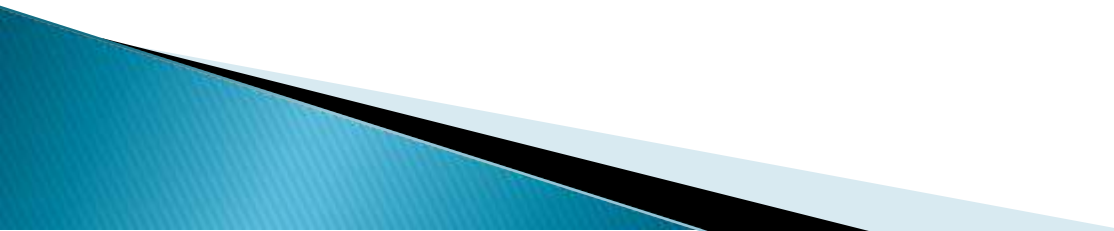


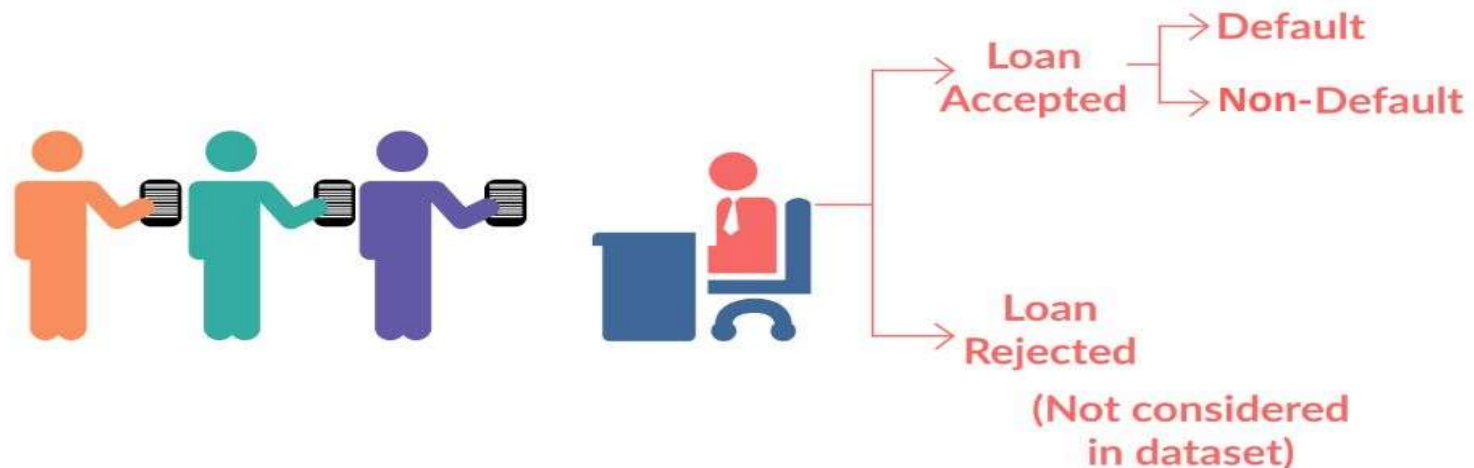
LENDING CLUB CASE STUDY

(Working for a consumer finance company which specialises in lending various types of loans to urban customers.)

Brief understanding about business problem:

1. Receives loan application. And make decision for loan approval based on the applicant's profile.
 - ▶ Two **types of risks** are associated with the bank's decision:
 - a). Likely to repay the loan, then not approving the loan results in a loss of business to the company.
 - b). 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
- 

- Aim is to identify patterns which indicate if a person is likely to default, which may be used for taking actions such as denying the loan, reducing the amount of loan, lending (to risky applicants) at a higher interest rate, etc.
- Identify the defaulted loan applicants.
- Use **EDA(Exploratory Data Analysis)** to understand how consumer attributes and loan attributes influence the tendency of default.



Two types of decisions to approve the loan:

1. Loan accepted: If the company approves the loan, there are 3 possible reasons.

Fully paid: Applicant has fully paid the loan (the principal and the interest rate)

Current: Applicant is in the process of paying the instalments, i.e. the tenure of the loan is not yet completed. These candidates are not labelled as 'defaulted'.

Charged-off: Applicant has not paid the instalments in due time for a long period of time, i.e. he/she has **defaulted** on the loan.

2. Loan rejected: Applicant does not meet their requirements etc.,

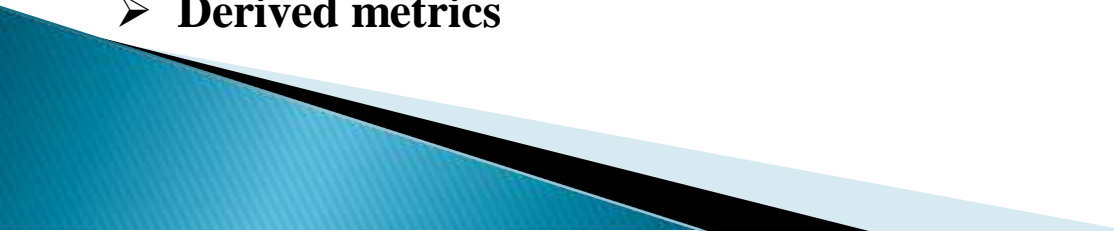
Business objective:

➤ Identify the risky loan applicants, then such loans can be reduced thereby cutting down the amount of credit loss by **Using EDA(Exploratory Data Analysis)**

➤ Find out the driving factors (variables) behind loan default, i.e. the variables which are strong indicators of default. The company can utilise this knowledge for its portfolio and risk assessment.

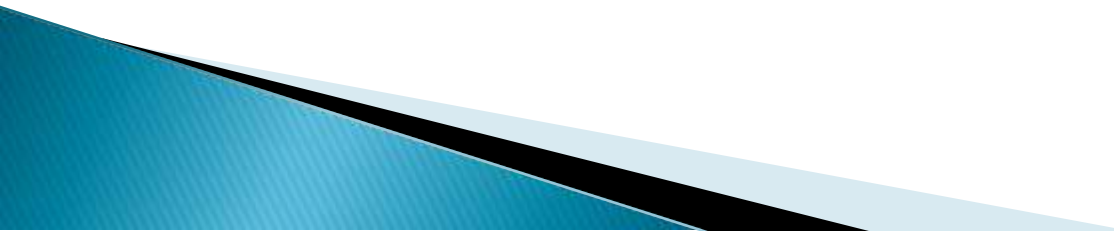
Following steps/ Procedure to find out the Business objective :

Use EDA(Exploratory Data Analysis)

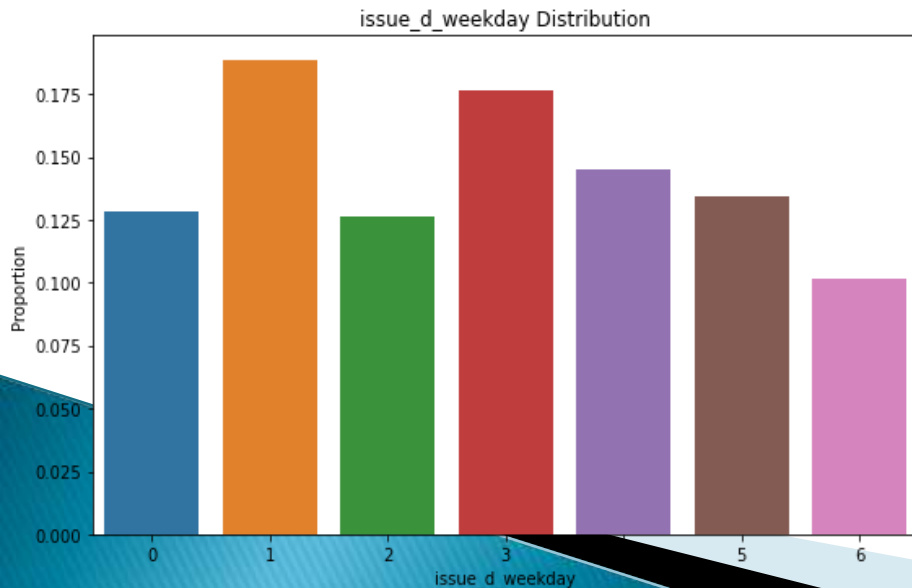
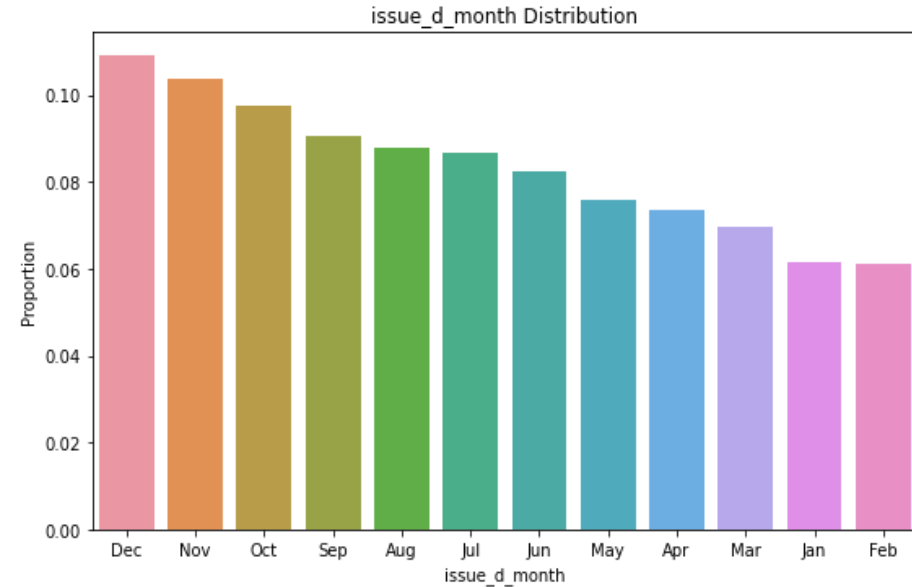
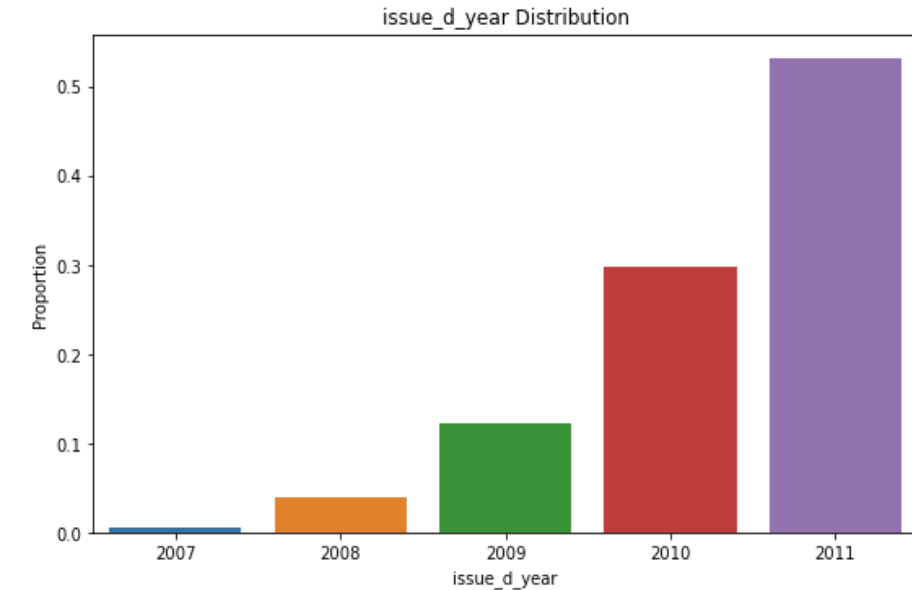
- **Data Sourcing:** Consumer finance company of loan data for all loans issued through the time period 2007 to 2011. (Data is Private data)
 - **Data Cleaning:** In data cleaning process, we will follow these below steps
 - a). Fix rows and columns
 - b). Fix missing values
 - c). Standardise values
 - d). Fix invalid values
 - e). Filter data
 - **Univariate Analysis**
 - **Segmented Univariate Analysis**
 - **Bivariate analysis**
 - **Derived metrics**
- 

Use EDA(Exploratory Data Analysis):

Data Cleaning:

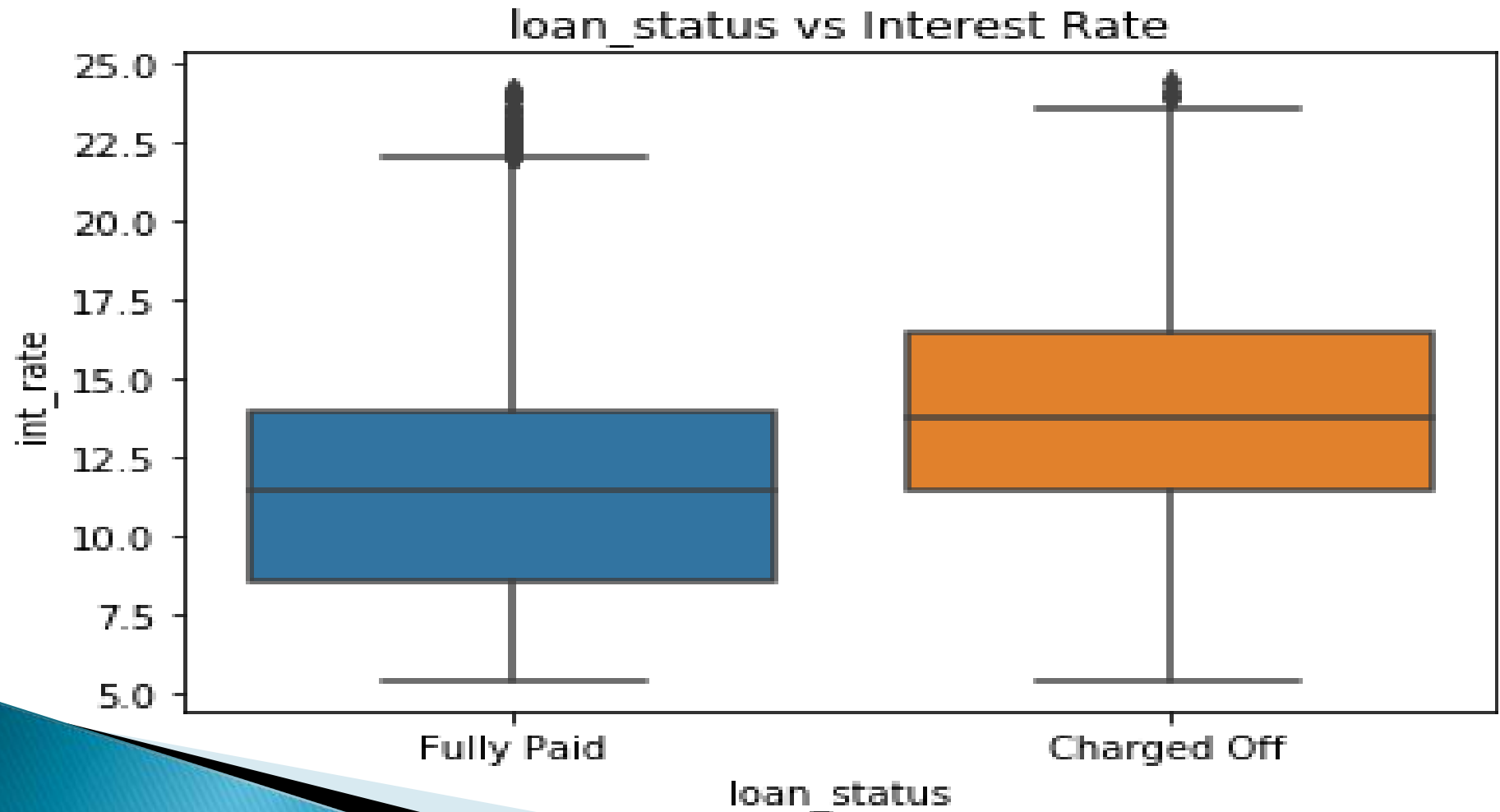
- First fix the rows and columns.
 - Then remove the null values in given dataset.
 - Some of the columns are single values, Those values did not contribute to the analysis.
 - Some of the columns are need for post approval of loan. But in this analysis we don't need those values/variables. Because in this analysis the main objective is find out charged off/defaulters.
 - We mainly focus on the column of loan_status. In that column we focus on charged-off and fully paid, we can't do analysis of current loan_status.
 - Standardizing the data
- 

Univariate Analysis: The lending club(LC) has doubling loan issues every year.
There are more issues of loan in last 3 months every end of the ear i.e., Oct, Nov and Dec.
LC has issued more loans on Tuesday and Wednesday than other week days.



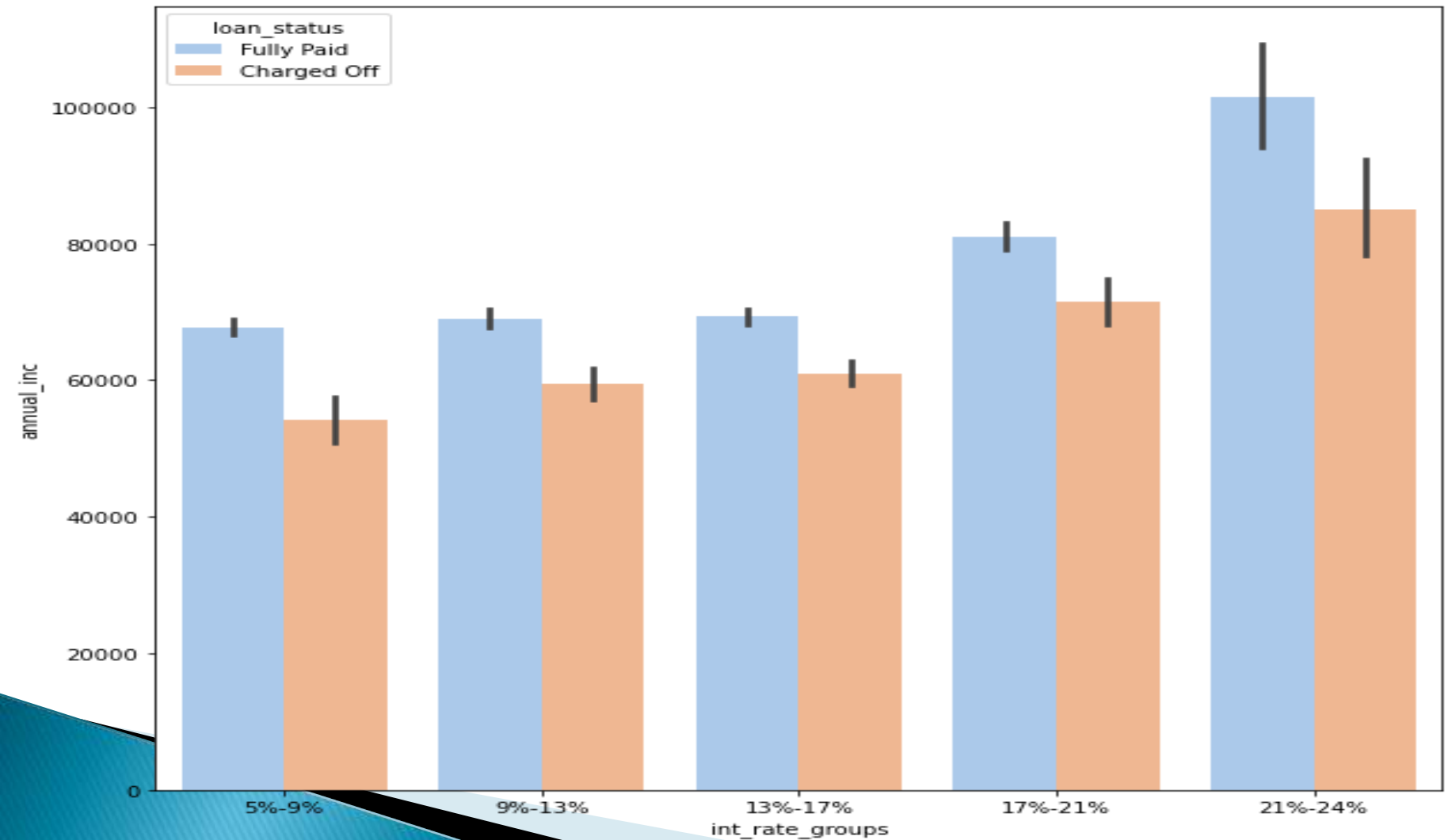
Segmented Univariate Analysis:

loan status vs. Interest Rates: This clearly tells us, grater the interest rate more the chance of Defaulting the loan.

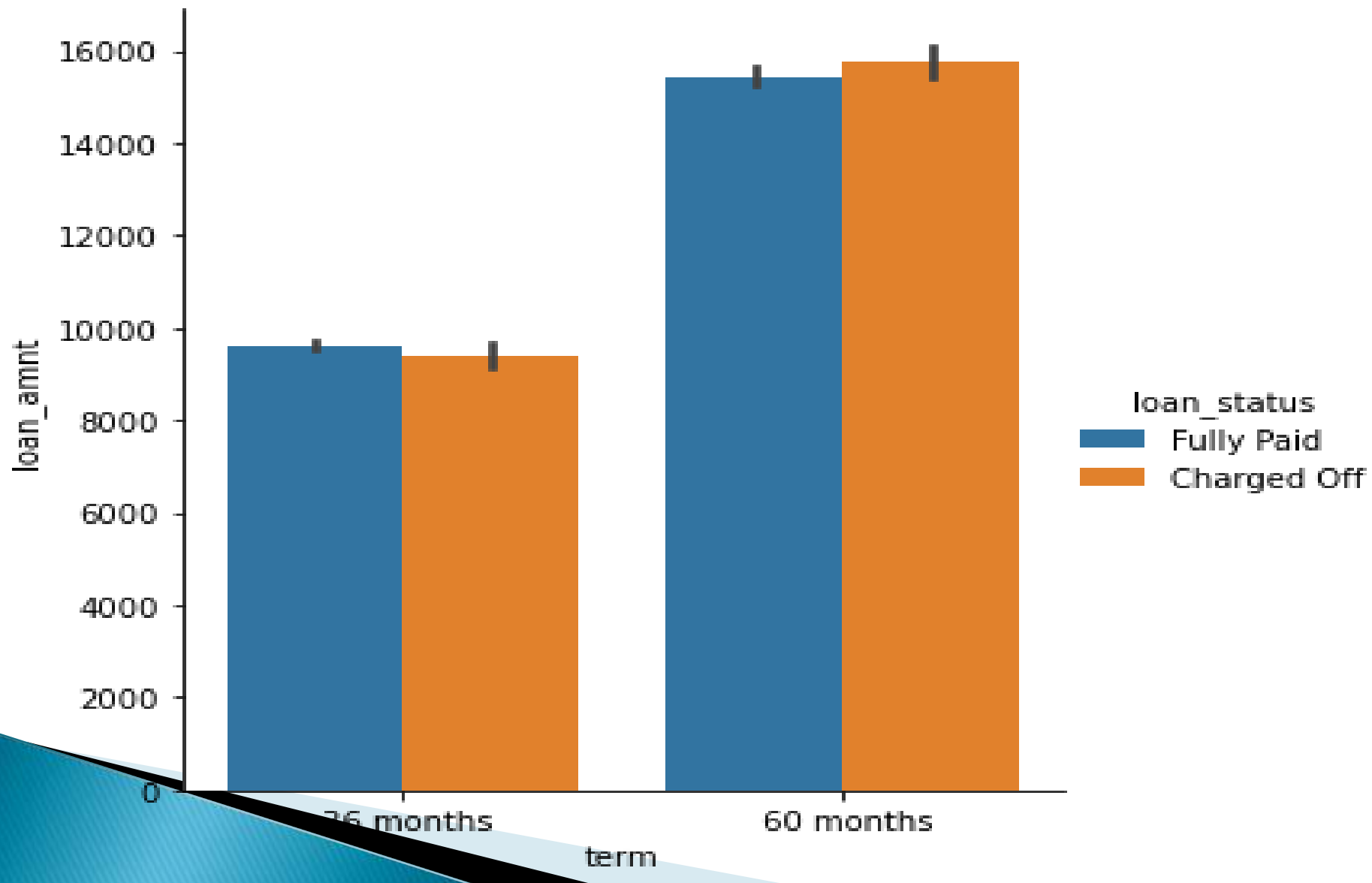


Bivariate Analysis:

Annual income vs. int_rate:



Term vs. loan_amnt



Observations/Conclusions:

Analysis with respect to the charged off loans. There is a more probability of defaulting when :

- Taking loan for 'home improvement' and have income of 60k -70k. And whose home ownership is 'MORTGAGE' and have income of 60-70k.
- Loan taken for high interest at the rate of 21-24% and have an income of 70k-80k. And taken a loan in the range 30k - 35k and are charged interest rate of 15-17.5 %.
- Loan for small business and the loan amount is greater than 14k.
- Borrowers whose home ownership is 'MORTGAGE' and have loan of 14-16k
- When grade is F and loan amount is between 15k-20k. And employment length is 10yrs and loan amount is 12k-14k.
- When the loan is verified and loan amount is above 16k. For grade G and interest rate above 20%