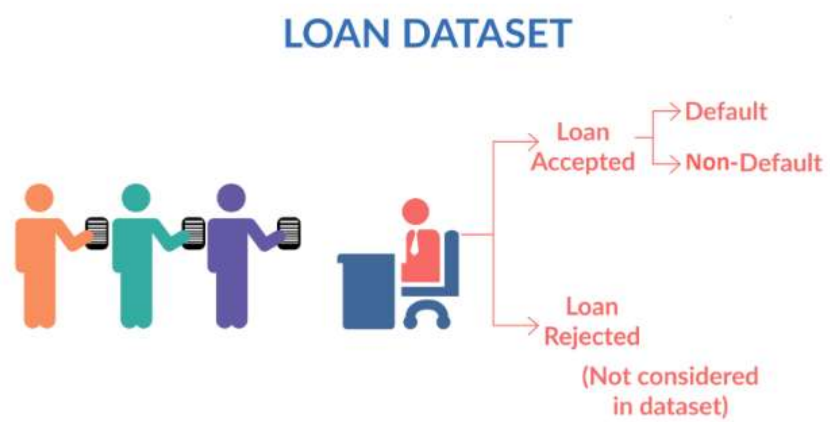
LENDING CLUB - GROUP CASE STUDY

Study Group

- Habilan Sridhar
- Sai Anuraag gampa

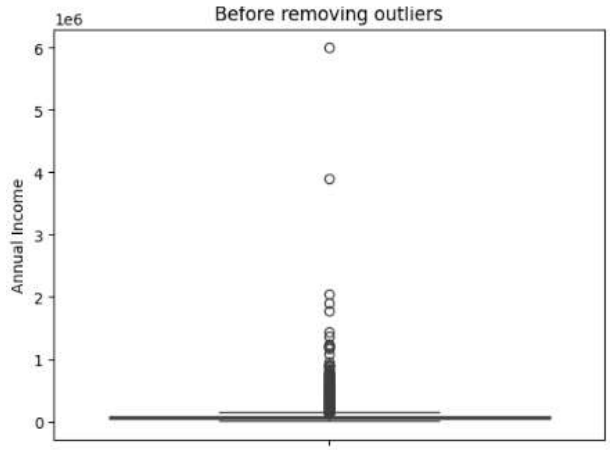
PROBLEM STATEMENT

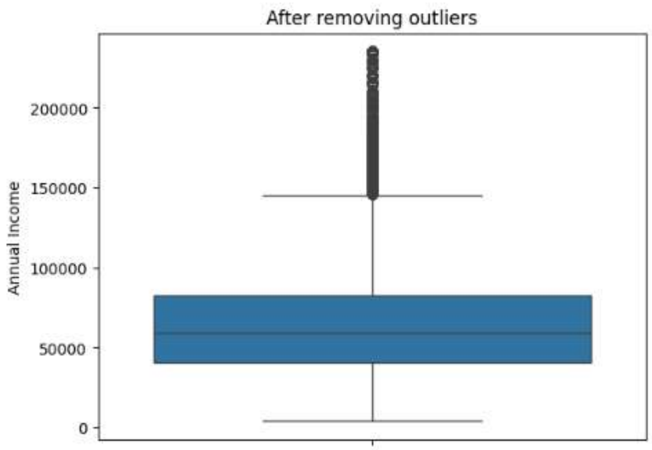
- You work for a consumer finance company which specializes in lending various types of loans to urban customers. When the company receives a loan application, the company has to make a decision for loan approval based on the applicant's profile. Two types of risks are associated with the bank's decision:
  - 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



Steps for the analysis

1. Understandi ng the data and exploring some metrics about the domain
2. Data Cleaning
3. Handling Outliers
4. Deriving new metrics from the existing column
5. Univariate Analysis
6. Bivariate Analysis
7. Multivariate Analysis
8. Proposal / Suggestion to Lending club

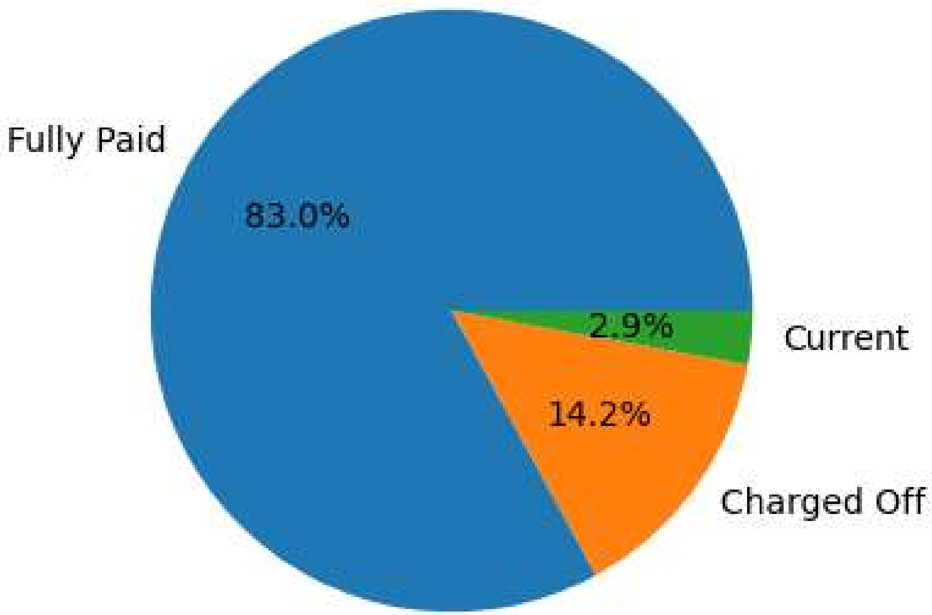




Handling outliers

we can see there is a greater number of Outliers, so we need to remove those to make the data more sensible.

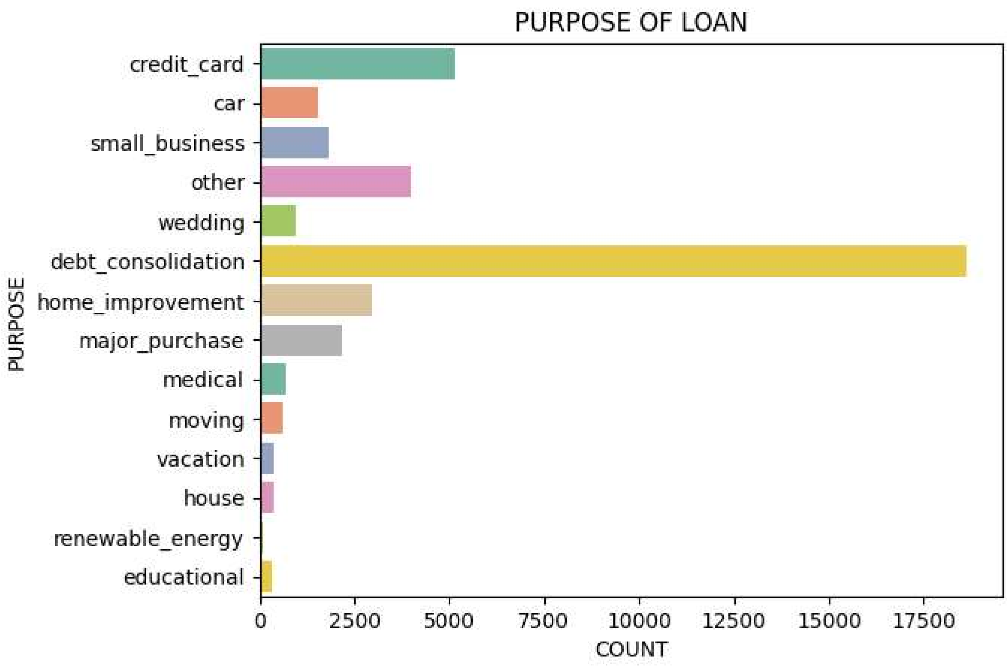
To remove Outliers we have replaced the outliers values with the 99% quantile value



LOAN STATUS DISTRIBUTION

- 14% loans were charged off out of total loan issued.
- 83% loans were fully paid out of total loan issued.

- Fully Paid 82.96 %
- Charged Off 14.17 %
- Current 2.87 %



PURPOSE OF LOANS

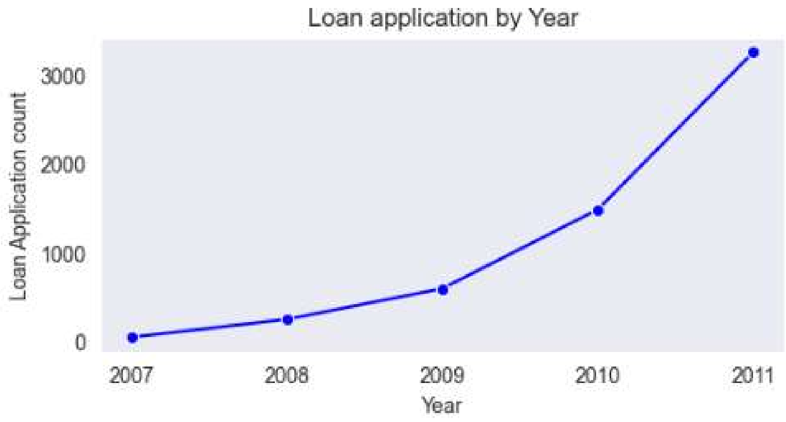
Observation:

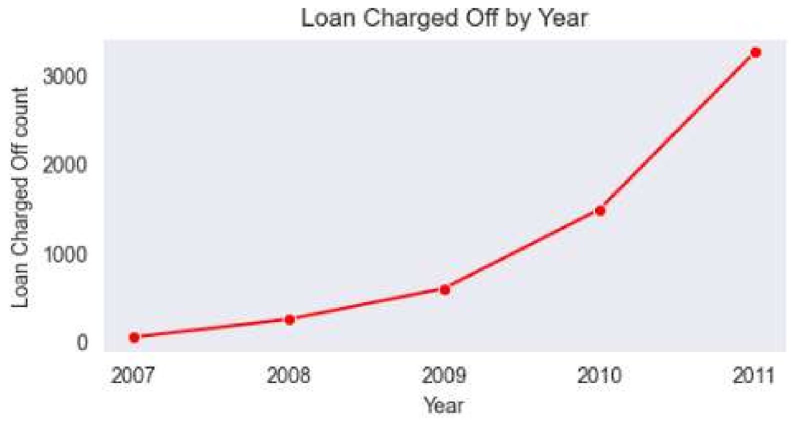
- Most of the customers took loan for debt consolidation and credit card payment
- Number of loans taken for Debt Consolidation is too high
- Nearly 47% of loans taken for the purpose of Debt Consolidation

Top 3 Purposes of loan

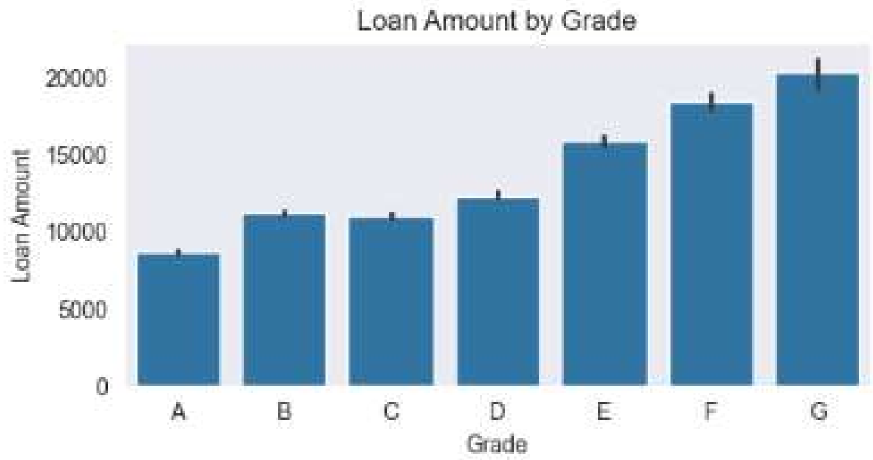
- Debt Consolidation
- Credit Card Payment
- Other

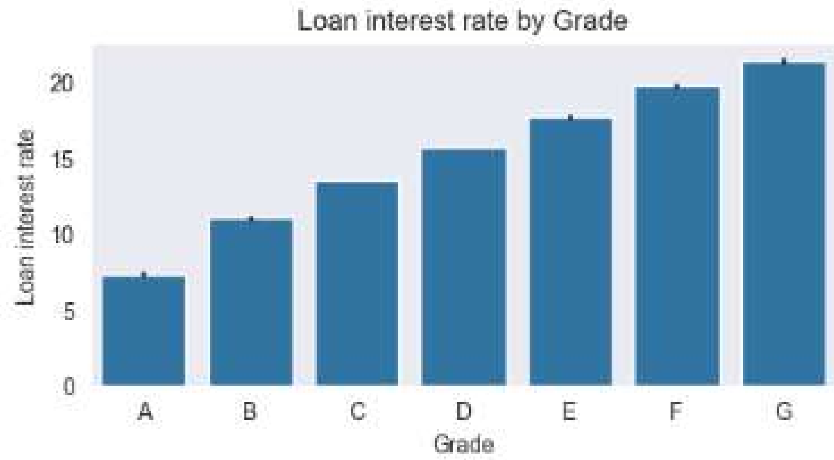
Loan Applied vs Loan Charged Off by Year





Observation:	Loan Application is getting increased Year by Year
	Loan Charged Off is getting increased Year by Year



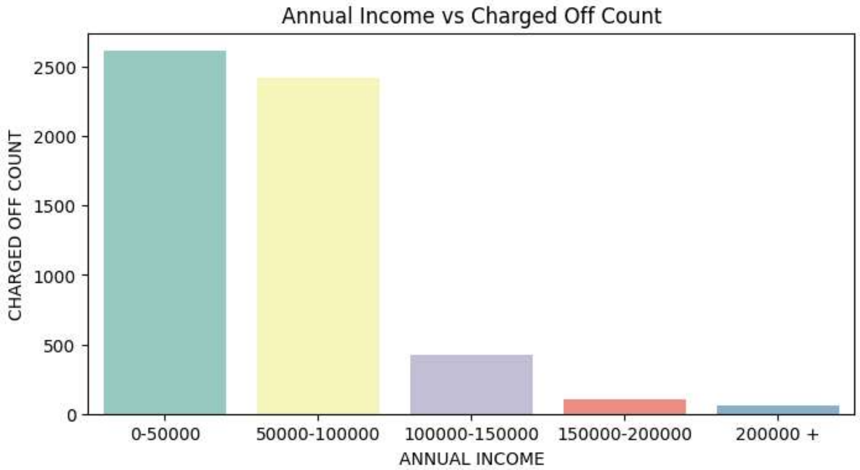


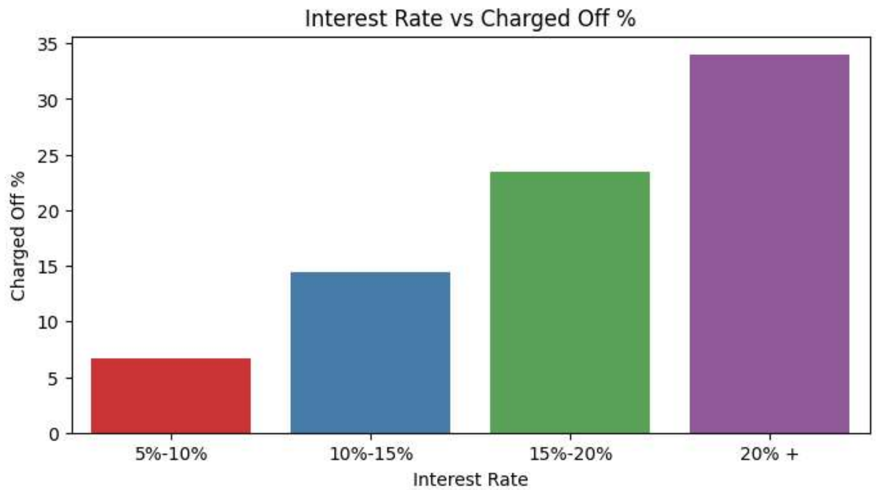
BIVARIATE ANALYSIS BY GRADE

Observation:

Loan Amount is getting increased as Grade is increased from A to G

As Loan Amount is getting increased Loan interest rate is also getting increased by grade from A to G



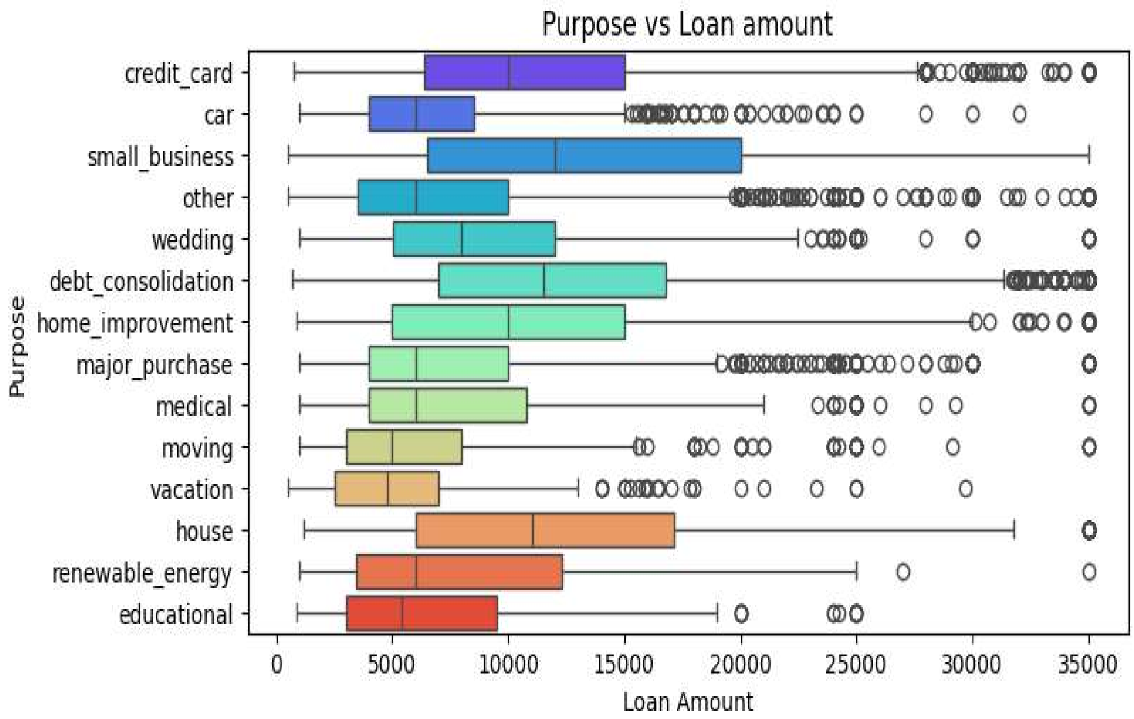


BIVARIATE ANALYSIS – ANNUAL INCOME, INTEREST RATE vs LOAN CHARGED OFF

Observation:

- Charged off is getting decreased with increase in Annual Income.
- Lower the Annual income, Higher the chance of Charged Off
- Charged off is getting increased with increase in interest rate.
- Loans with lower interest is having less chance of Default.

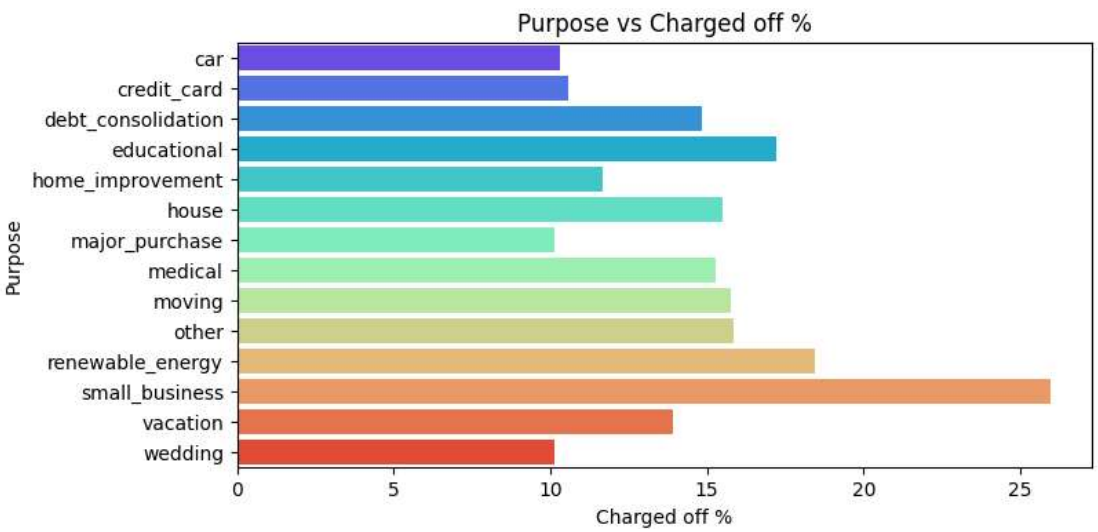
BIVARIATE ANALYSIS – PURPOSE vs LOAN AMOUNT



Observation:

- Loan amount is higher for the purpose of Small business
- Median is higher for the small business
- Median is higher in debt consolidation as well
- The higher loan amount the higher chance of default.

BIVARIATE ANALYSIS – PURPOSE vs CHARGE OFF %



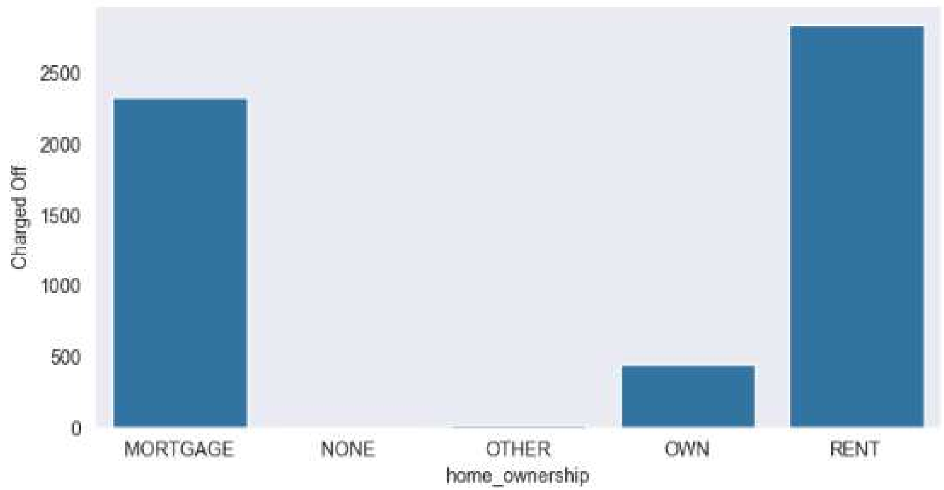
Observation:

- In the Univariate analysis, we found Most of the customers took loan for debt consolidation and credit card payment but from the above Bivariate analysis, it is evident that customers who took loan for small business have a chance of getting charged off
- Purpose of Credit card and Debt consolidation is less likely getting charged off compared to Small business

Home Ownership Status

Observation:

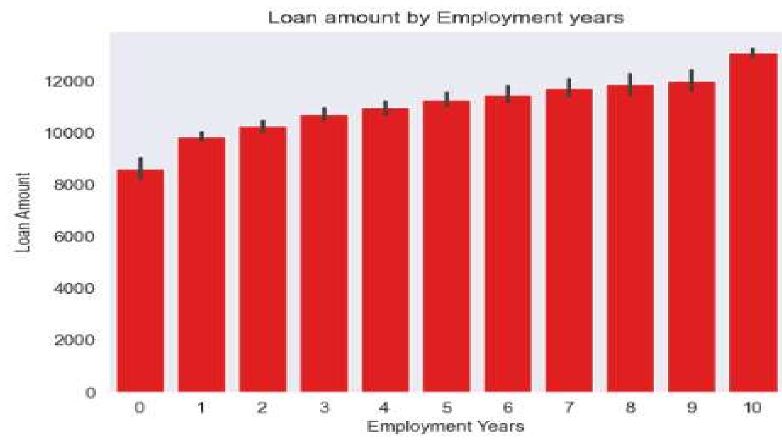
- Those who are in Rent house and mortgage house is having high chance of getting default
- Those who are in own house is having low chance of getting default.
- Due to Financial instability, there is high chance of getting default.
- Rent Houser’s is having higher risk than mortgage housers

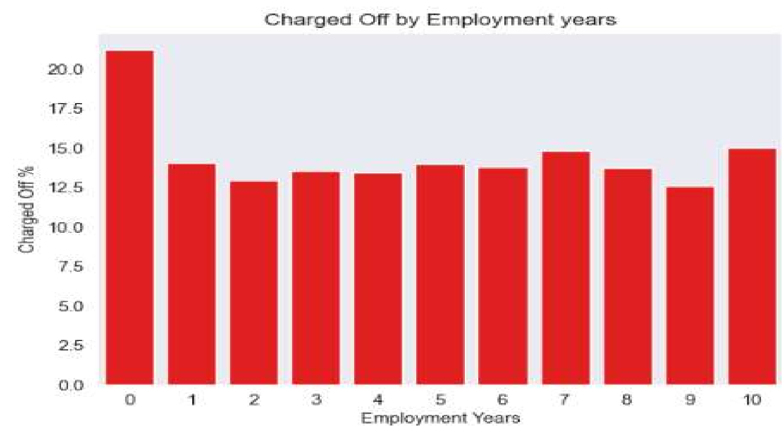


Impact of Work Experience over Loan Default

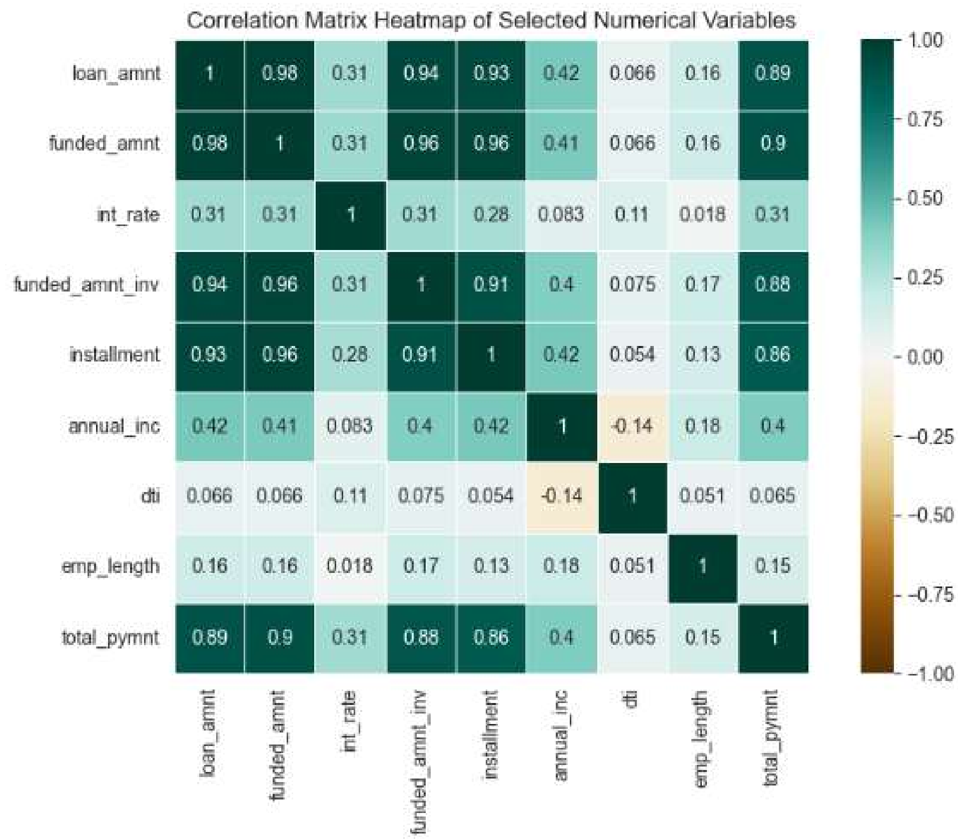
Observation:

- Borrowers with 0 or less than 1 years of experience leads to more loan defaults due to no source of income or less source of income
- Though the loan amount is lower for the persons with 0 or less than 1 year of work experience, their charged off proportion is higher.
- This also shows the loan amount is increased as work experience increases





Multivariate Analysis



Observation:

- Loan Amount, Funded Amount, Funded Amount by investor, Installment and Total payment are highly correlated with each other
- Annual Income and Debt to Income Ratio are negatively correlated with each other
- This shows increase in Annual income will decrease the Debt to Income ratio and vice versa

Key Factors for Loan Defaults

- **Higher Interest Rates**: Loans with higher rates show a greater likelihood of default, likely due to increased financial burden.
- **Large Loan Amounts**: Larger loans are slightly more prone to defaults, possibly due to the greater financial commitments they represent.
- **High Debt-to-Income Ratio (DTI)**: A higher DTI suggests borrowers are overleveraged, increasing the default risk.
- **Home Ownership Status**: Renters and those with mortgages show different default patterns than outright homeowners, possibly due to varying financial stability.
- **Lower Loan Grades**: Loans with lower grades (indicating higher risk) have higher default rates.
- **Loan Utilization Rate**: Borrowers who utilize a larger portion of their loan amount tend to default more, reflecting potential financial stress.
- **Employee Experience**: Person with 0 or less than 1 year of experience tends to be loan default.

Suggestions to Lending Club

- Loans for small business applicants should be thoroughly reviewed.
- Loan approval should be avoided for persons with prior public bankruptcy records.
- Applicants with lower yearly incomes should avoid taking out large loans with high interest rates.
- Loan approval should be avoided by applicants who do not have a source of income.
- Lending club should thoroughly check Borrower’s work experience.