

LENDING CLUB ASSIGNMENT

SUBMISSION

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Objective of Lending Club Analysis

Business Issue:

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.

Our objective is to improve the identification of the **Defaulter's behavior** to reduce cases of **Charged-off** from this study.

About Topic :

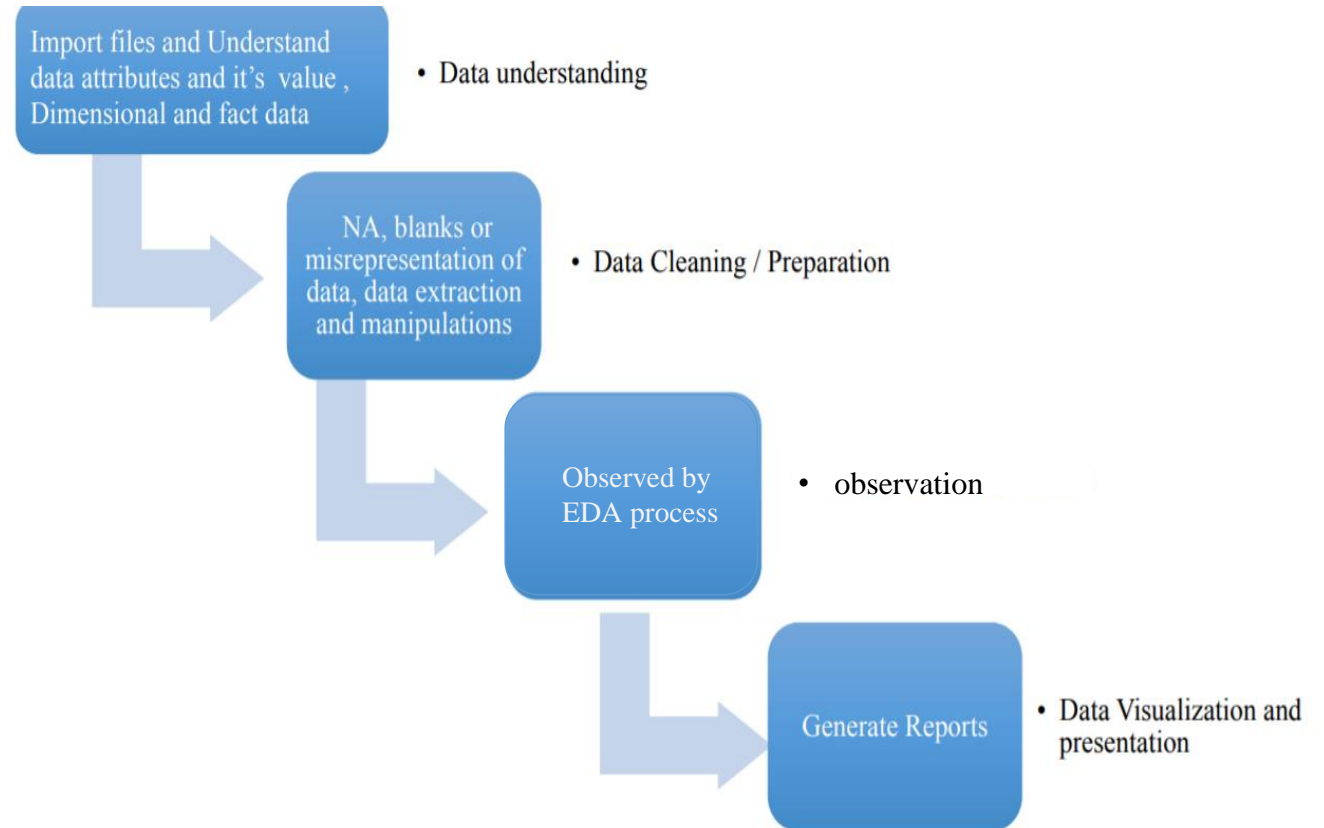
When a person applies for a loan, there are two types of decisions that could be taken, either **Loan Accepted** or **Loan Rejected**.

❑ **Loan Accepted:** If the company approves the loan, there are three possible scenarios described below:

- **Fully paid:** Those Applicants who has fully paid their loan. (with principal and interest rate.)
- **Current:** Those Applicants who still are in the process of paying the instalments. The loan is not yet completely paid. These applicants are not labelled as 'defaulted' as we can not decide yet that these candidates will pay or refuse to pay the amount of loan.
- **Charged-off:** Applicants who do not have any intention or refused to pay the instalments. i.e., he/she are labeled as **defaulted** on the loan.

❑ **Loan Rejected:** Applicants which are already rejected by company's following process. i.e., we have no data regarding those applicants.

Lending Club Analysis Approach



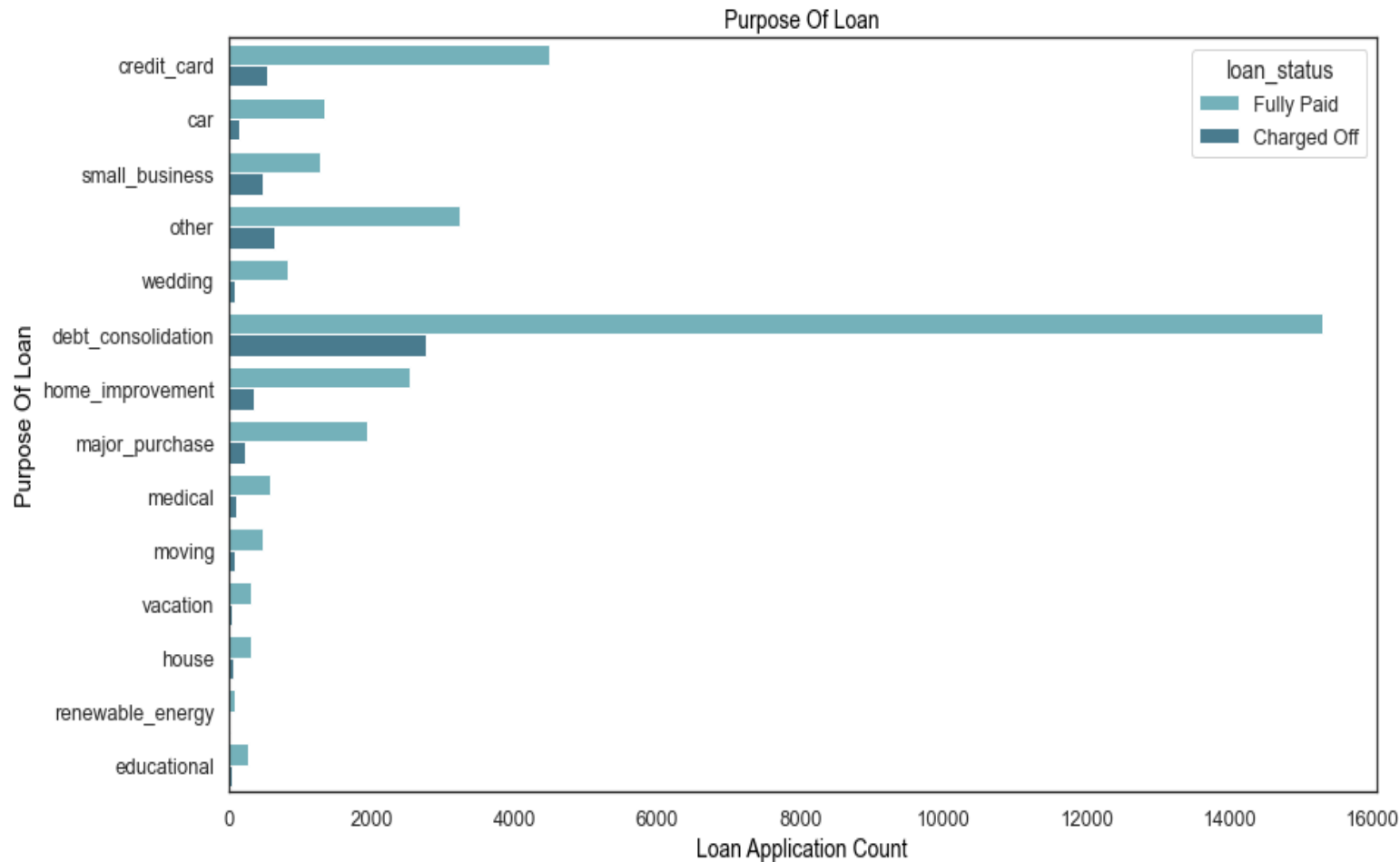
Data Analysis Objective

- ☐ Understanding the **driving factors** (or driver variables) .
- ☐ Cleaning the data and keeping only the relevant data with Driver variables.
- ☐ Removing the Outliers and focusing our analysis based on the Data spread.
- ☐ Performing Univariate Analysis and understanding the behaviors of the Defaulters.
- ☐ Performing Bivariate Analysis and understanding the influence of all driving factors.
- ☐ Deriving the Inferences and approaches from the analysis.

Important Areas for our Approach

- ☐ The **Purpose** of Borrowers for loan.
- ☐ The **Interest Rate** on which Borrowers get loan.
- ☐ **Year & Month** to apply for a loan.
- ☐ The **Verification Status** on borrowers.
- ☐ **Amount** of Loan taken by Borrowers and for what **Term** (Period)
- ☐ **Grade & Subgrades** on which applicants are divided.
- ☐ Status of **Home Ownership** of an applicant.
- ☐ **Annual Income** of the Applicant.
- ☐ **Public Record Bankruptcies** of Applicant.
- ☐ **Area/Location** of the Applicants.
- ☐ **DTI** for the Applicants.

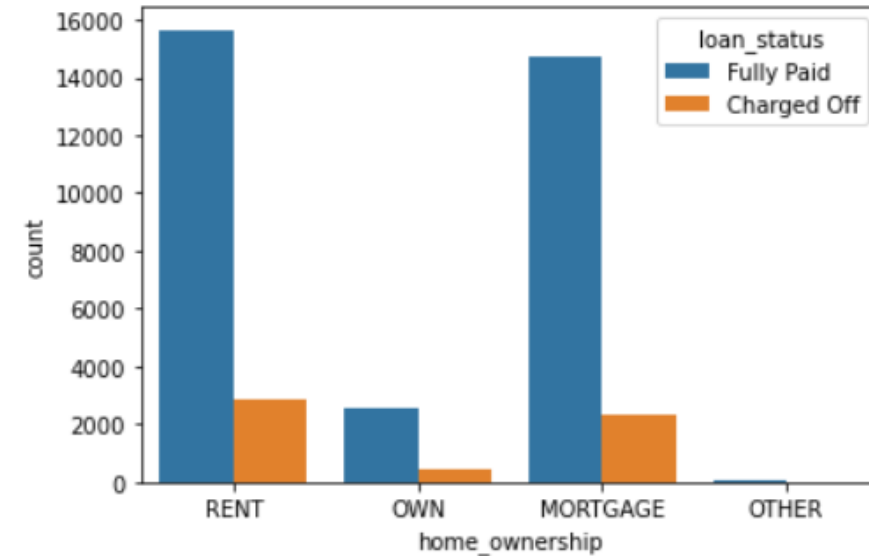
Purpose of Loan



- Most of the loans were taken for the purpose of :-
 1. Debt Consolidation
 2. Paying credit card bill
 3. Others.
- Number of charged-off count also high for these loans.
- Debt consolidation has the highest amount of charged off count compare to others.

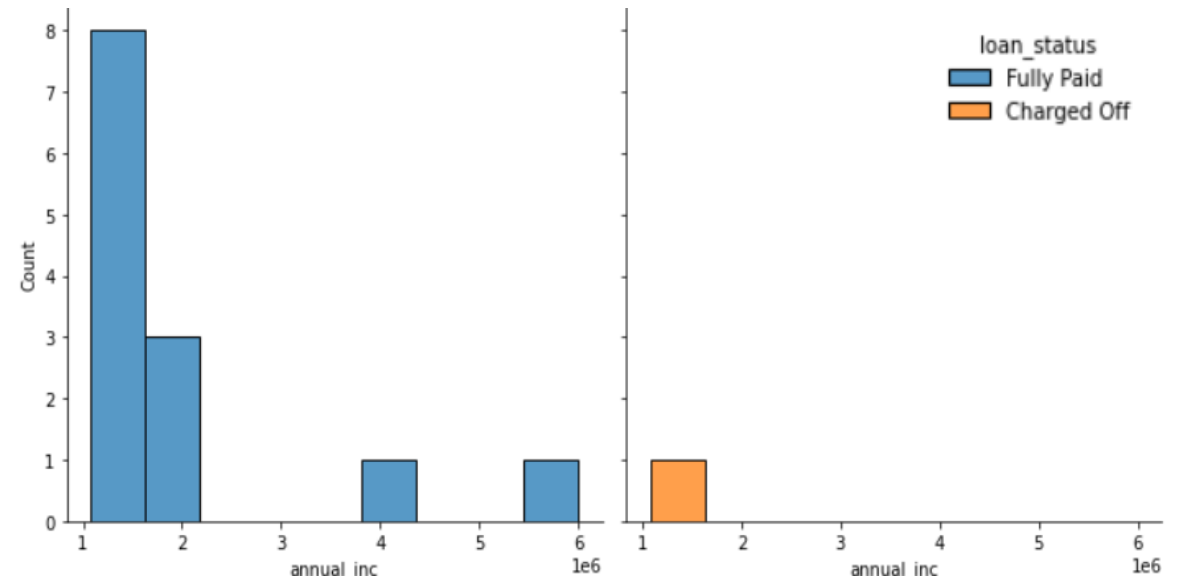
Ownership of Home

- Loans which from individuals without "OWN" home are likely to have charged - off than who own homes



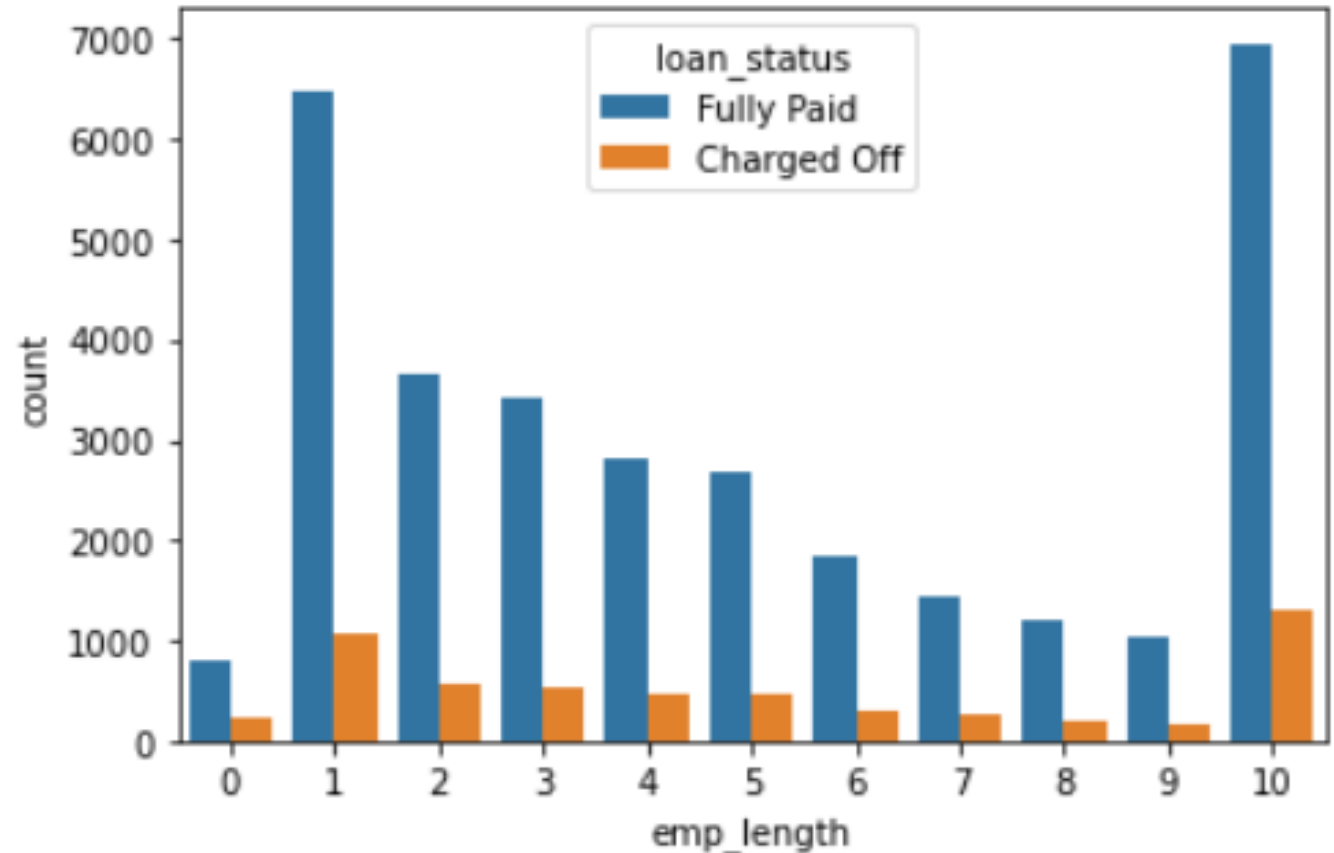
High Annual Income

- High annual Income persons(earning more than 1Million) are less likely to Charged-off
- Charged Off loans are spread across annual income in between 1 to 2 Millions only.



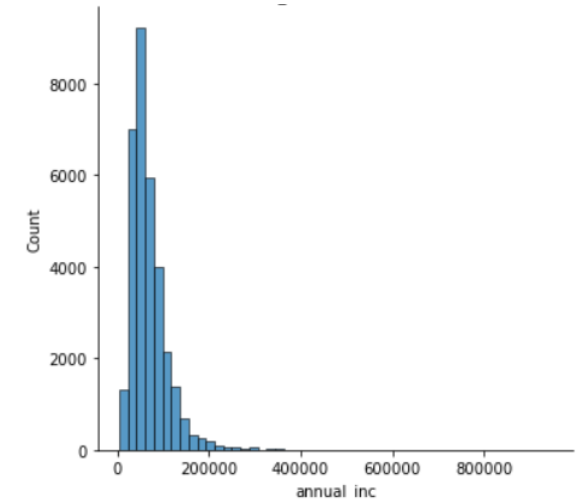
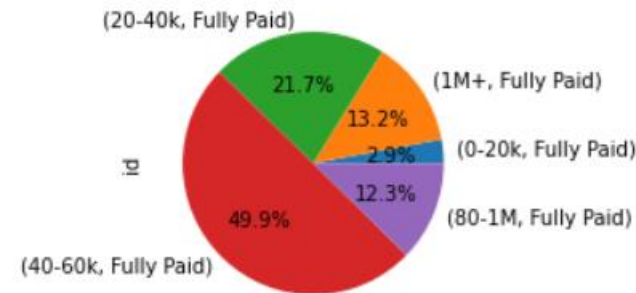
Employee Years of Experience

- Applicants/Borrowers with No Job or in job for less than 1 year, tends to have higher chances of charged off as compared to people who have more experience of work.
- Borrowers with 9 years or more have least chances of charged off .
- It's clear that if **employment length increases** , **income also increases** which shows a **down fall in charged off with increase in employment length**.
- Also, its clear that people with no income or less income have **no other sources to repay** the loan and that's why they tends fall for **charged off** more.

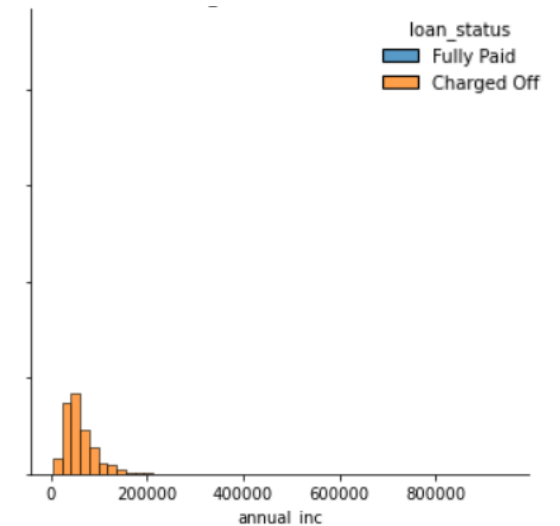
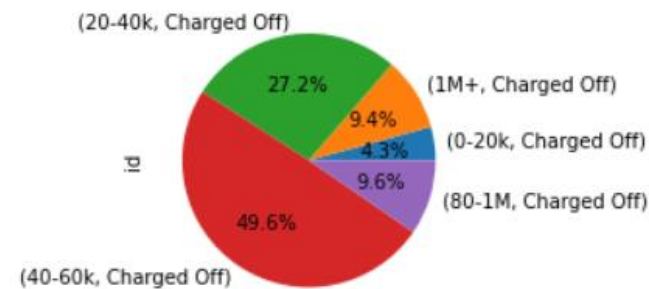


Annual Income of the Borrowers

- Borrowers with annual income of 2 lakh or less tends to have more chances to charged off .
- These borrowers are more likely those who have less then one year of employment length or have no job.
- Borrowers with annual income more then 80 thousand to 1 millions have least amount of charged off and have more rate of fully paid loans.

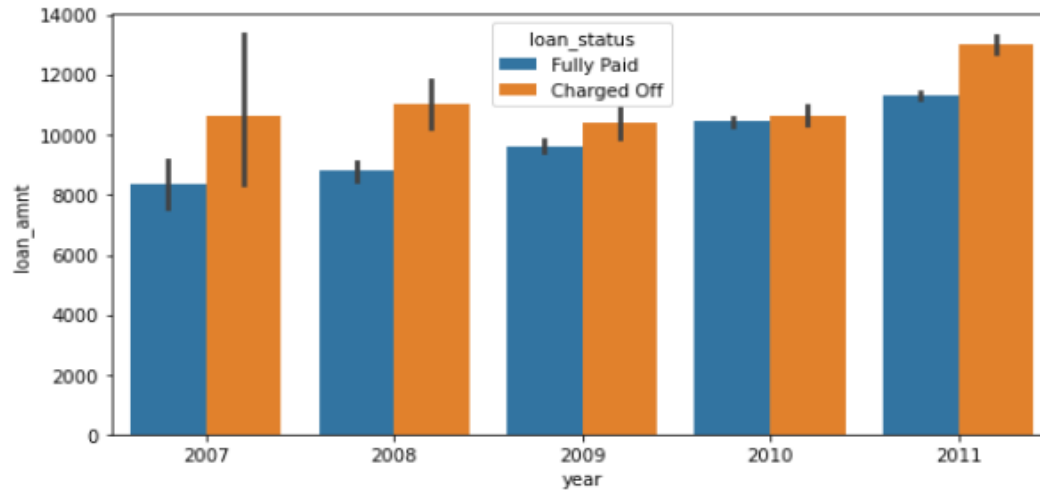


The data is spread for incomes less than 200000



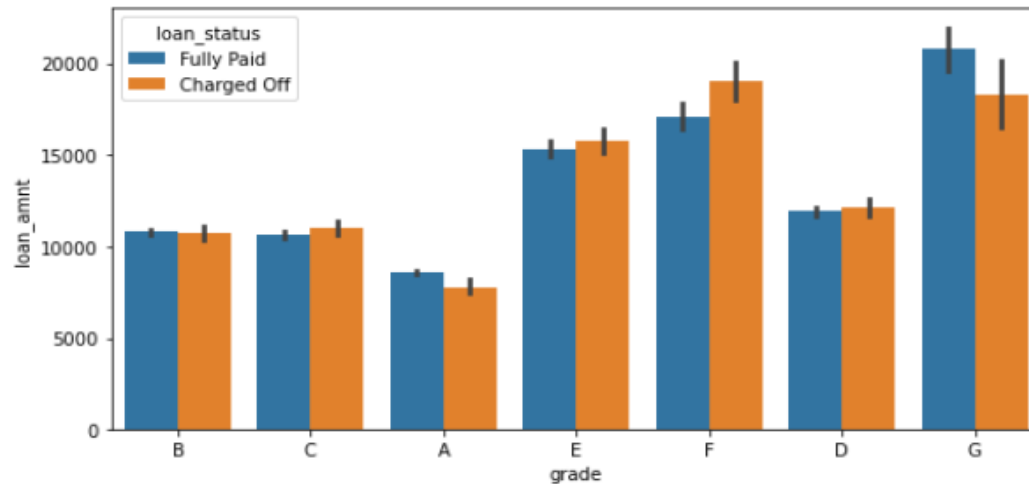
Annual income is inversely proportional to charged off

Data Visualisation & Observation



Year vs Loan Amount

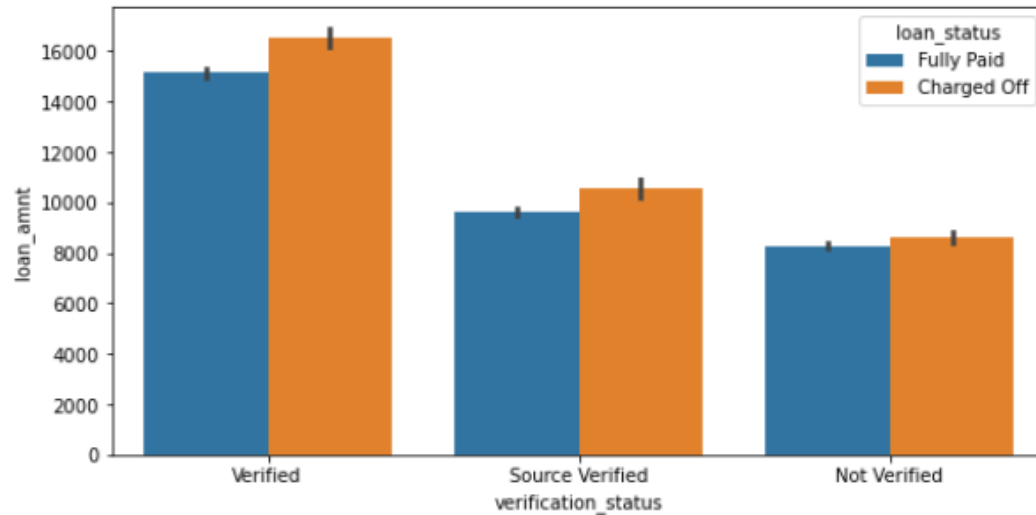
- Lending of Loan amount increases each year.
- Increase in number of loan applications are adding more number of charged off applications.



Grade vs Loan Amount

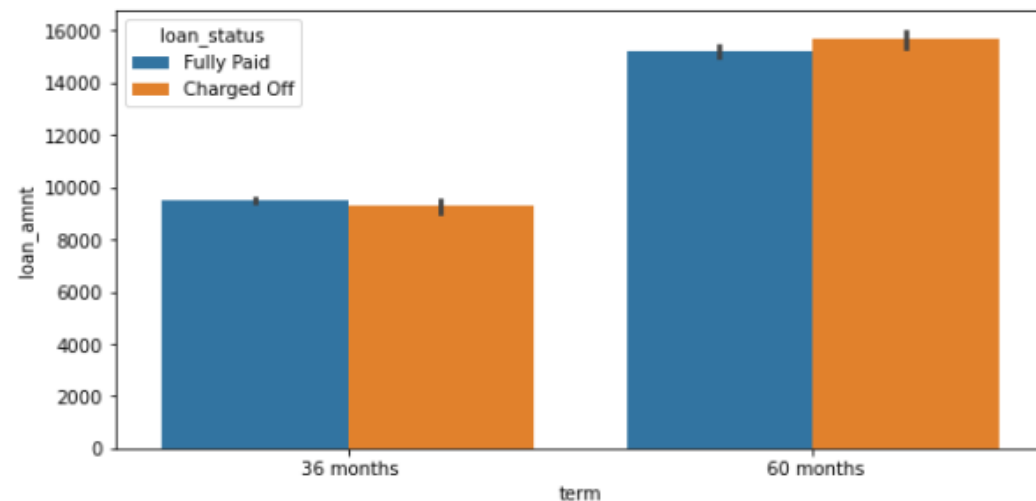
- Highest percentage of Fully paid loans belongs to Grade 'G'.
- High percentage of Charged-off loans belongs to Grade 'F'.

Data Visualisation & Observation



Verification Status vs Loan Amount

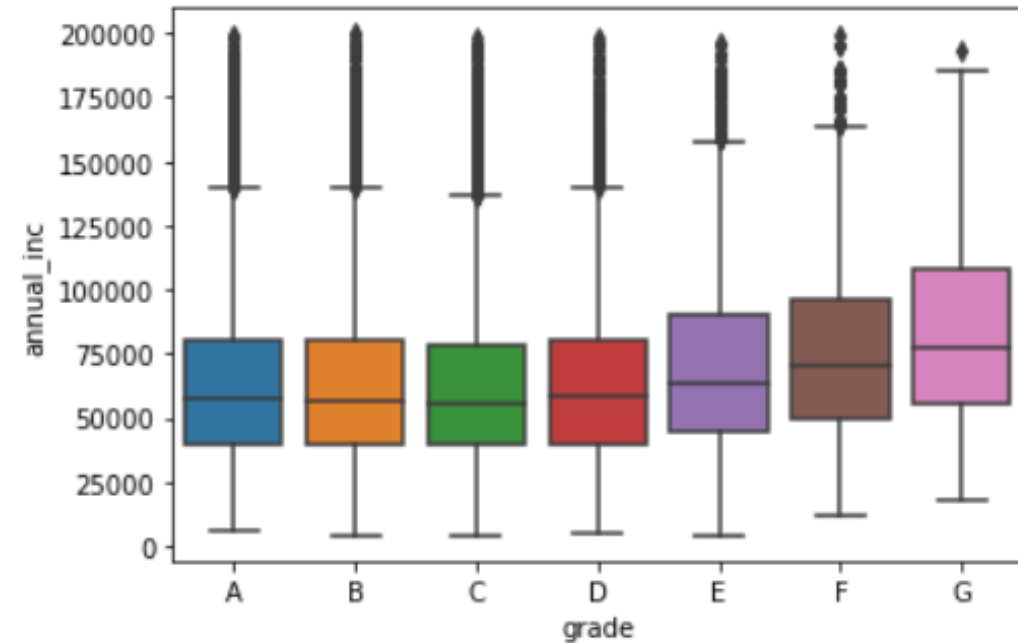
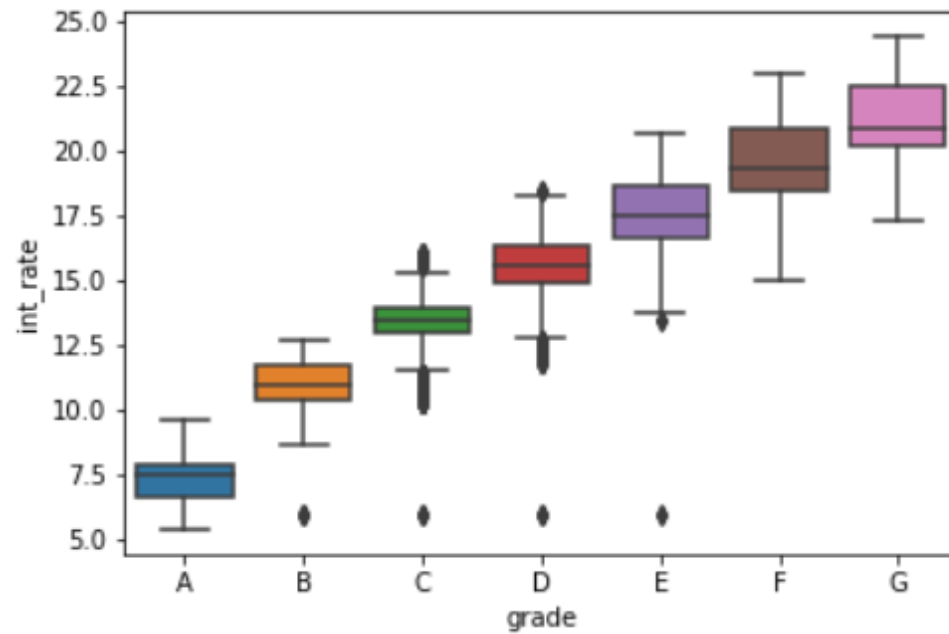
- Charged-off loans are relatively same across all types of verifications
- Data Spread is similar for all categories.



Grade vs Loan Amount

- Highest percentage of Fully paid loans belongs to Grade 'G'.
- High percentage of Charged-off loans belongs to Grade 'F'.

Bi-Variate Analysis for Grade & Annual Income



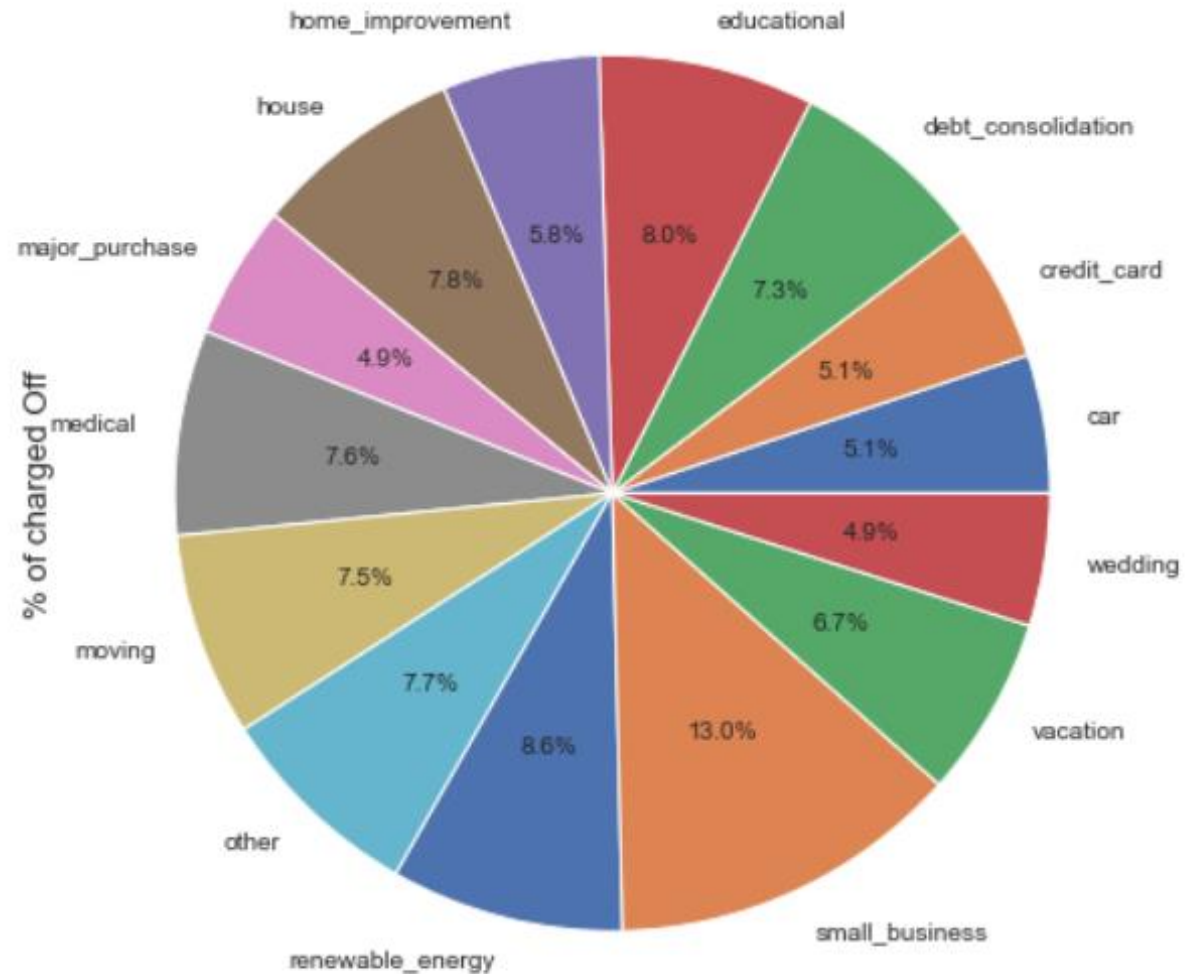
As the grade increases from A to G. Interest rate & Annual Income increases proportionately.

Purpose Of Loan

Top 3 Categories which effecting Charged off:

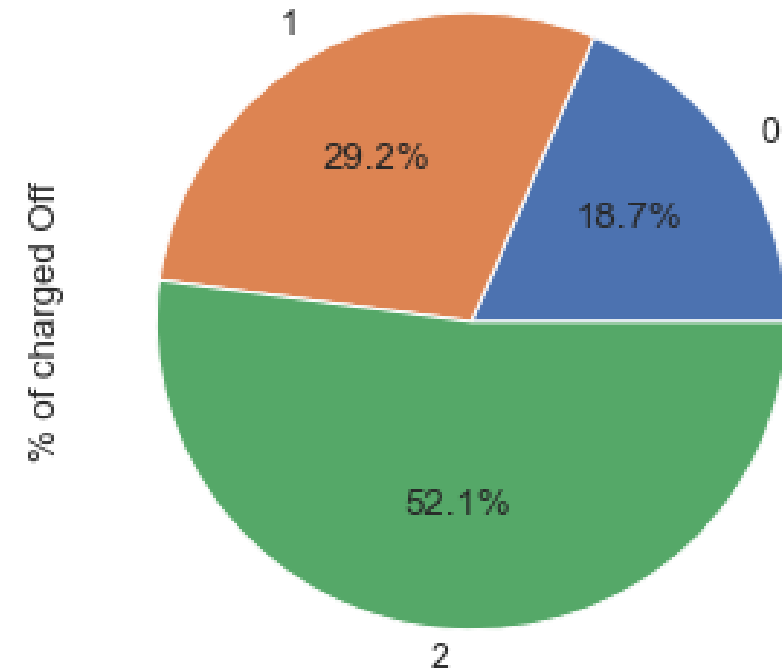
- 13% of loan for small business
- 8.6% of loans for Renewable energy
- 8% of loans for Education

Borrowers who took loans for starting a new business or for small scale business, tends to fail with their business ideas which turns out with loss cause of which they are unable to pay back.



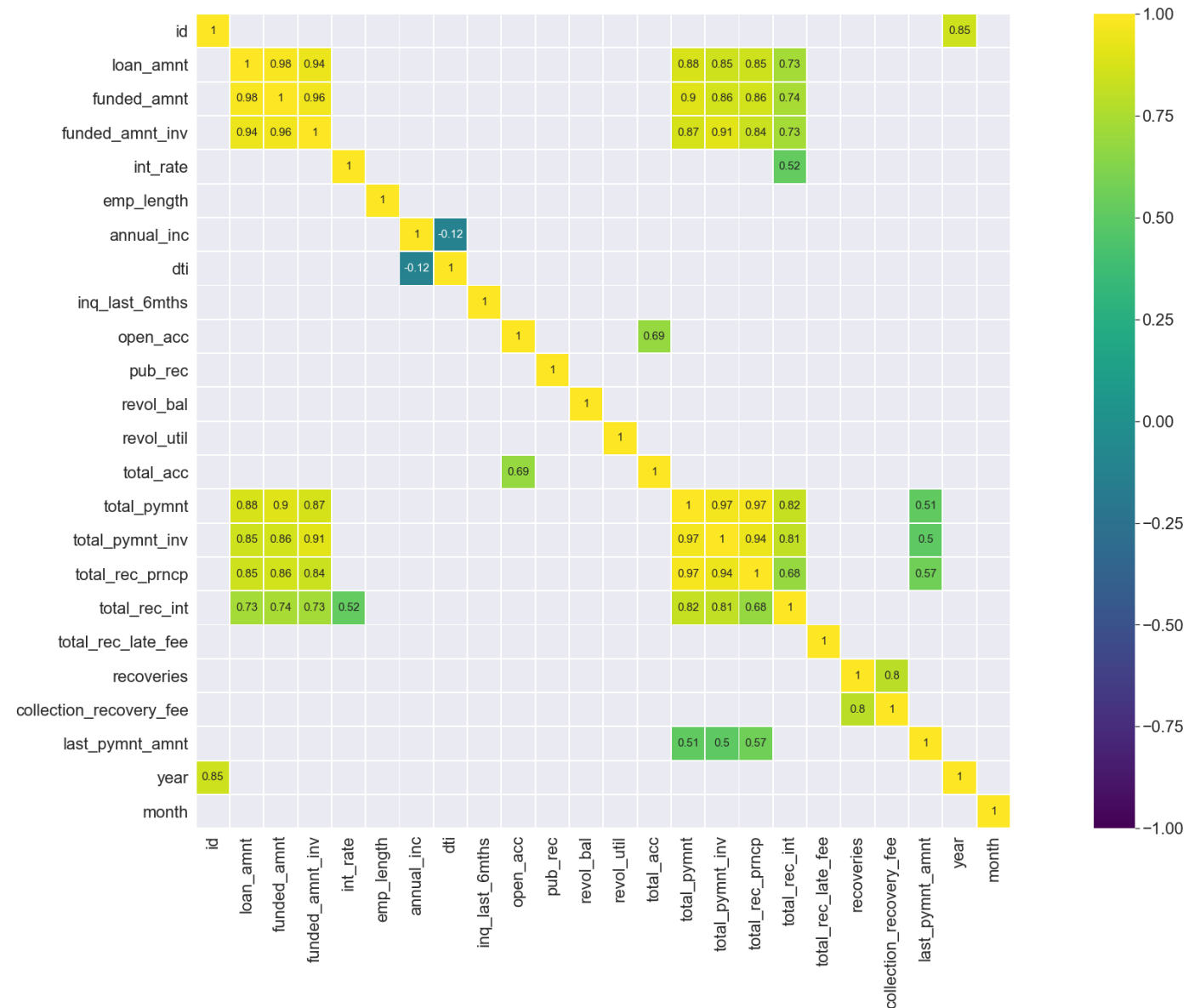
PUBLIC RECORD BANKRUPTCIES

- Borrowers with 2 public record bankruptcies are more likely to charged off as compare to others
- Although borrowers with No public record bankruptcies have some chances to charged off too.
- We can also conclude that with increase in public record bankruptcies the risk of facing charged off increases.



CORRELATION

- **DTI** has a **negative** co relation with **Annual Income** which implies that, as Income increases the DTI decreases proportionally.
- Interest received to date have a some strong positive relation with Interest rates. Amount of interest received increases with increase in interest rates.
- **Year** have a strong positive relation with **ID**, which shows that in each progressive year, number of applicants increases which also comes with higher risk of facing Charged-off every Year.



CONCLUSIONS FROM THE ANALYSIS

From the Univariate & Bivariate Analysis, we can say that,

- Borrowers Default less with **Higher earning** (>1million) have very **low chances to Charged-off** (lower risk rate)
- People with Annual income of **80k to 1M** has low Defaulters
- Annual income of **0-20k** has more rate to charged-off the loans.
- Almost 30%, Charged-off Rate is accounted more for the Purpose of **Small business, Renewable Energy & Education.**
- LC has **good grading system.** A being the best grade which has lower Defaulters.
- Borrowers without **owning a house** have higher rates of risk towards charged off.
- Most of the Defaulters' with **more public record bankruptcies** have high DTI.(As it is negatively correlated).