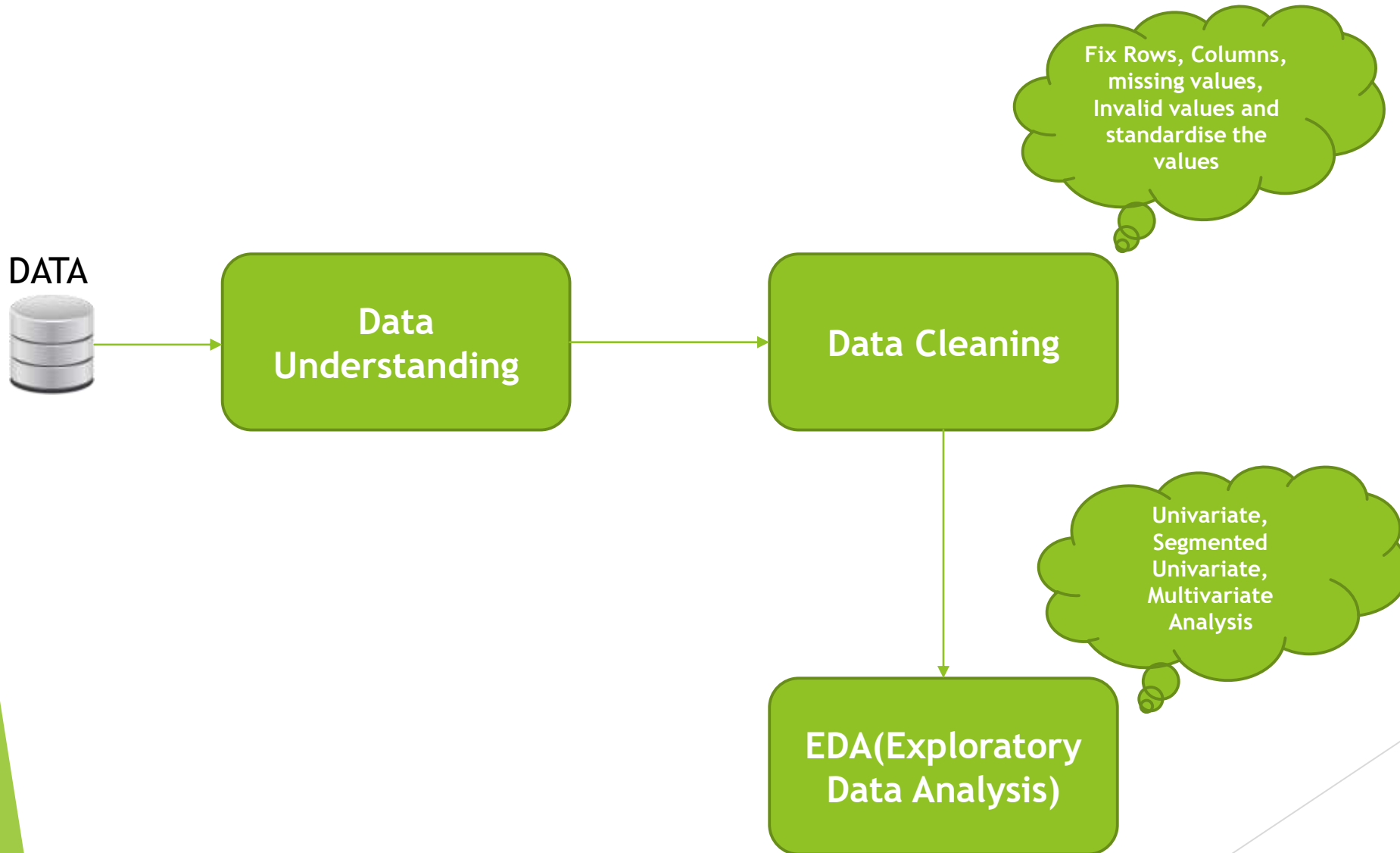
LENDING CLUB CASE STUDY

BY
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Problem Statement

- Lending club company is the largest online loan marketplace, facilitating personal loans, business loans, and financing of medical procedures. Borrowers can easily access lower interest rate loans through a fast online interface.
- the company wants to understand the risky loan applicants and **driving factors** behind loan default, i.e. the variables which are strong indicators of default. The company can utilize this knowledge for its portfolio and risk assessment.

ANALYSIS APPROACH



Data Cleaning

- **Delete columns:** Delete unnecessary columns.
- **Remove outliers:** Remove high and low values that would disproportionately affect the results of your analysis.
- **Missing values:** Treat missing values with appropriate approach.
- **Duplicate data:** Remove identical rows, remove rows where some columns are identical.
- **Filter rows:** Filter by segment, filter by date period to get only the rows relevant to the analysis.

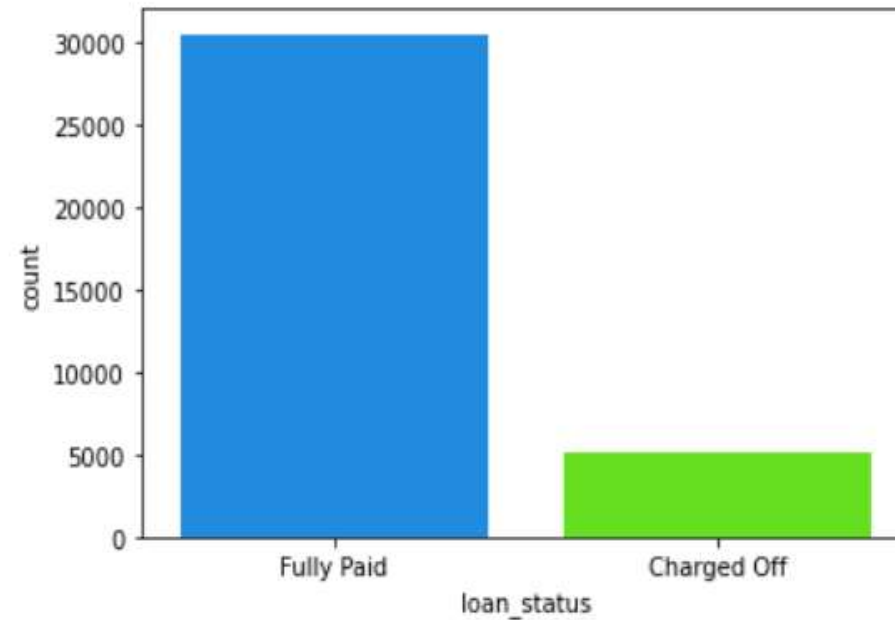
- The essence of the whole project is to analyze and understand how consumer and loan attributes are influencing to the tendency of defaulting.
- Performed **Data Cleaning** and prepared the dataset as required for the analysis:
 - Deleted the unnecessary columns which included null value columns, single value columns and columns which are not useful for analysis.
 - Created new columns for numeric continuous variables and date variables for getting more insights:
 - For Columns like Loan amount, annual income, interest rate, installments new categorical columns are created for more useful insights.
 - From the Issue Date column Year and Month are fetched separately for analysis.

Exploratory Data Analysis (EDA)

- **During Exploratory Data Analysis :**
 - Histograms and Bar charts to check out the distribution of all the driver variables.
 - Box plots to detect the Outliers.
 - Performed the Multivariate analysis to understand how different variables interact with each other.
 - For the Analysis only Defaulter's and Fully paid Loan data have been considered and so filtering the data.

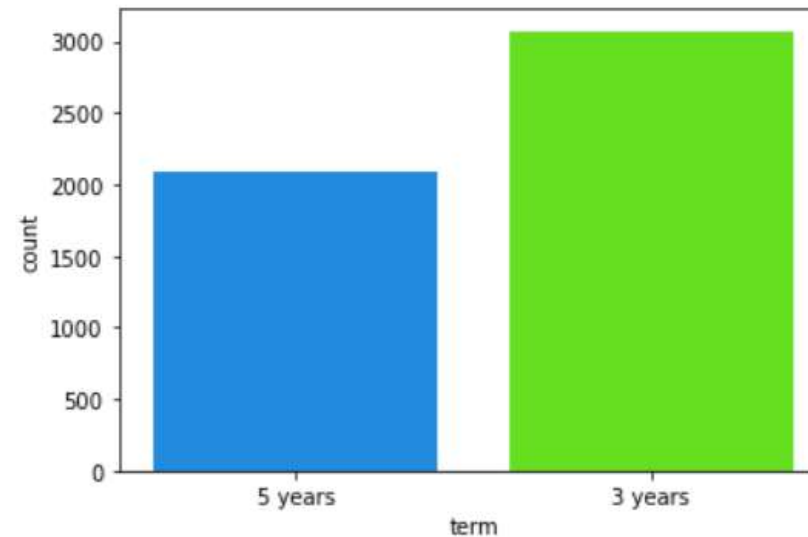
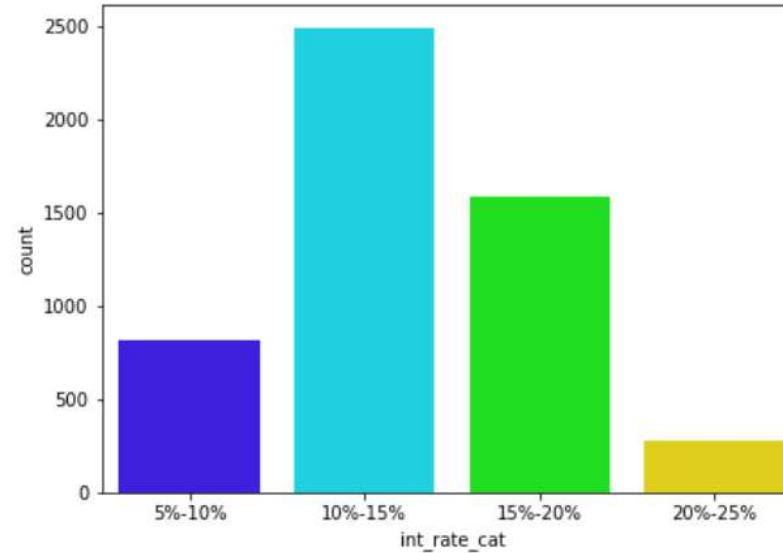
Analysis

- ▶ Most of the loans are Fully Paid.
- ▶ Around 14.5% of the loans are charged off which means are not paid and Defaulters.
- ▶ Our main goal is to focus on Defaulter's list.



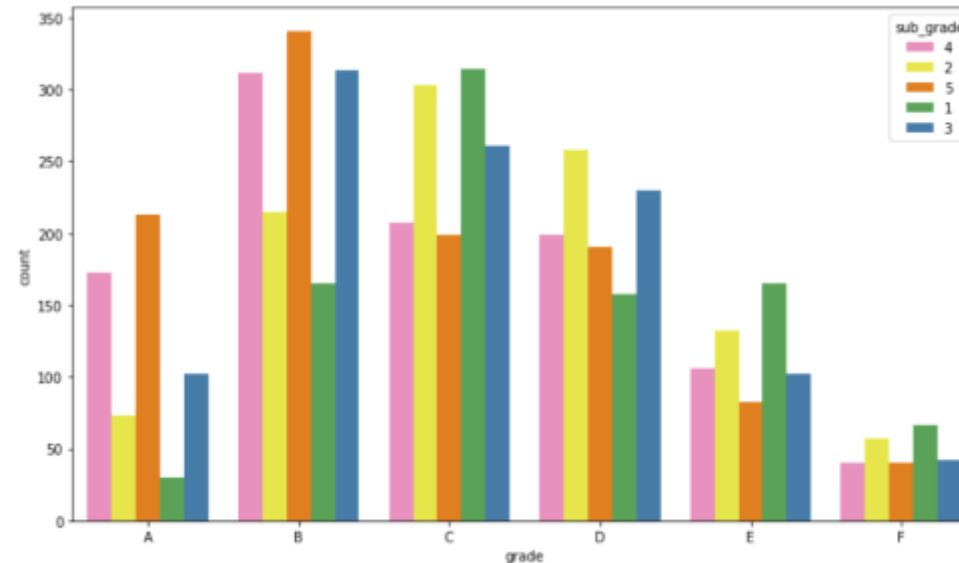
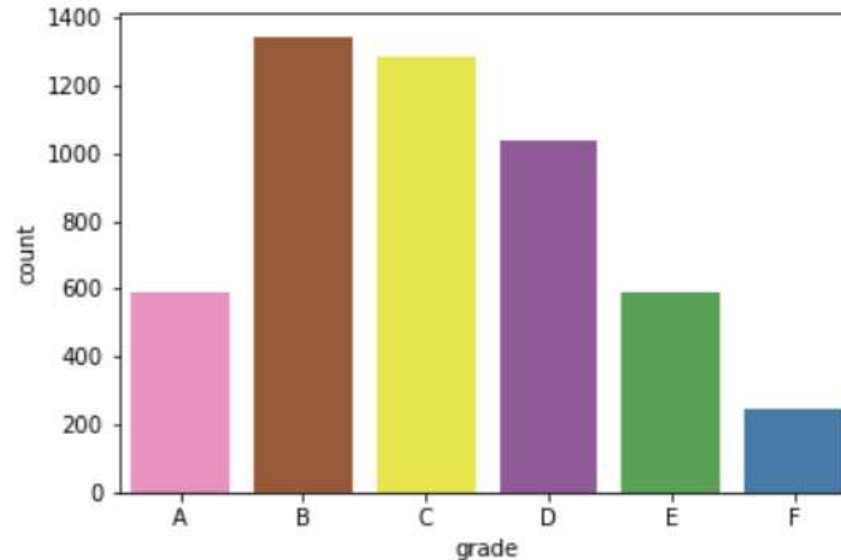
Analysis on Loan Term and Interest rate

- ▶ Here the applicants with loan term of 3 years are defaulters.
- ▶ Most Applicants fail to pay the loan if the term is 3 years(low) and end as defaulters.
- ▶ So as the loan is issued for less terms the defaulters increase.
- ▶ Loans with higher interest rates are the most probable to end in defaulters.
- ▶ Here loans with 10-15% are the most in defaulters.



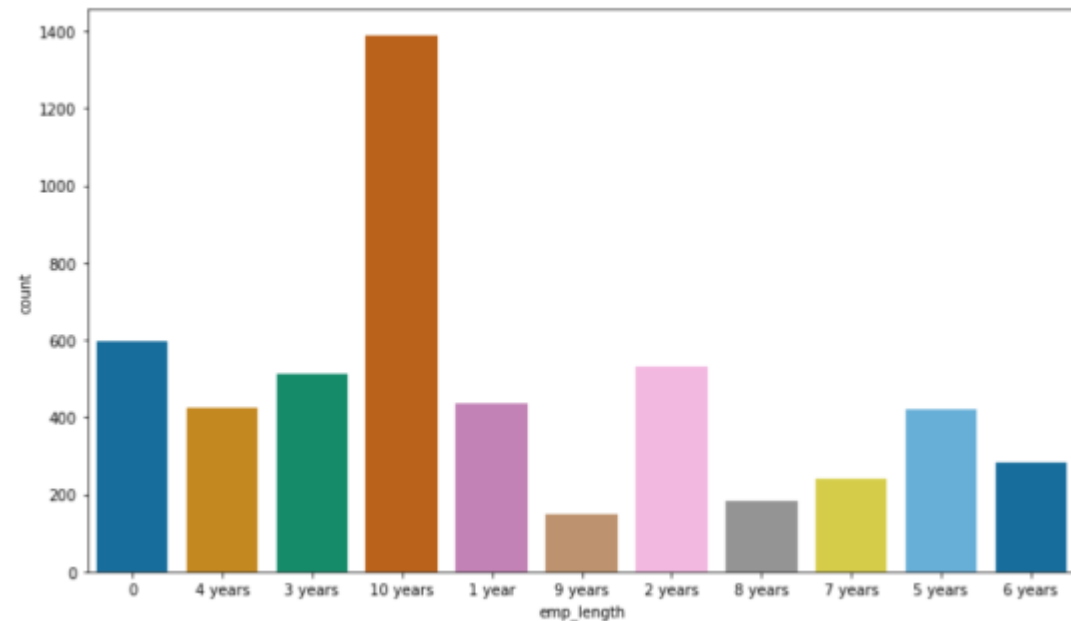
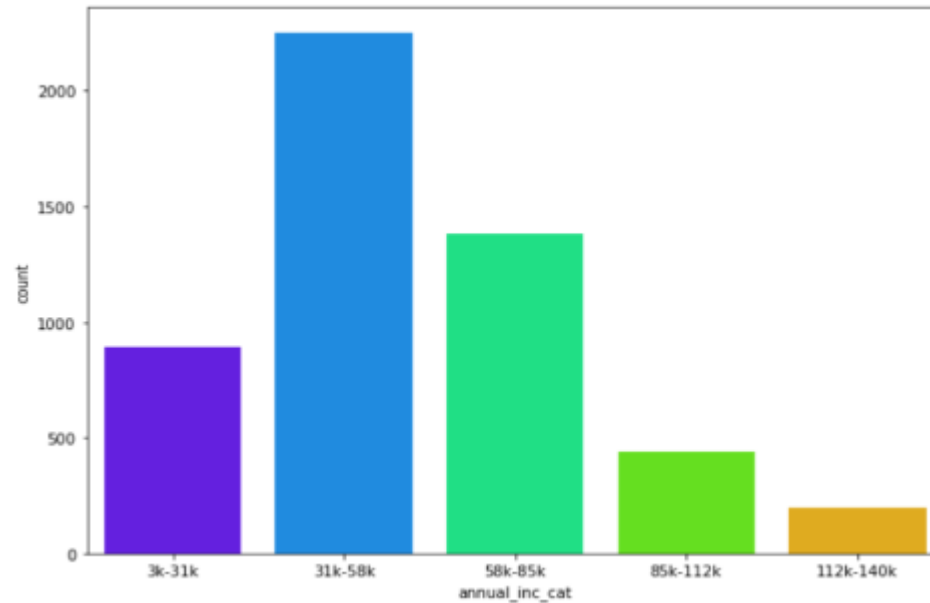
Analysis on Loan Grade

- ▶ Most of Defaulters are found with higher graded loans.
- ▶ As the loan grade decreases the number of defaulters also decrease.
- ▶ If more High graded loans are offered it may lead to increase in number of defaulters.
- ▶ Grade B has the most number of Defaulters.



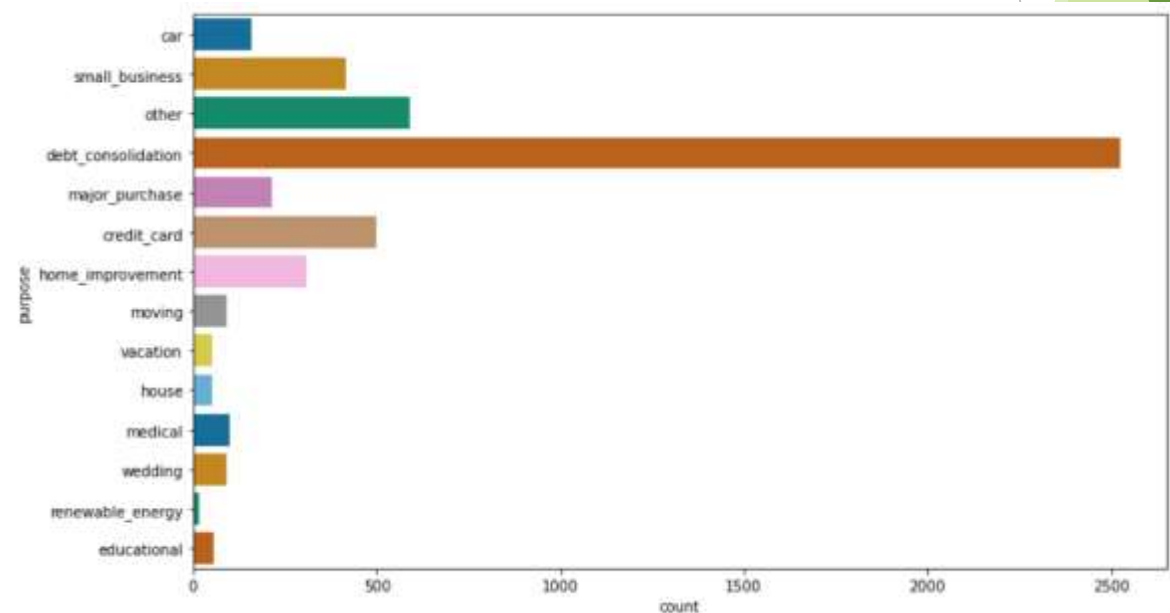
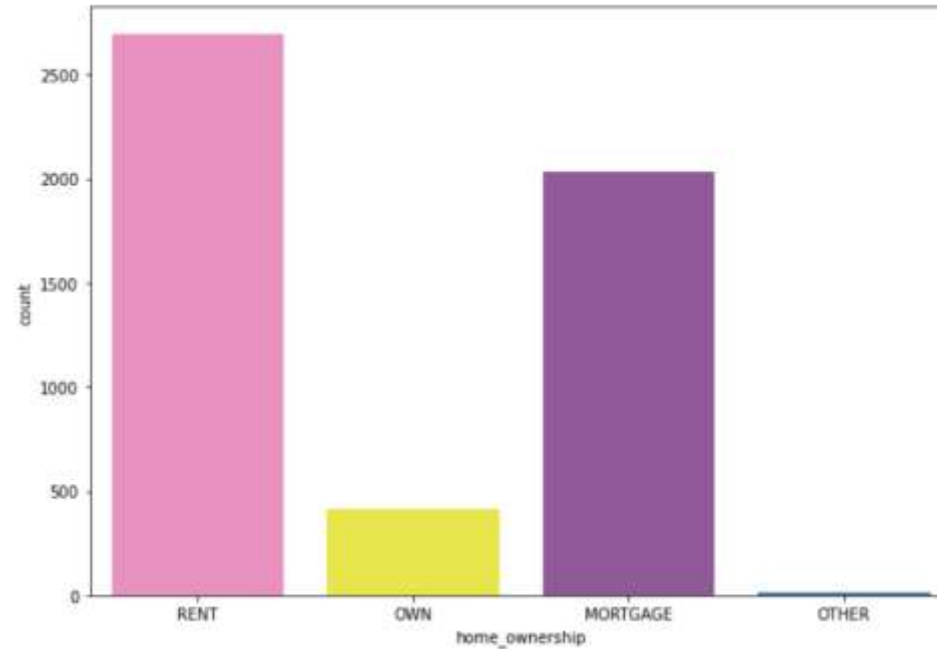
Analysis on Employment length and Ann. Income

- Based on analysis most of the defaulters are found to be of applicants who have been working for 10 or more years.
- Most probable defaulters can be applicants who have 10+ exp in work with annual income of 31k-85k.
- Club can decide thoroughly about providing loans for applicants with 10+ years of experience.



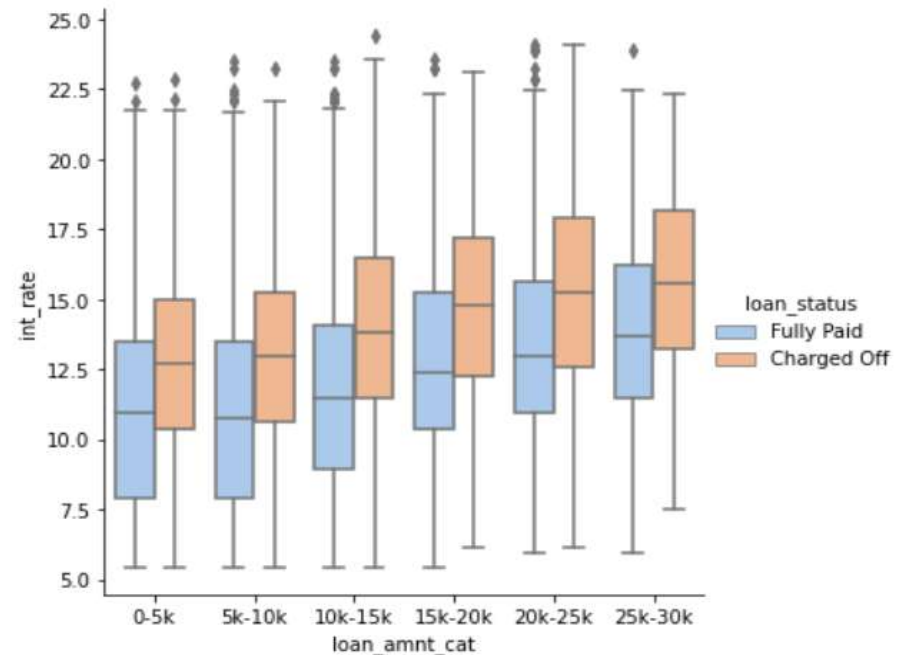
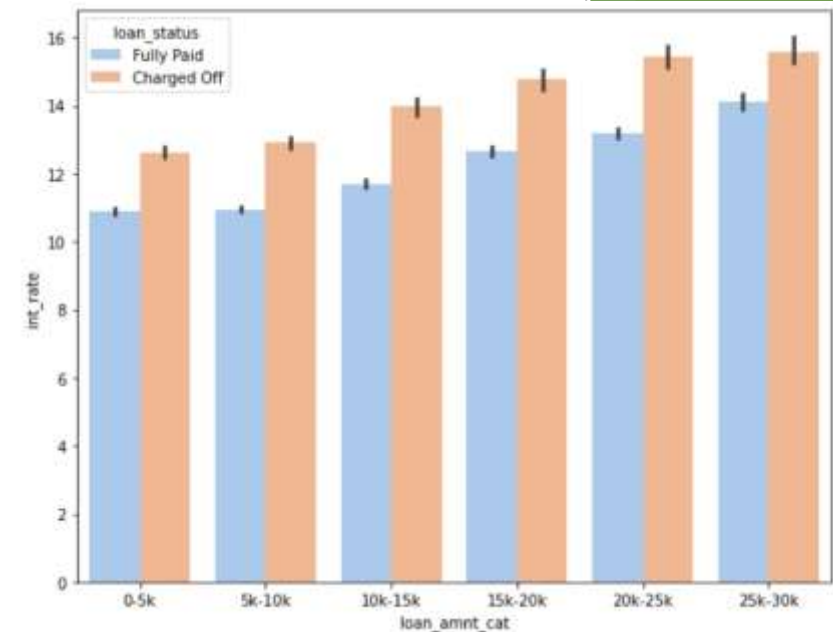
Analysis on House Ownership and Purpose of Loan

- ▶ Loans taken for consolidation of debts and are living in rented house are most probable to be defaulters.
- ▶ As you can see there is whooping increase in defaulters for the applicants who have borrowed loans for debt consolidation.
- ▶ As per analysis, can avoid offering loans for debt consolidation and rented house applicants which can probably decrease the number of defaulters.



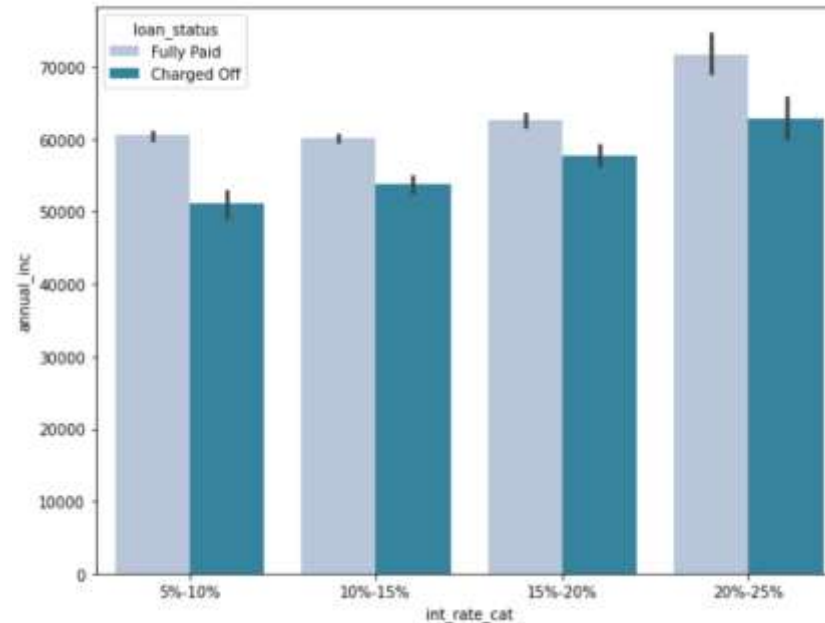
Loan Amount vs Interest rate

- ▶ Applicants with loan amount in range 25k-30k with interest rate of 15-16% are most probable to be defaulters.
- ▶ The interest rate for charged off loans is pretty high than that of fully paid loans in all the loan amount groups.
- ▶ This can be a pretty strong driving factor for loan defaulting.



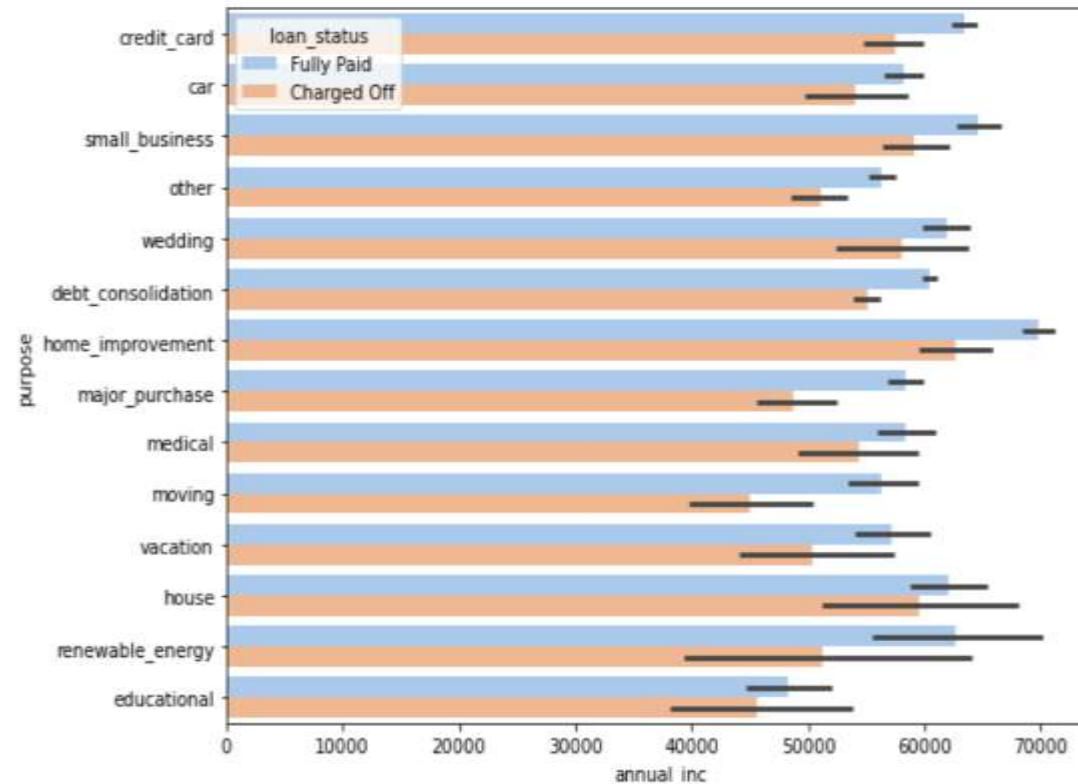
Interest rate vs Annual Income

- ▶ Applicants with annual income between 60-70k with 20-25% of interest rate on loan are most probable to be defaulters.
- ▶ Loans with high interest rate have more defaulters.



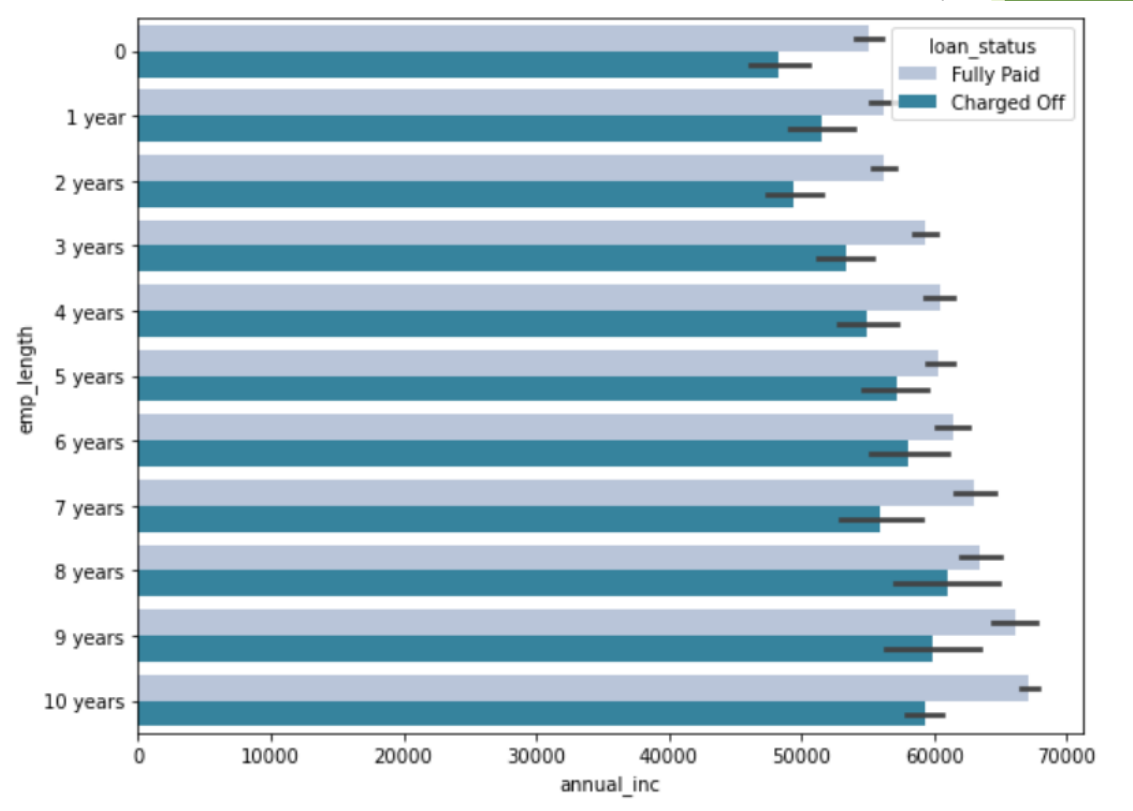
Annual Income vs Purpose

- ▶ Applicants with annual income between 60k-70k with loan purpose of Home Improvement are most probable to be defaulters.
- ▶ Applicants with higher salary mostly applied loans for "home improvement", "house", "renewable energy" and "small businesses"



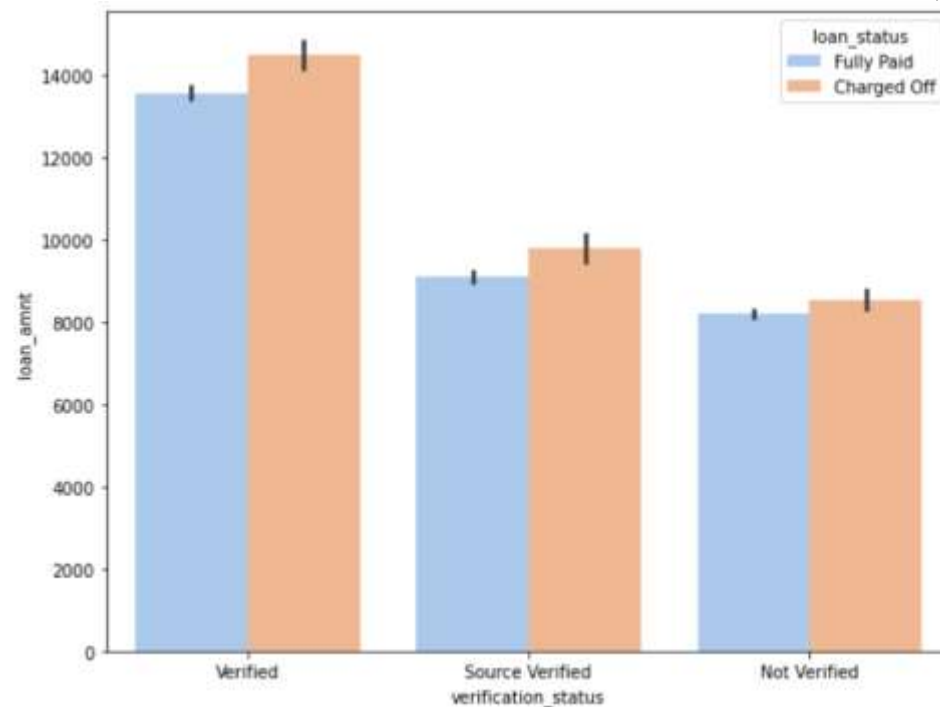
Annual Income vs Employment Length

- Applicants with annual income between 60k-70k with employment length of 8 years are most probable to be defaulters.



Loan Amount Vs Verification Status

- ▶ Applicants which are Verified with loan amount in range 14k-16k are most probable to be defaulters.
- ▶ People with the higher loan amount are being verified first.



Conclusion

- ▶ Loans having higher interest rate have more defaulters. Check the background of applicant thoroughly if interest rate is high.
- ▶ Most probable defaulters can be applicants who have 10+ experience. Check the background of applicant thoroughly if employment length is high.
- ▶ Most of the applicants with annual income between 60-70k are defaulters. This income can be tricky as it can suited for high graded as well low graded loans. Check the capability before offering loans.
- ▶ When the purpose of loan is debt consolidation check applicant thoroughly as it has high tendency to default.
- ▶ The interest rate for charged off loans is pretty high than that of fully paid loans in all the loan amount groups.
- ▶ When the applicants are living in a rented house, they have a high tendency to default. Lending club can avoid/reduce offering loans to such applicants