LENDING CLUB CASE STUDY

THE OBJECTIVE IS TO HELP THE INVESTORS TO MAKE RIGHT DECISION ON BORROWER'S TO LEND LOAN TO AVOID LOAN DEFAULT

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PROBLEM STATEMENT

Lending Club specializes in lending various types of loans to urban customers. When the company receives a loan application, the company has to make a decision for loan approval based on the applicant's profile.

Two types of risks are associated with the bank's decision:

● If the applicant is **likely to repay the loan**, then not approving the loan results in **a loss of business** to the company

● 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

BUSINESS OBJECTIVE

If the company approves the loan, there are 3 possible scenarios described below:

● 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

-Like most other lending companies, lending loans to 'risky' applicants is the largest source of financial loss (called credit loss).

The credit loss is the amount of money lost by the lender when the borrower refuses to pay or runs away with the money owed. In other words, borrowers who default cause the largest amount of loss to the lenders. In this case, the customers labelled as 'charged-off' are the 'defaulters'.

-Company wants to understand the 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.

Dataset after data cleaning

| S.No	Fields	Description
1	loan_amnt	Loan applied amount
2	funded_amnt_inv	Loan Sanctioned
3	installment	EMI Amount
4	grade	Assigned based on risk
5	sub_grade	Assigned based on sub-category on risk
6	home_ownership	Borrower's Home Status
7	verification_status	Income of borrowers are verified or not
8	loan_status	Status of loan
9	purpose	Purpose of loan
10	dti	A ratio calculated using the borrower's total monthly debt payments on the total debt obligations, excluding mortgage and the requested LC loan, divided by the
11	total_pymnt_inv	Payments received to date for portion of total amount funded by investors
12	term_in_months	The number of payments on the loan. Values are in months and can be either 36 or 60.
13	issue_month	Loan issued Month
14	issue_year	Loan issued year
15	emp_length_years	Employment length in years. Possible values are between 0 and 10 where 0 means less than one year and 10 means ten or more years.
16	int_rate_percentage	Interest Percentage of loan
17	annual_inc_thousands	The self-reported annual income provided by the borrower during registration.

Univariate Analysis

The loan amount varies from 0 to 35,000 having mean of 10,000
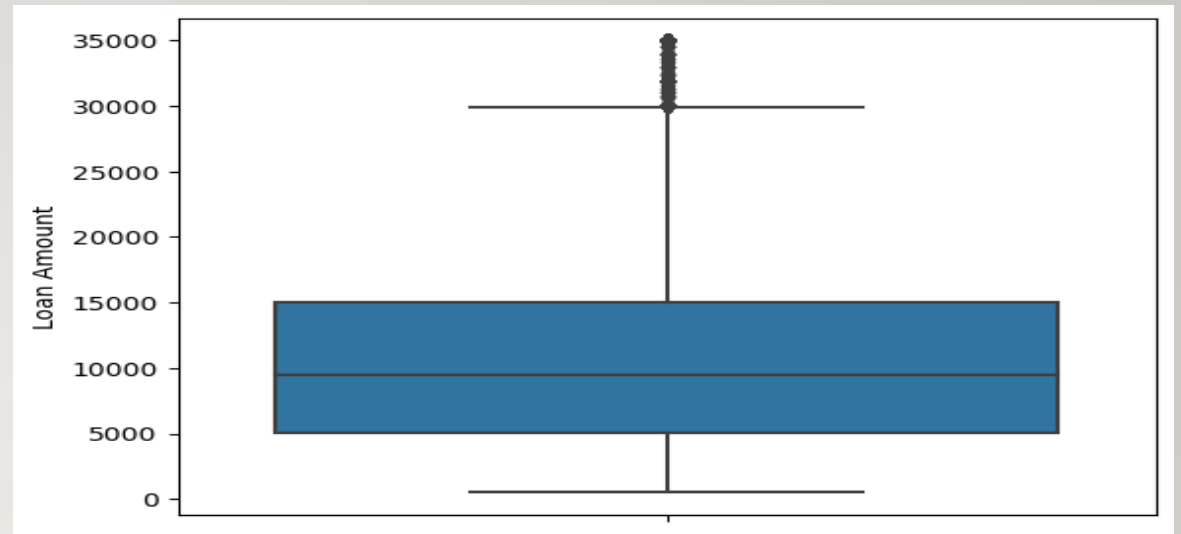
**Grade moves from A to G as mean value of interest rate increases**
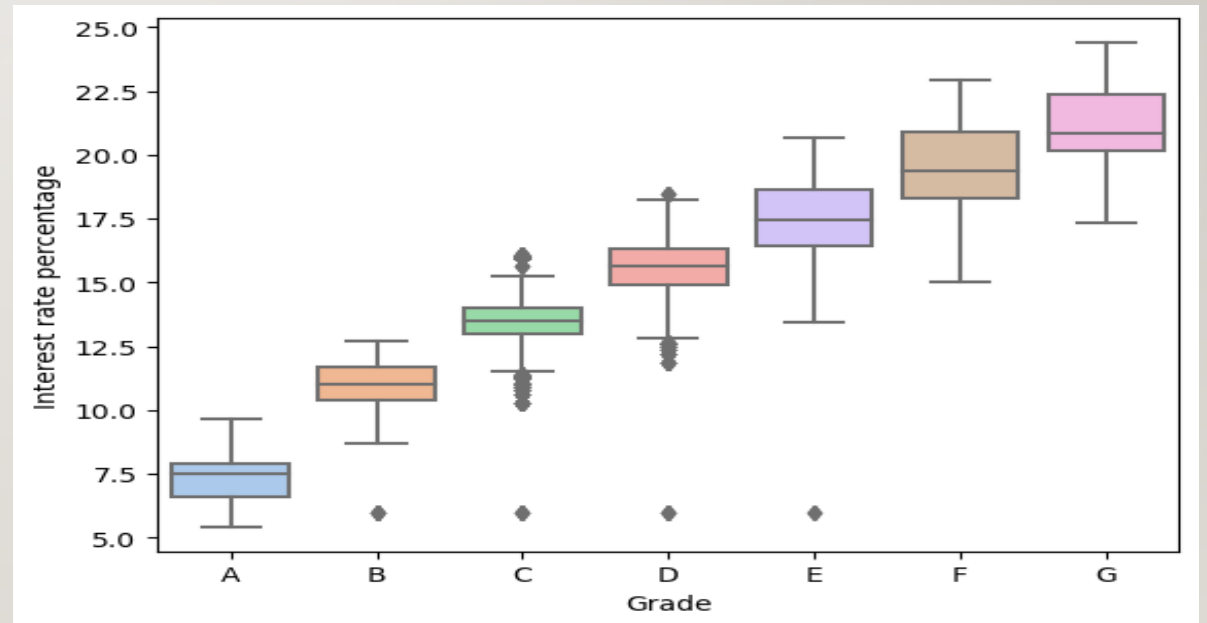
- *People with own house have least chances of being defaulters compare with Borrowers in rental home have highest chances of being defaulter.*
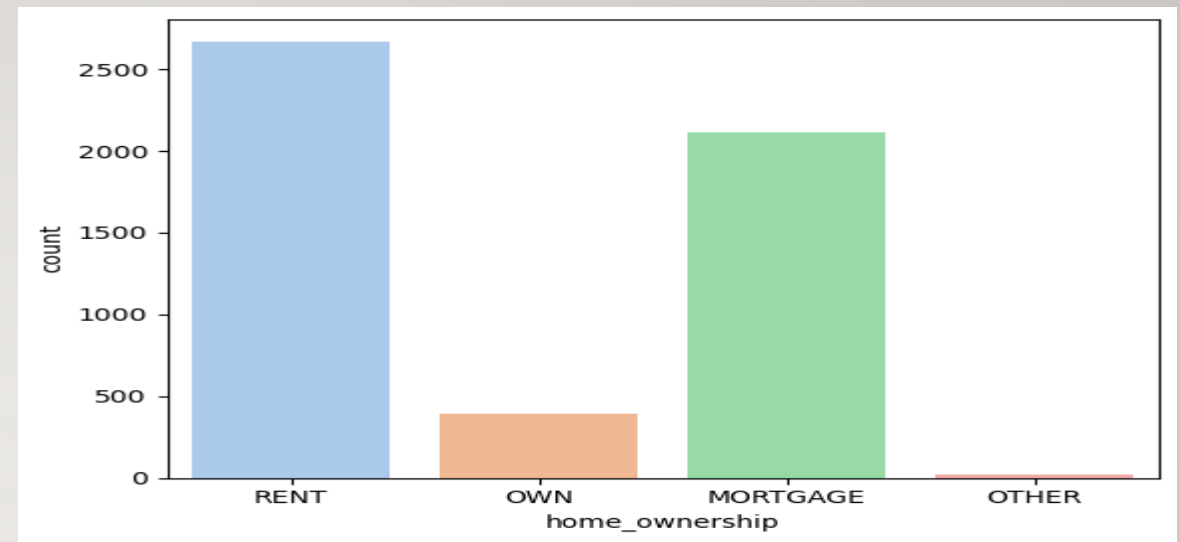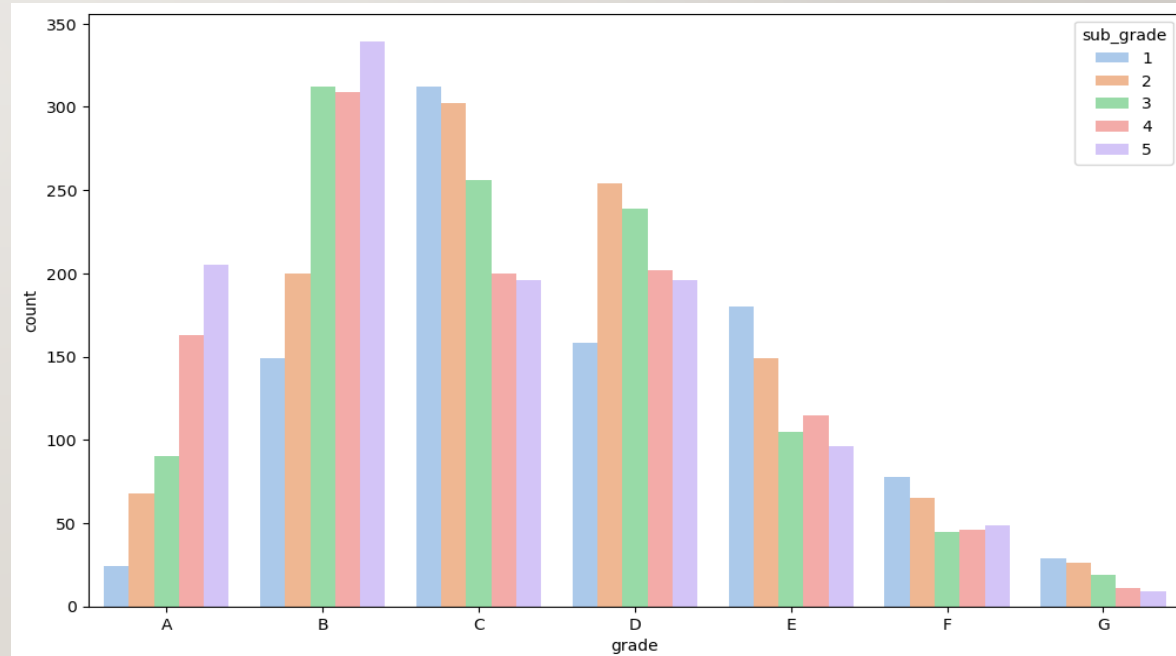
- *Maximum number of defaults occurred when the loan was sanctioned/issued in Dec. Loan issued in the year 2011 is also compared to other years and have maximum number of defaulters.*
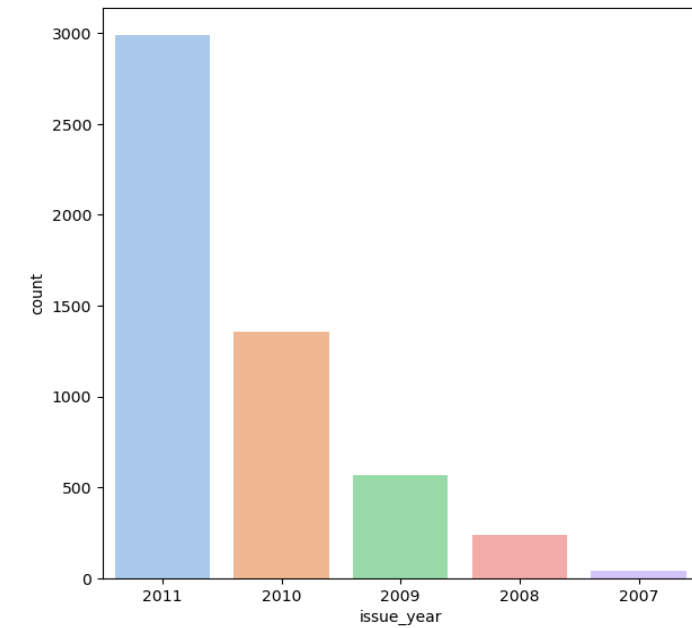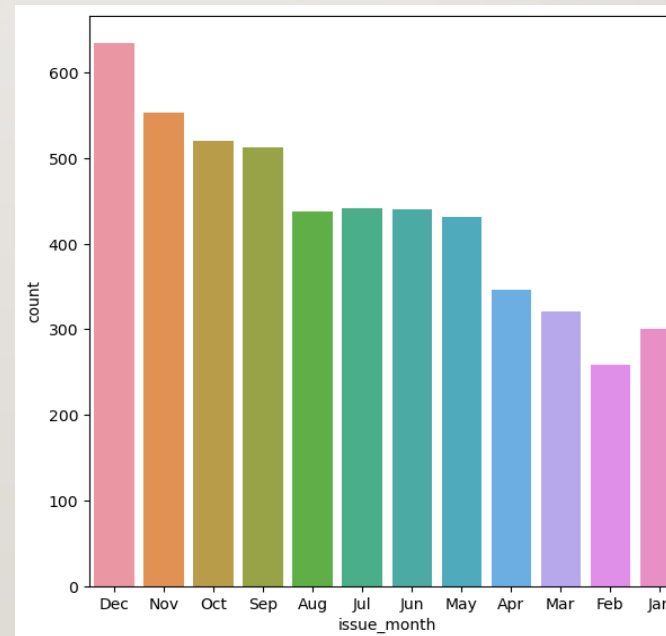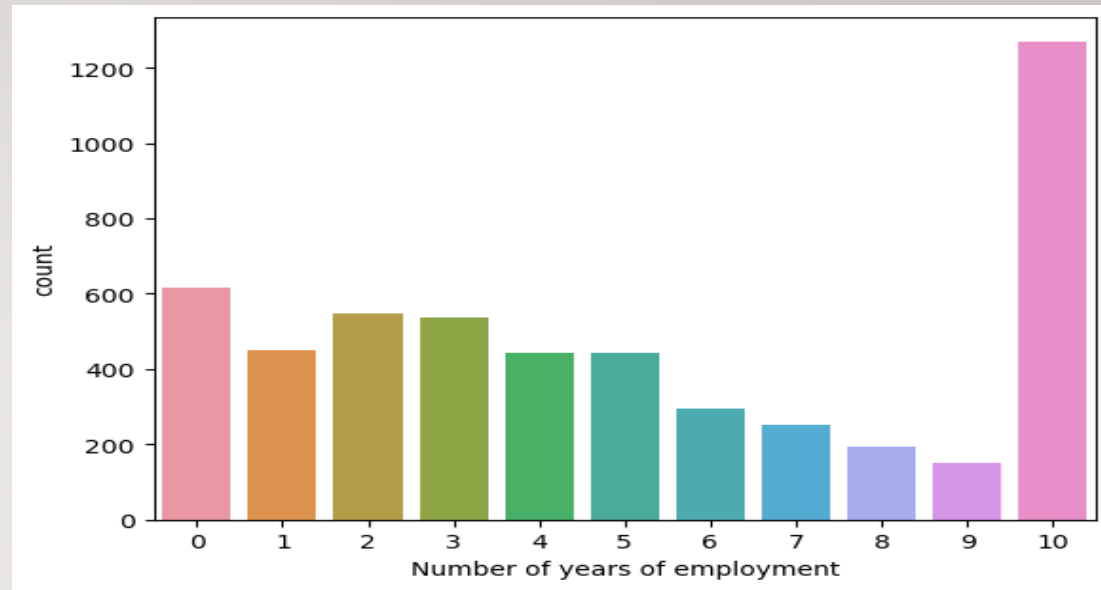
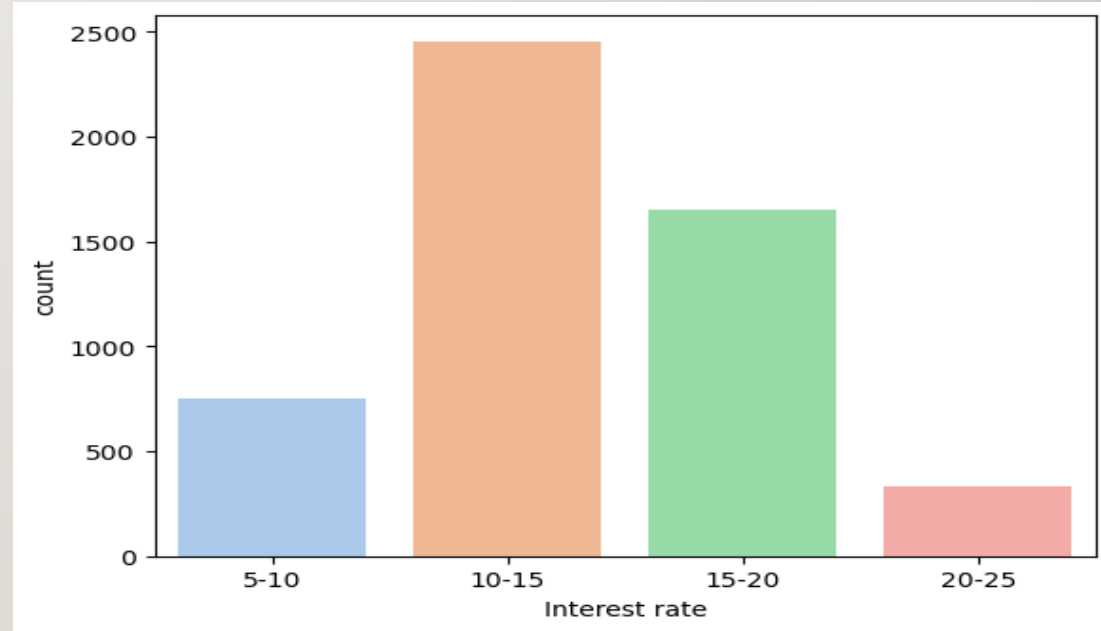- *People with 36 months as loan term tend to default at higher frequency.*
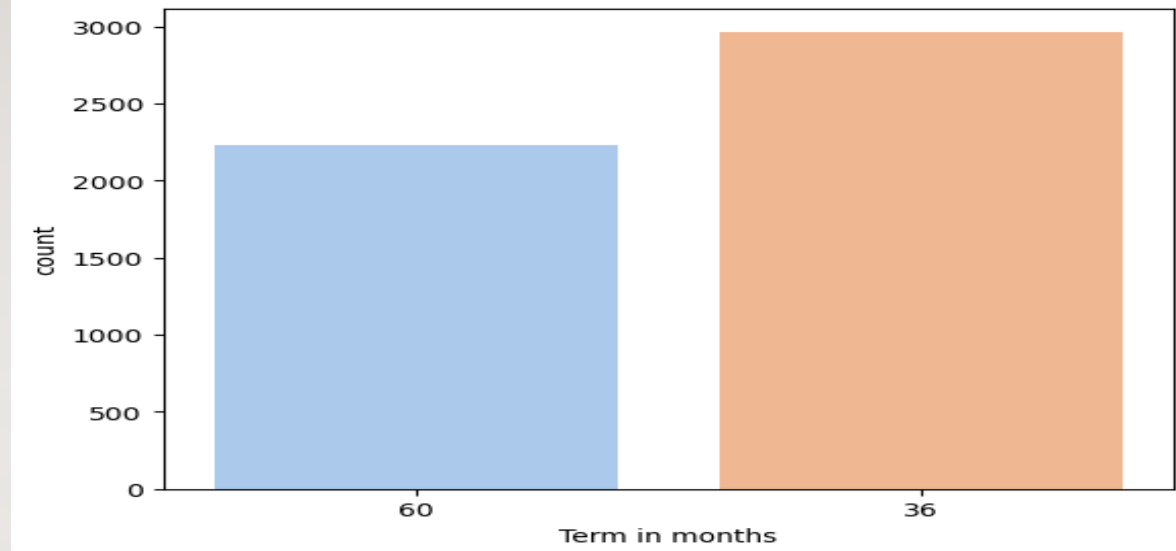
- *Grade B5 has highest number of defaults*

- *The person with 10+ years of experience have higher chances of loan defaulters.*
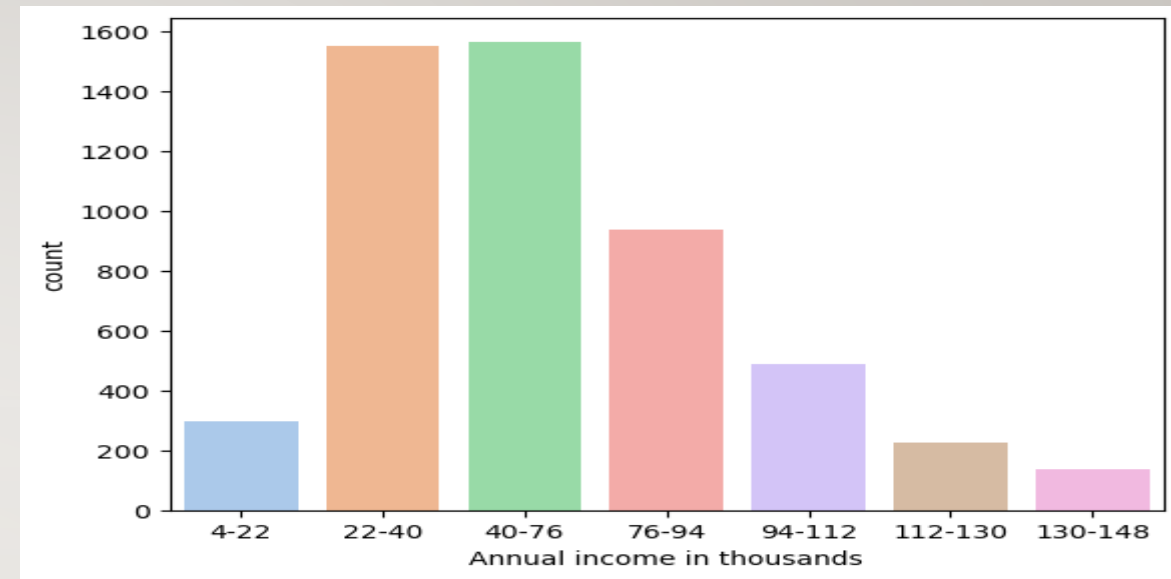

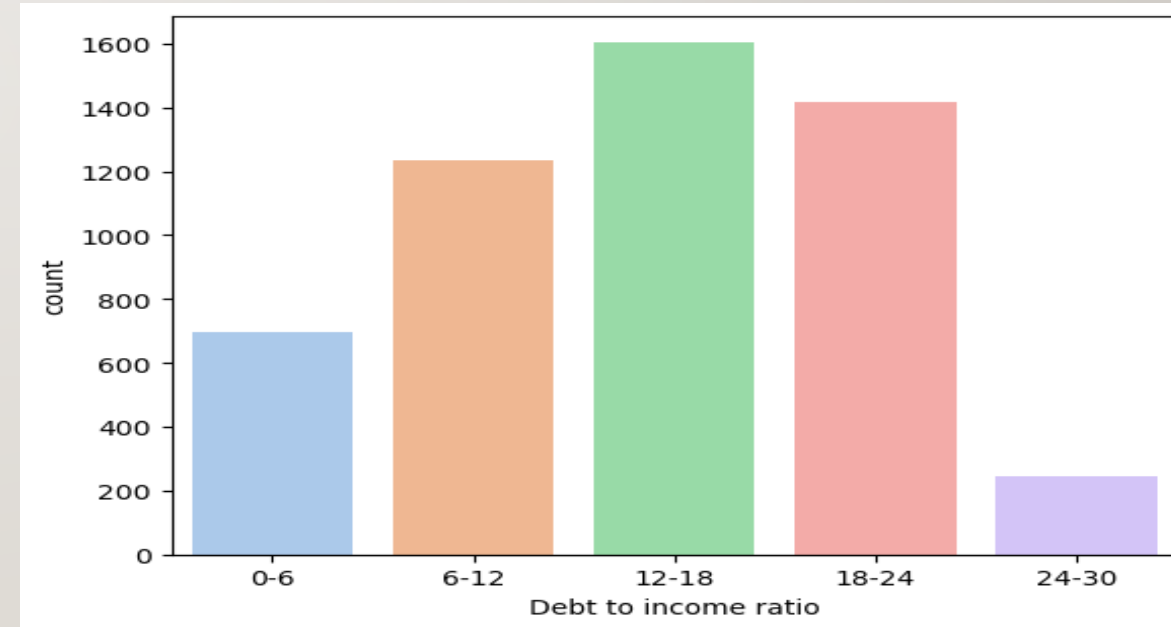- **Loans with Interest rates in 10%-15% range have higher defaulters.**

- **People with annual income in range 22k to 76k are more probable to be defaulters.**
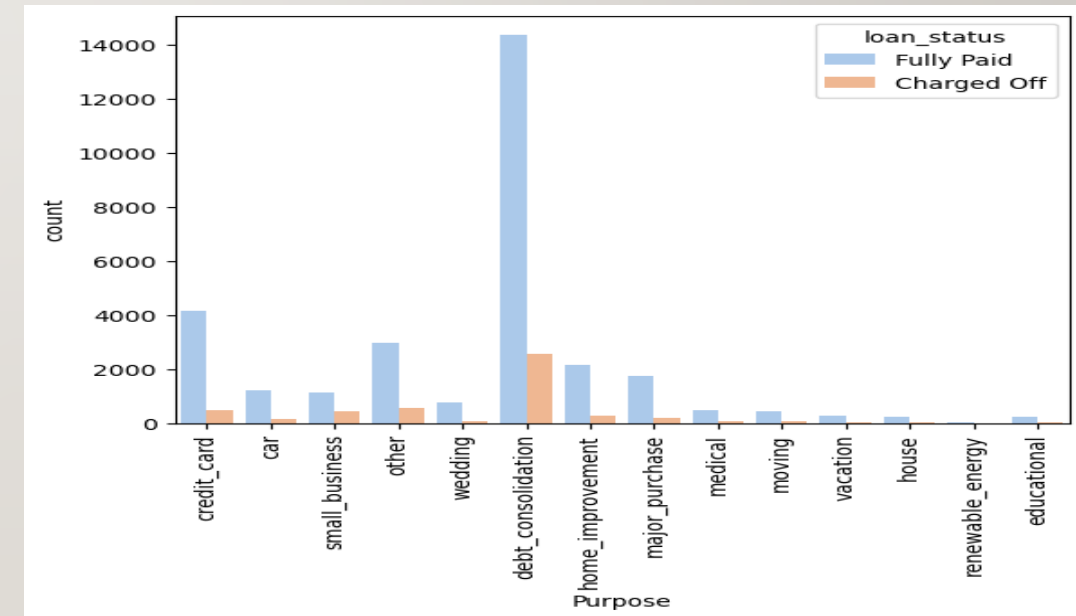

- **People with debt to income ratio in range 6 to 24 have higher chances of being in Charged Off category where 12-18 debt range has the highest chances of being default**

- **Least number of charge offs happen for source verified as the application is verified by a known source and maximum charge offs happen for non verified applications .**
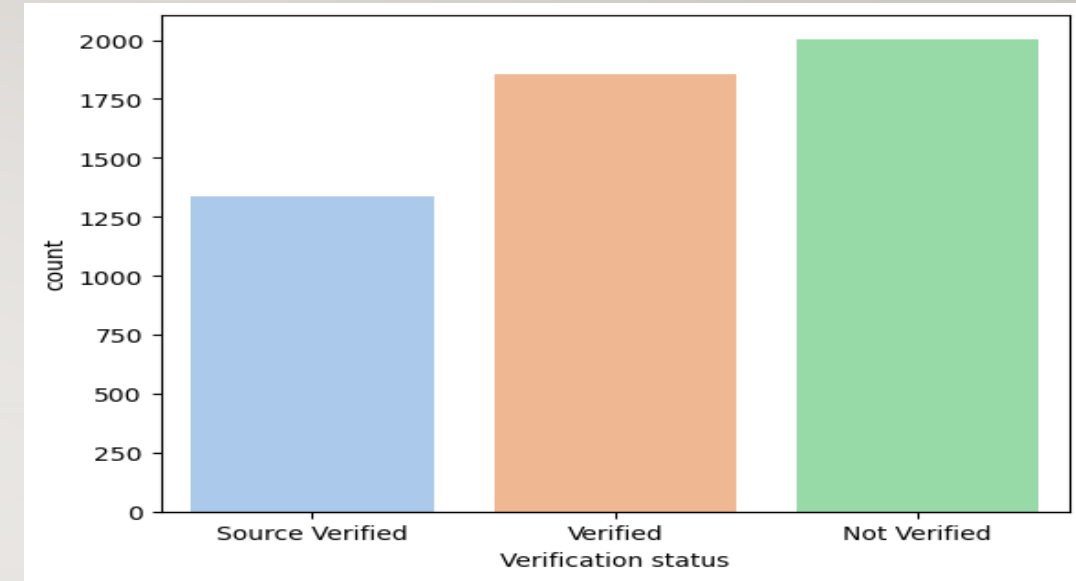
- *Majority of loan has been given for the debt consolidation purpose and has been majorly fully paid. People having debt reasonably takes more loans as compared to other purposes.*

Observations

- *Most of the loans are fully paid, around 14% of the loans are in charged off category*
- *People with 36 months as loan tenure chances to become defaulter.*
- *People with own house have least chances of being defaulters compare with Borrowers in rental home have highest chances of being defaulter.*
- *Grade B5 has highest number of defaults*
- *The person with 10+ years of experience have higher chances of loan defaulters.*
- Loans with Interest rates in 10%-15% range have higher defaulters.
- People with annual income in range of 22k to 76k are more probable to be defaulters.
- People with debt to income ratio in range 6 to 24 have higher chances of being in Charged Off category where 12-18 debt range has the highest chances of being default.
- Least number of charge offs happen for source verified as the application is verified by a known source and maximum charge offs happen for non verified applications .
- Verified loan applications have higher mean loan amount. This implies that the firms are first verifying the loans with higher values.
- *Majority of loan has been given for the debt consolidation purpose and has been majorly fully paid. People having debt reasonably takes more loans as compared to other purposes.*

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