

Lending Club Case Study

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Introduction

- Scope of this case study is to understand the risk involved while lending money to the borrowers.
- Through this we try to understand three types of risk drivers what is the probability that person will get default, loss on being default, and what is the exposure of other borrowers on getting default.
- Analyzing credit risk helps lenders decide whether or not to extend credit based on a borrower's capacity to repay their debts.
- The results of the credit risk analysis procedure are all influenced by expected losses, risk-adjusted return, and other factors.
- The likelihood of default, the loss in the event of default, and the exposure at default are three variables that help to calculate the expected loss (cost of credit risk).

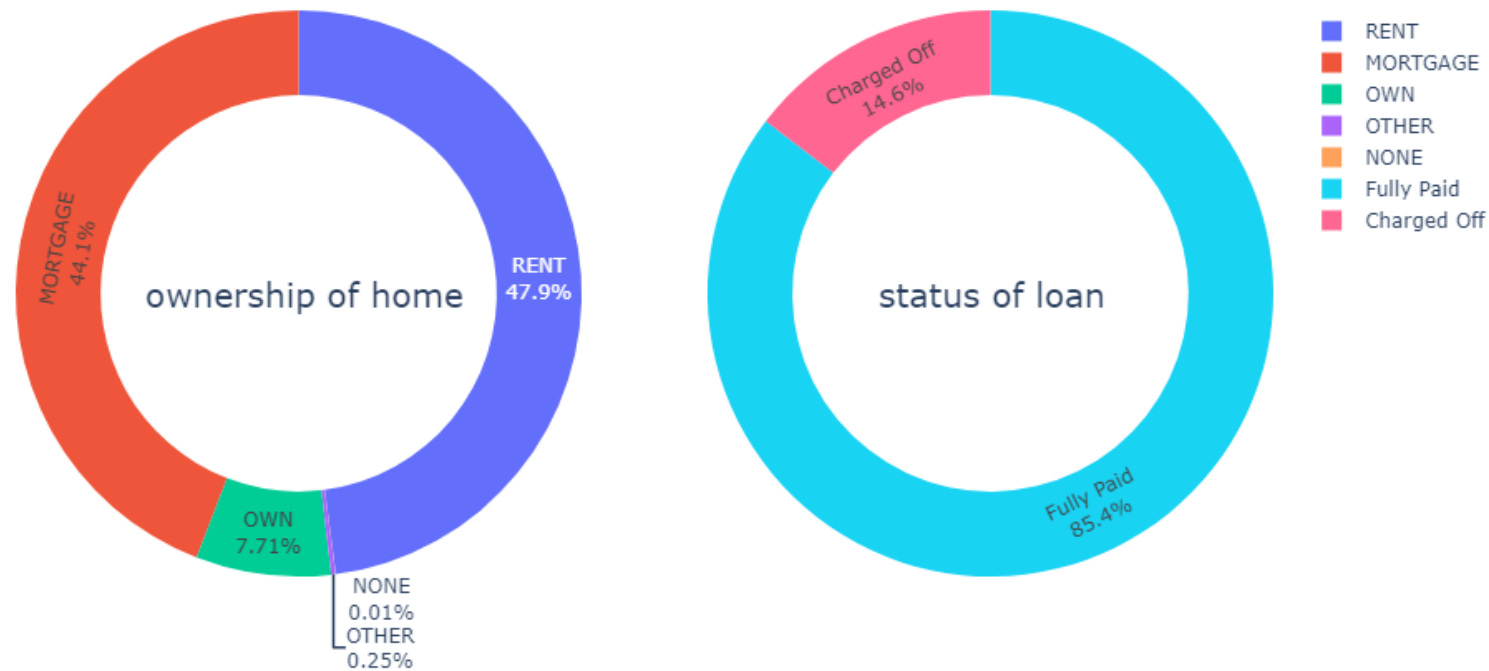
Library used

- Pandas
For Data Frame Manipulation.
- Numpy
For efficient computation of data.
- Matplotlib, Seaborn
For Data Visualization.
- Plotly express
For interactive data visualization.
- Plotly figure factory, Plotly graph objects
For adding more interaction to visualization.
- Warnings
To avoid any warnings which are getting generated due to depreciation / appreciation in python packages.

Univariate Analysis

Home Ownership and Status of loan

Home Ownership and Status of Loan

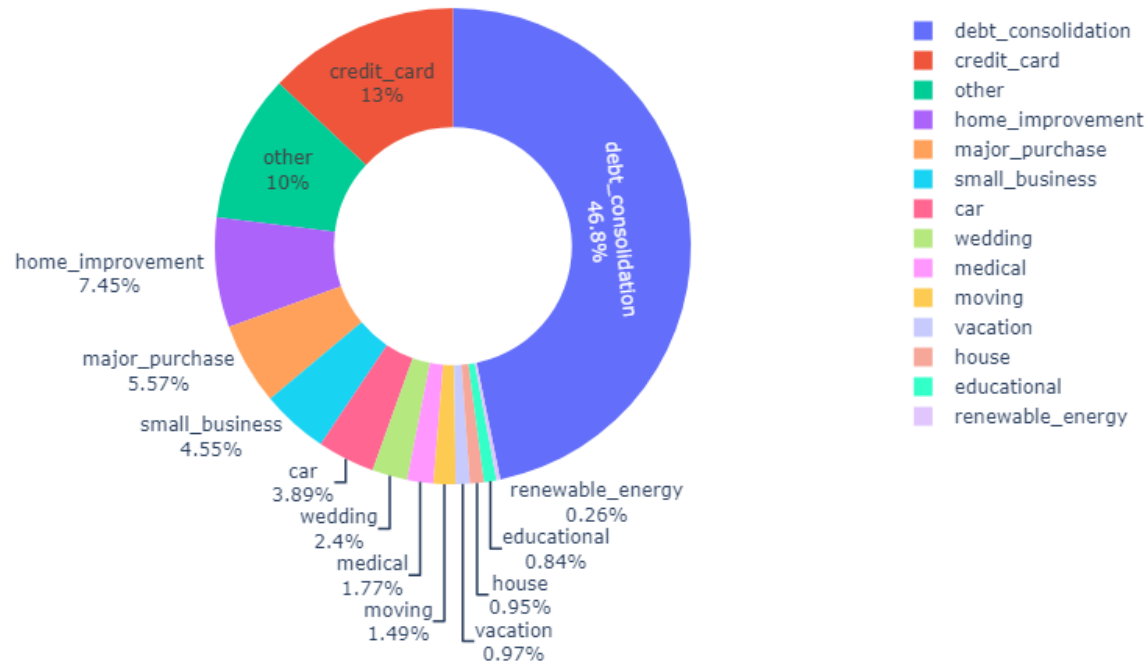


newplot (2)

- 47.9 % of borrower leave on rent.
- 44.1 % Of borrower have there house on mortgage.
- 7.71% people own there home.
- 85.4% of people has fully paid their loan while 14.6% are defaulters.

Purpose of loan

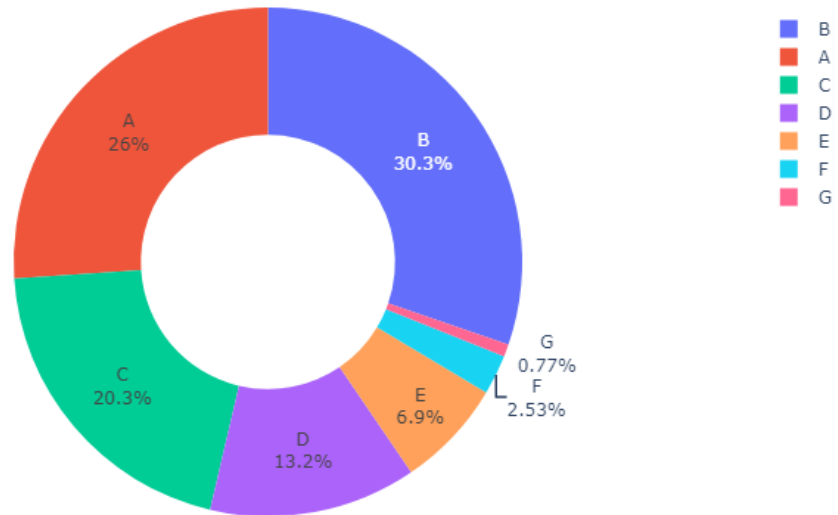
Purpose of taking a loan



- Almost half of borrowers borrow for consolidating their debts.
- 13 % take borrow money as credit bill.
- While other loan which are in less percentages are taken for lifestyle improvements.

Borrowers Grade.

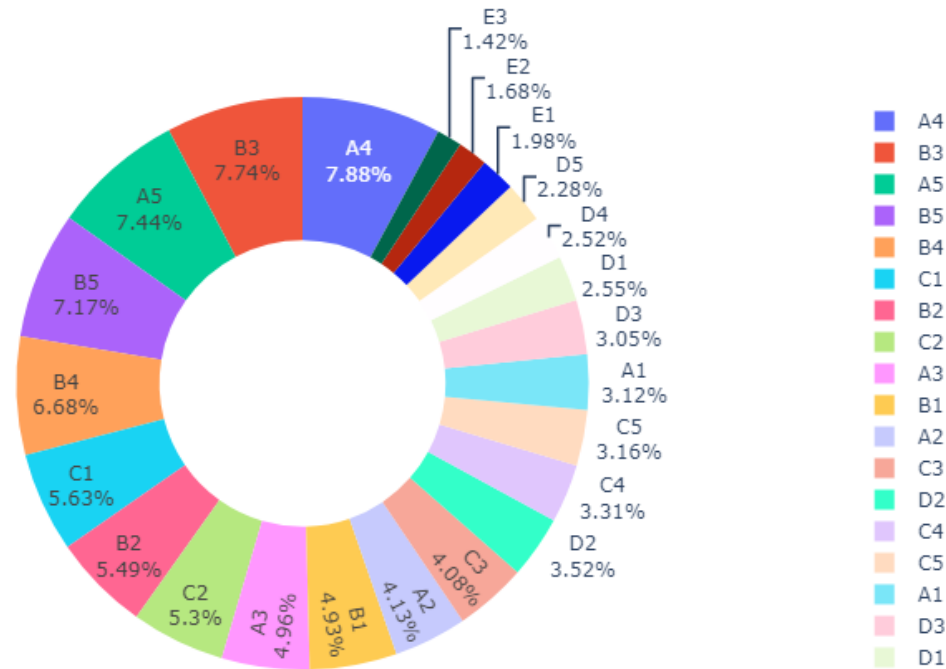
Grade of loan



- 75%+ of the borrowers fall in the grade B, grade A and grade C.

Sub Grade of loan

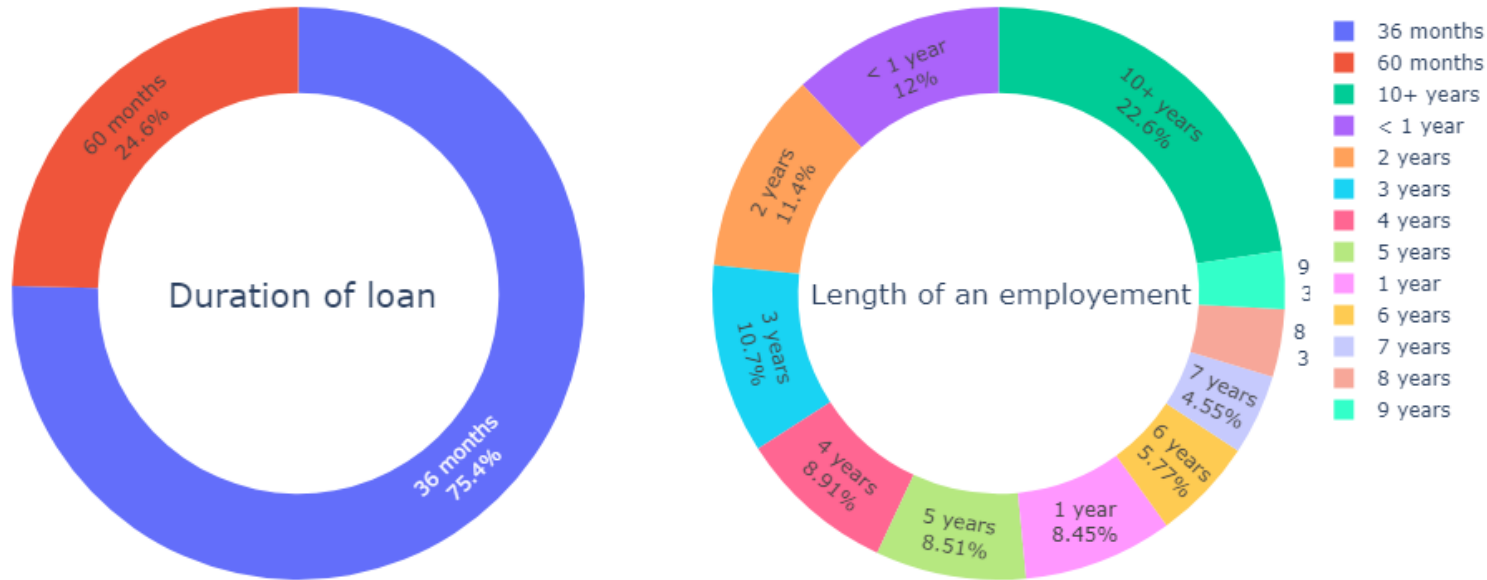
Sub Grade of loan



- A4, A5 are the subgrade in grade A.
- B3, B5, B4, B2, B1 are the subgrade in grade B
- C1, C2 and C3 are the subgrade in grade C.
- From above we can observe that Grade B type of borrowers exist in our data.

Loan Duration and Length of an Employment

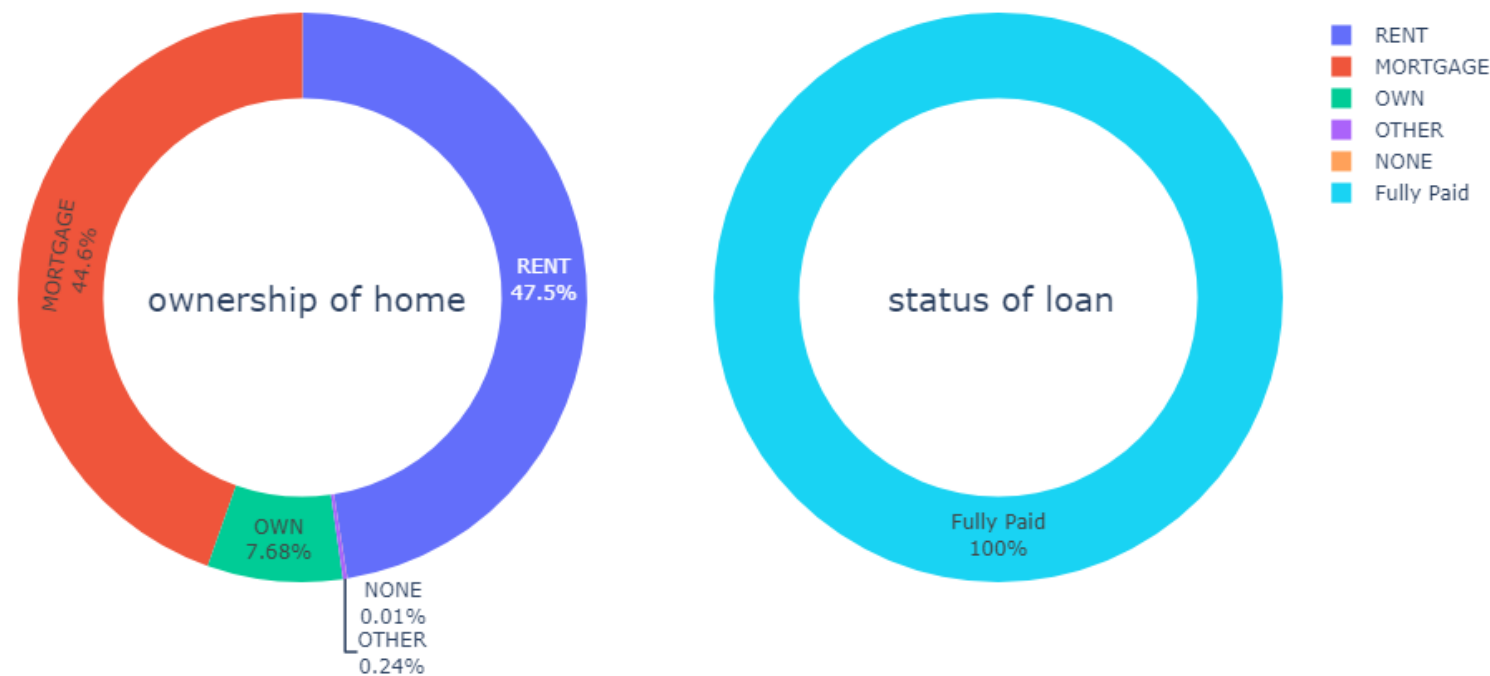
Loan Duration and Length of an employment



- 75% of population prefer loan tenure of 36 months.
- Highest borrowers have an employment length of 10+ years, while borrowers who have an experience less than 1 year has respectable percentage of 12%.
- As the length of an employment increases from 2 to 9 years we see percentage of borrowers are getting reduced.

Home Ownership and Status of loan of Fully paid Borrowers.

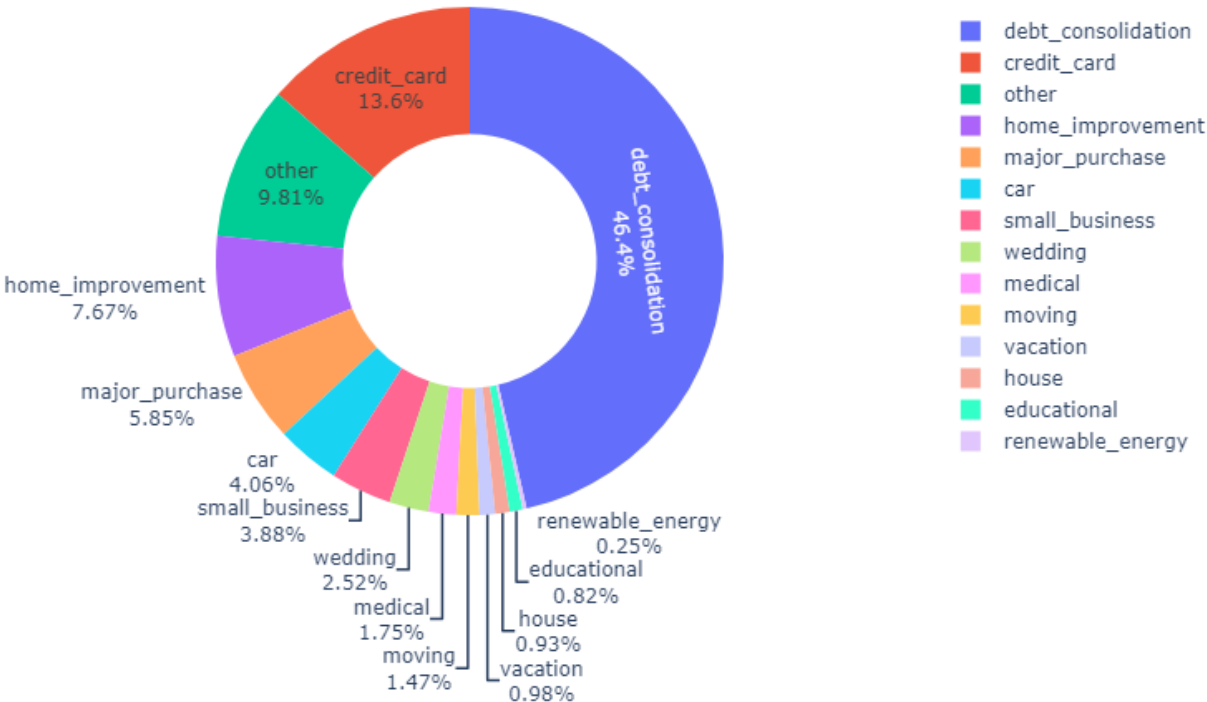
Home Ownership and Status of Loan (Fully Paid)



- Fully Paid borrowers are either staying in rental home or have there home in mortgage.

Purpose of taking loan

Purpose of taking a loan (Fully Paid)

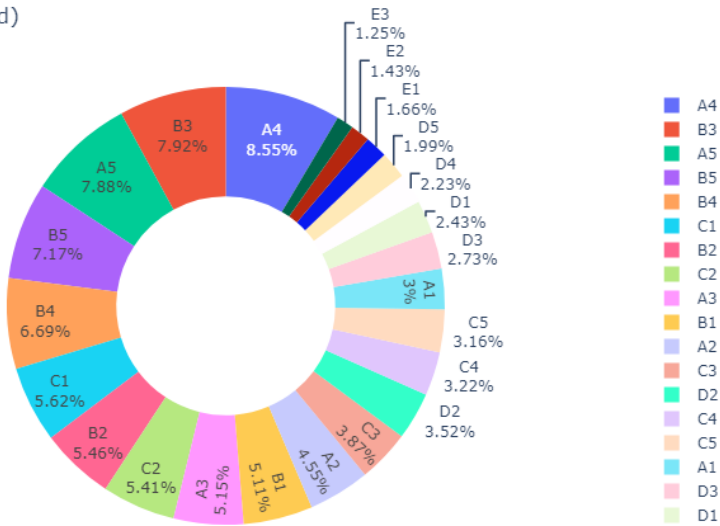


newplot (34)

- People were having loan as debt consolidation or were taking there borrowing was more of a credit loan.
- Rest other type of loan were taken for the lifestyle improvement.
- Lifestyle improvement covers 30.18% in borrowing.

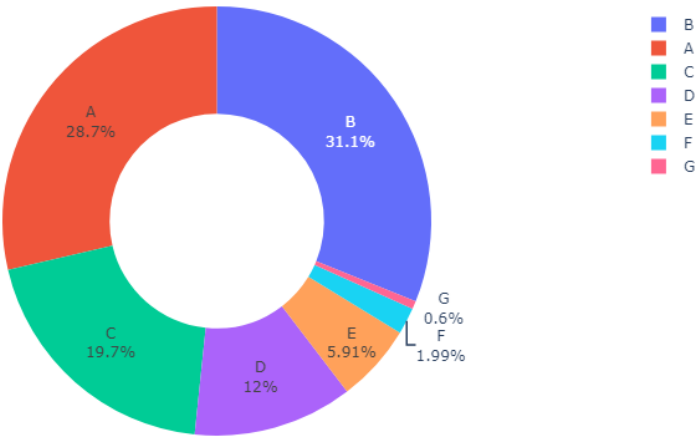
Subgrade of loan and Grade of loan of Fully paid Borrowers

Sub Grade of loan (Fully Paid)



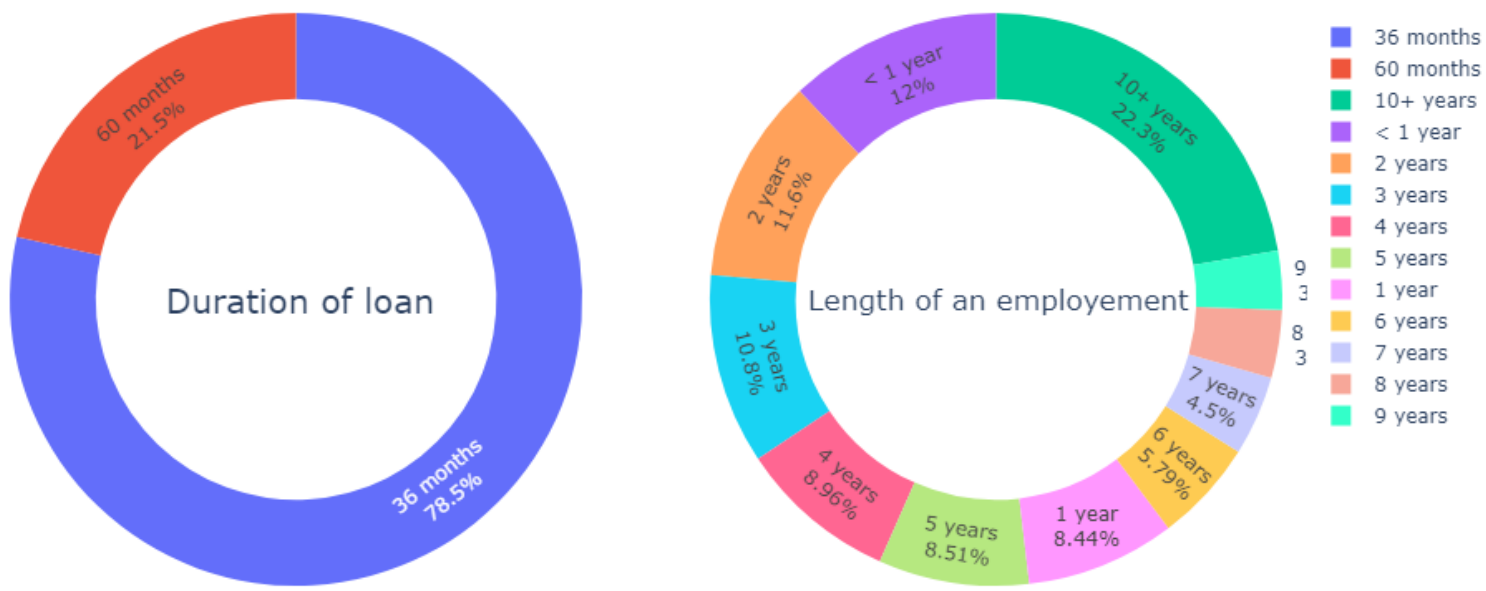
- Quality of Borrowers who are likely to repay there loan is higher. i.e. amount percentage is higher in subgrade.

Grade of loan (Fully Paid)



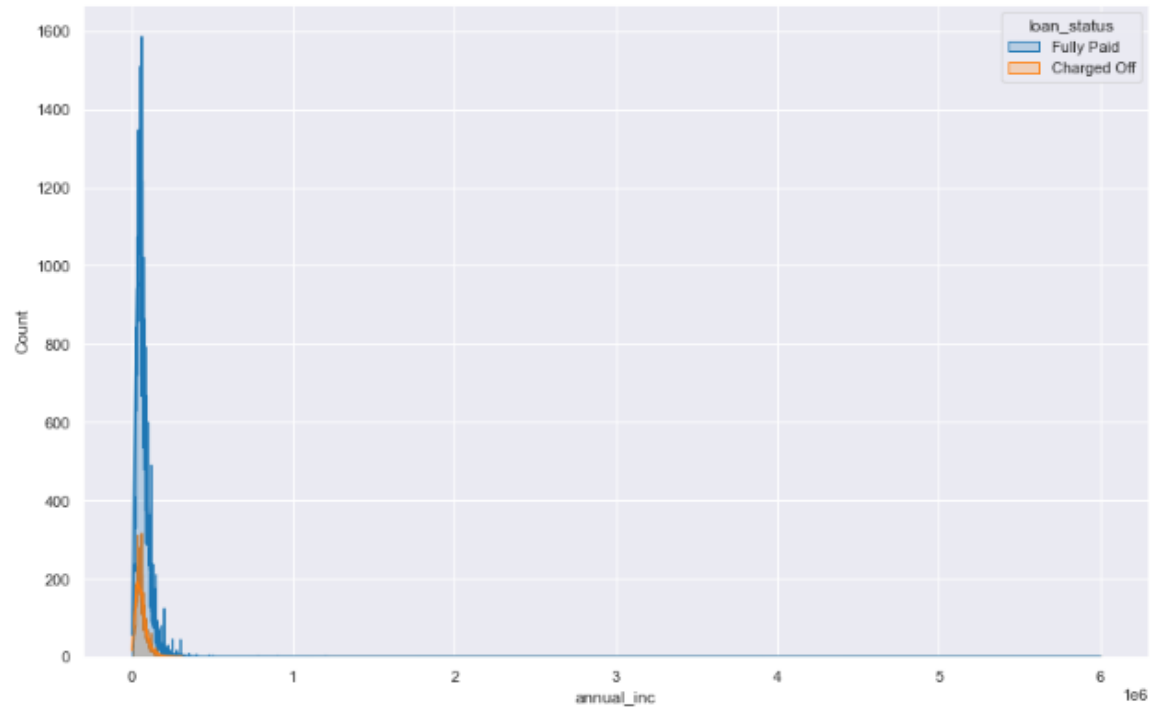
Duration and Length of an employment of fully paid borrowers.

Loan Duration and Length of an employment (Fully Paid)

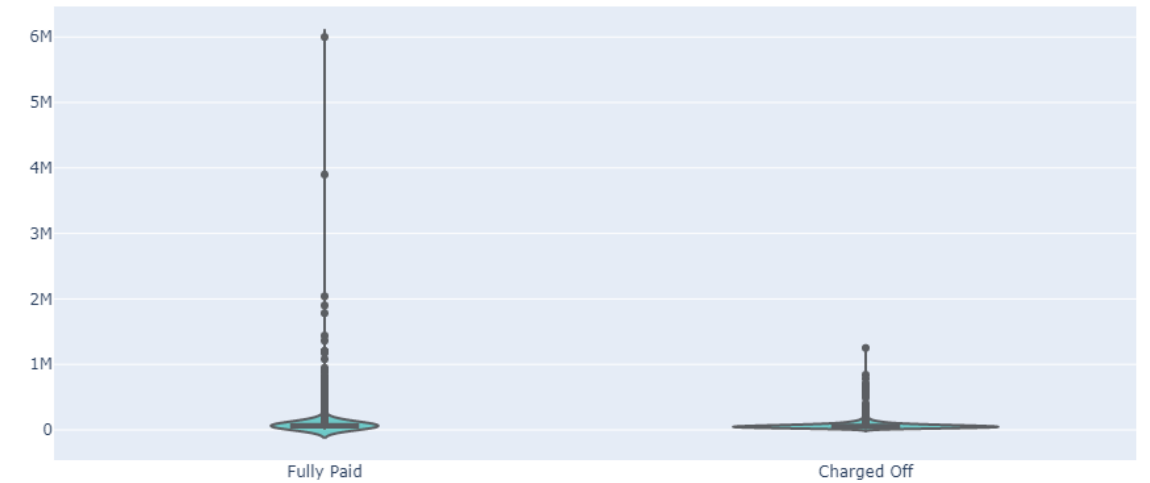


- Fully paid borrowers preferred taking 36 months of loan duration.
- While length of an employment with 10+ years has higher borrowing while borrowing percentage reduce as experience increase from 0 to 10 years, Almost 70% of borrowers are young that is they have an experience of less than 10 years.

Bivariate Analysis

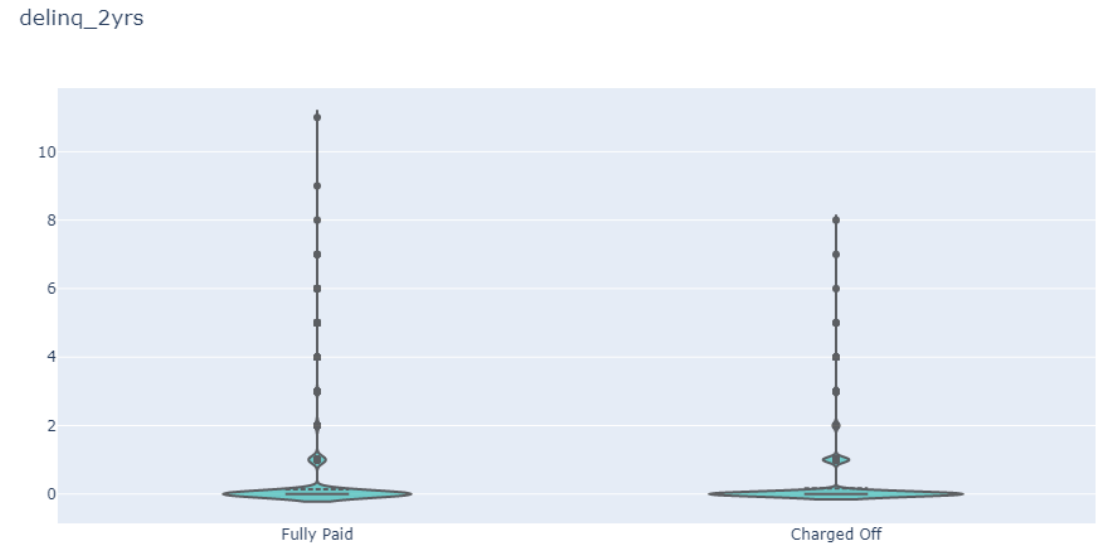
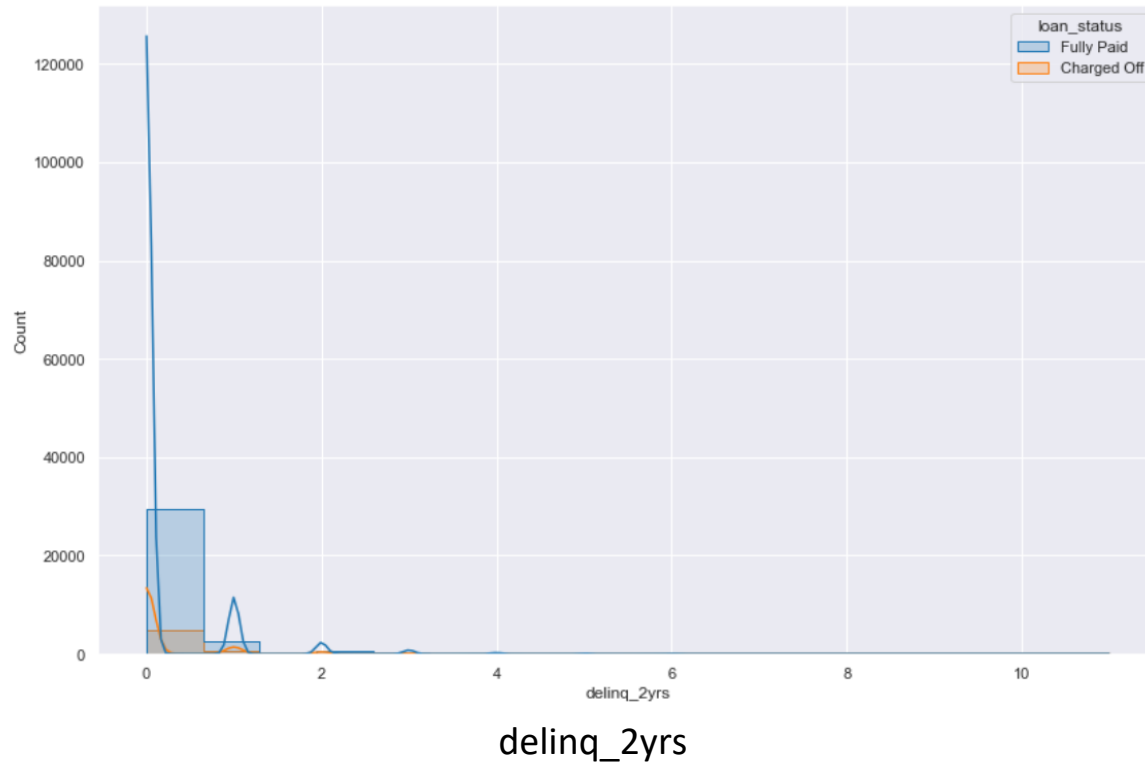


annual_inc



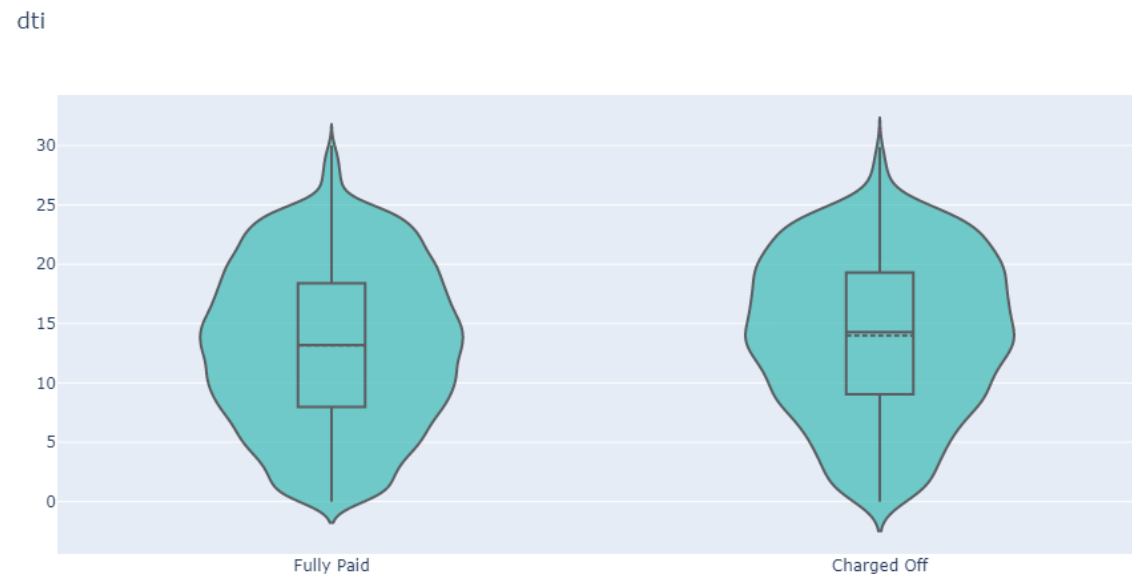
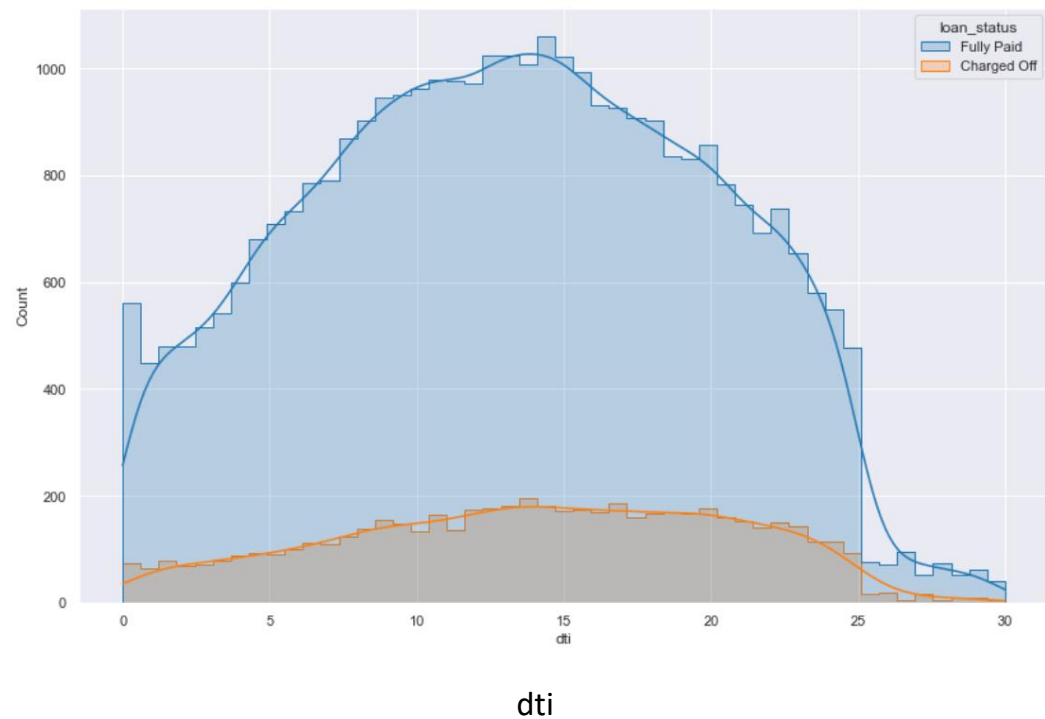
- Borrowers who has fully paid loan has reported higher annual income compared to borrower who are charged off.

Home Ownership and Status of loan



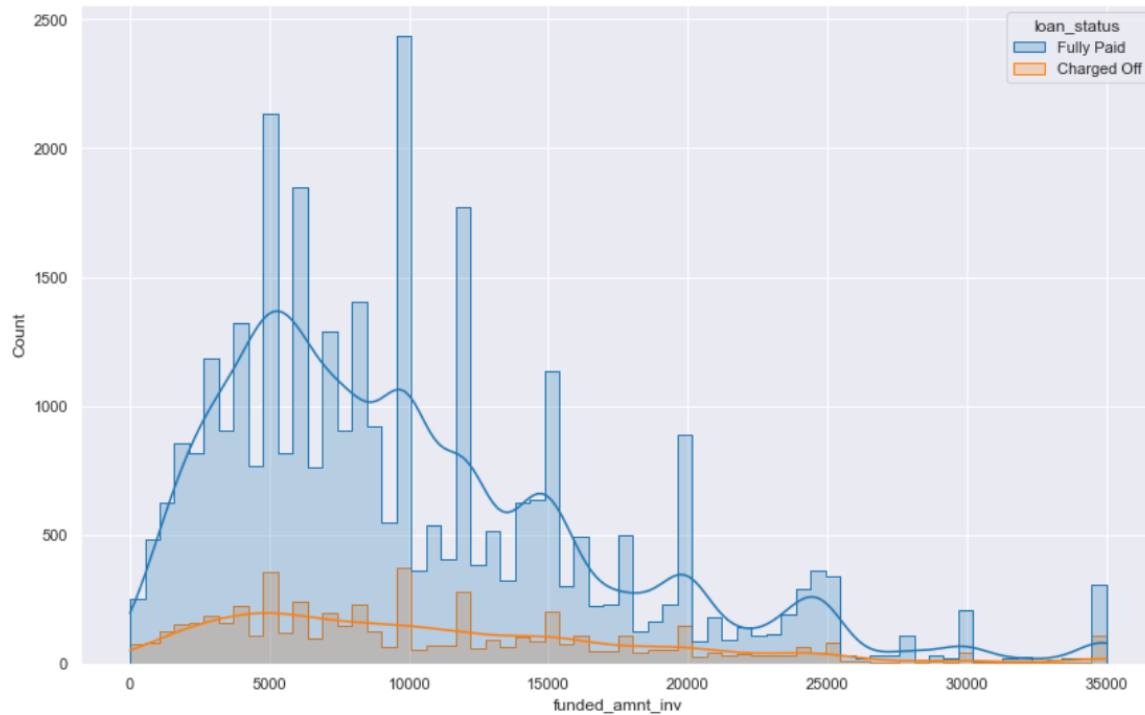
- Delinquency count of fully paid borrowers is higher as compared to charged off borrowers. Even number of delinquencies in a fully paid borrower is higher.

DTI

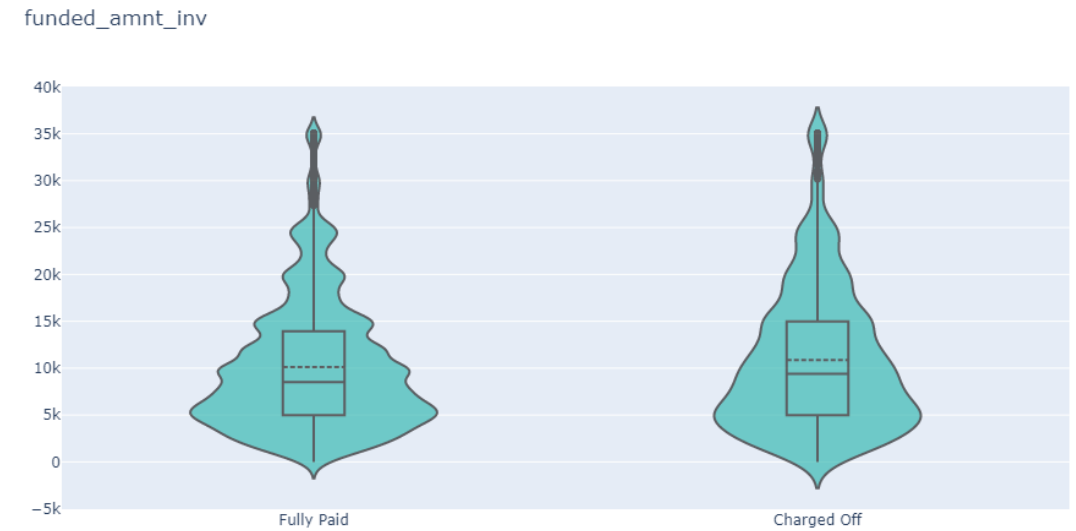


The dti of fully paid borrower is higher compared to charged off borrower.

Amount invested out of total funded amount

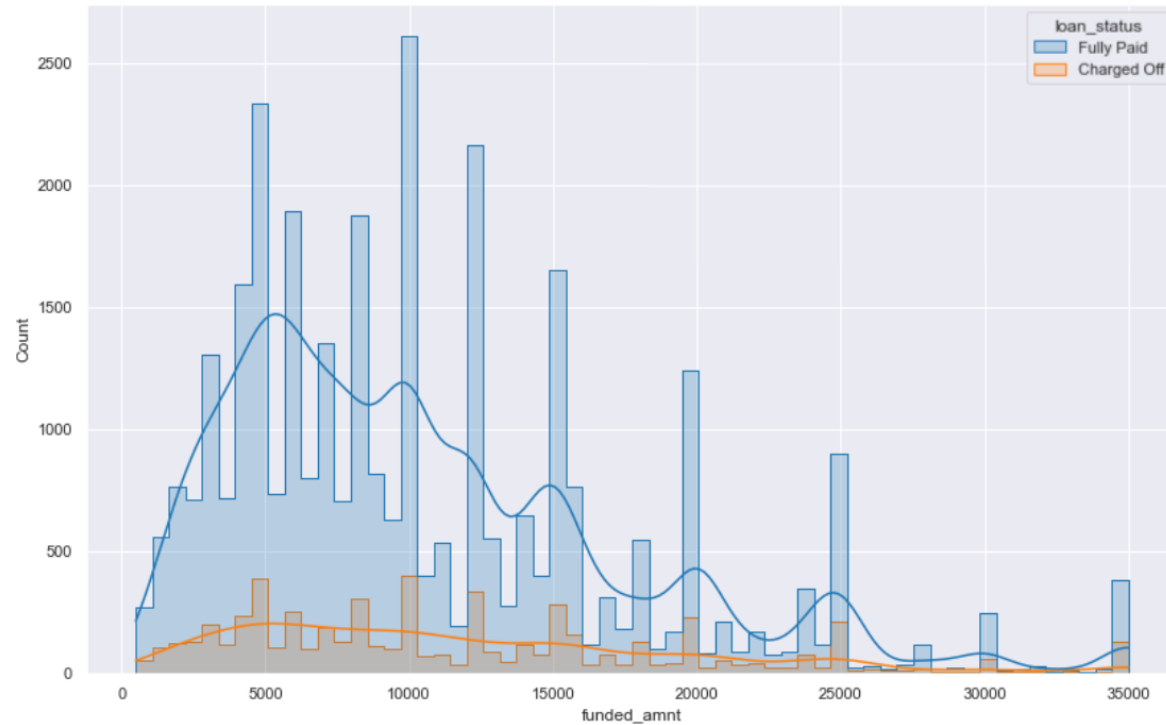


funded amount invested



- Loan Commitment of between 3k to 20k is higher at the time of investor funding.

Total Funded Amount



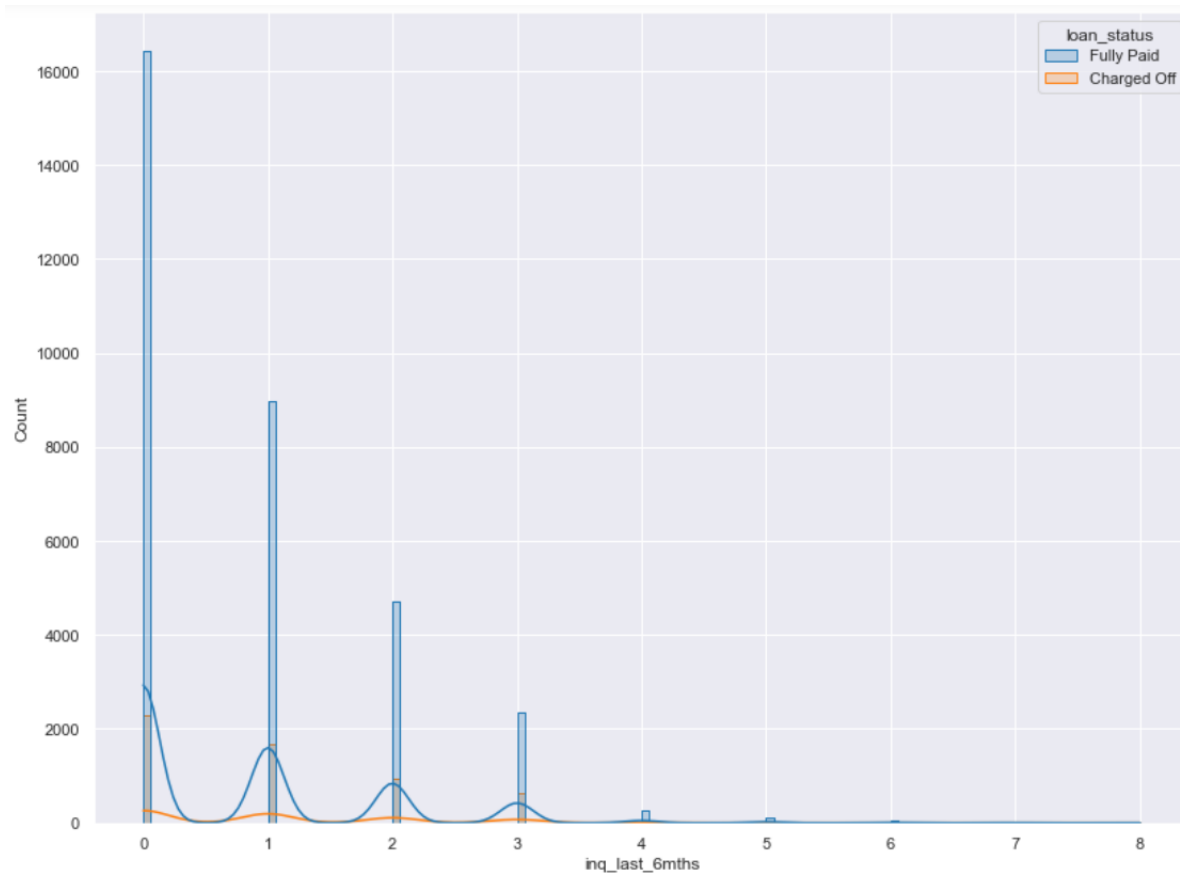
funded amount

funded_amnt



- From the above visualization we can observe that amount funded is lesser than committed, 5k, 10k, 12k commitment counts are higher.

Inquiry count in last six months.



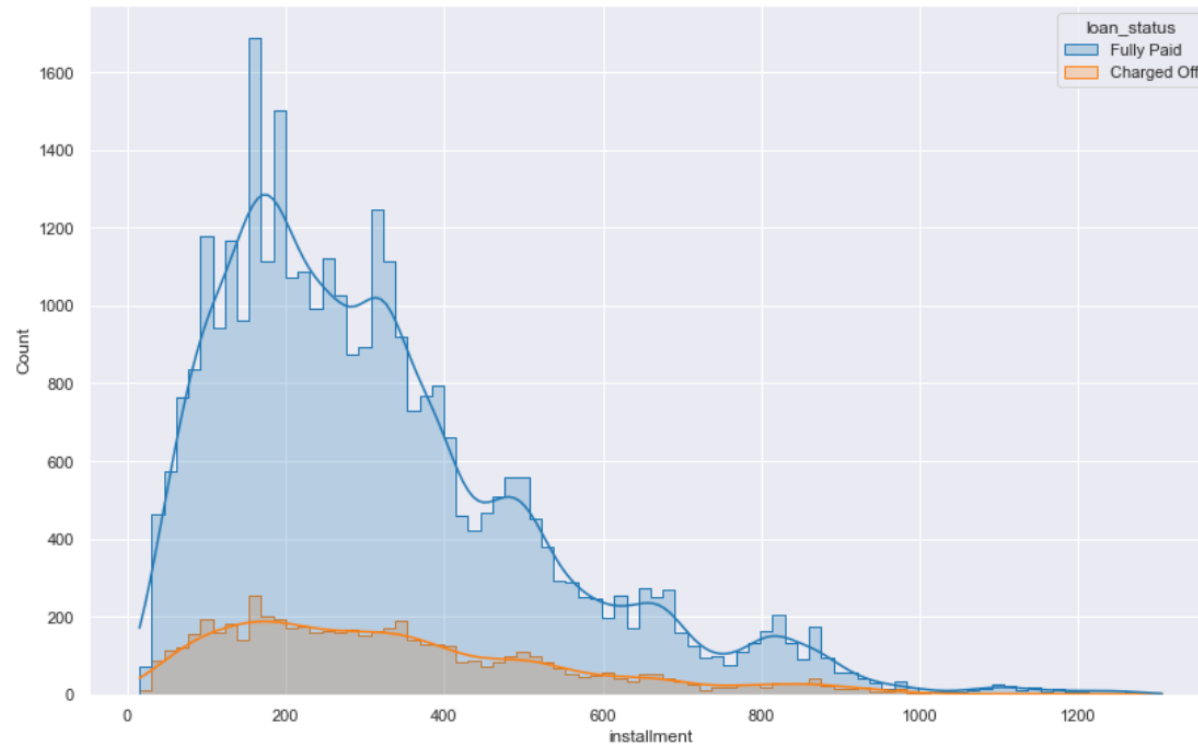
Inquiry last six months

inq_last_6mths



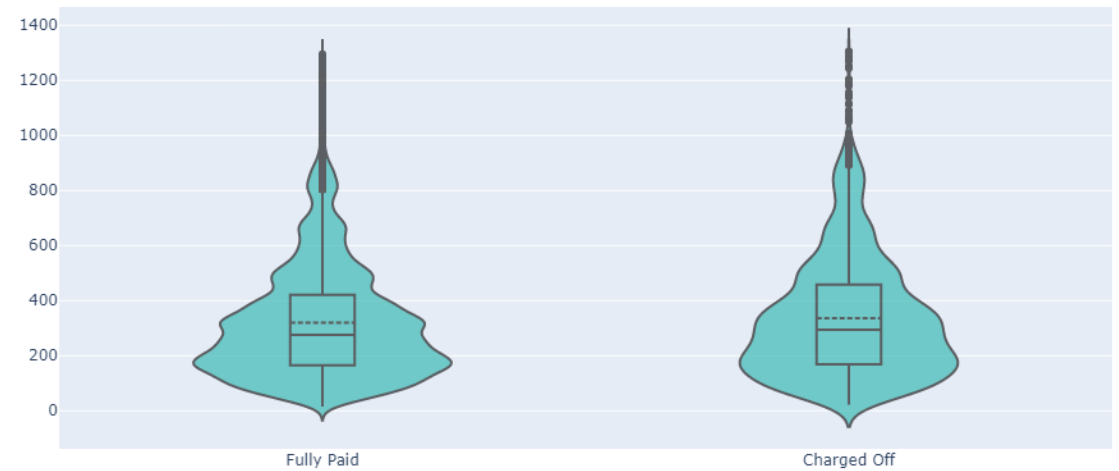
- Fully paid and charged off borrowers every one has done less inquiry for loan. It seems people either need lesser loan or they do not preferred in having frequent loans.

Installments



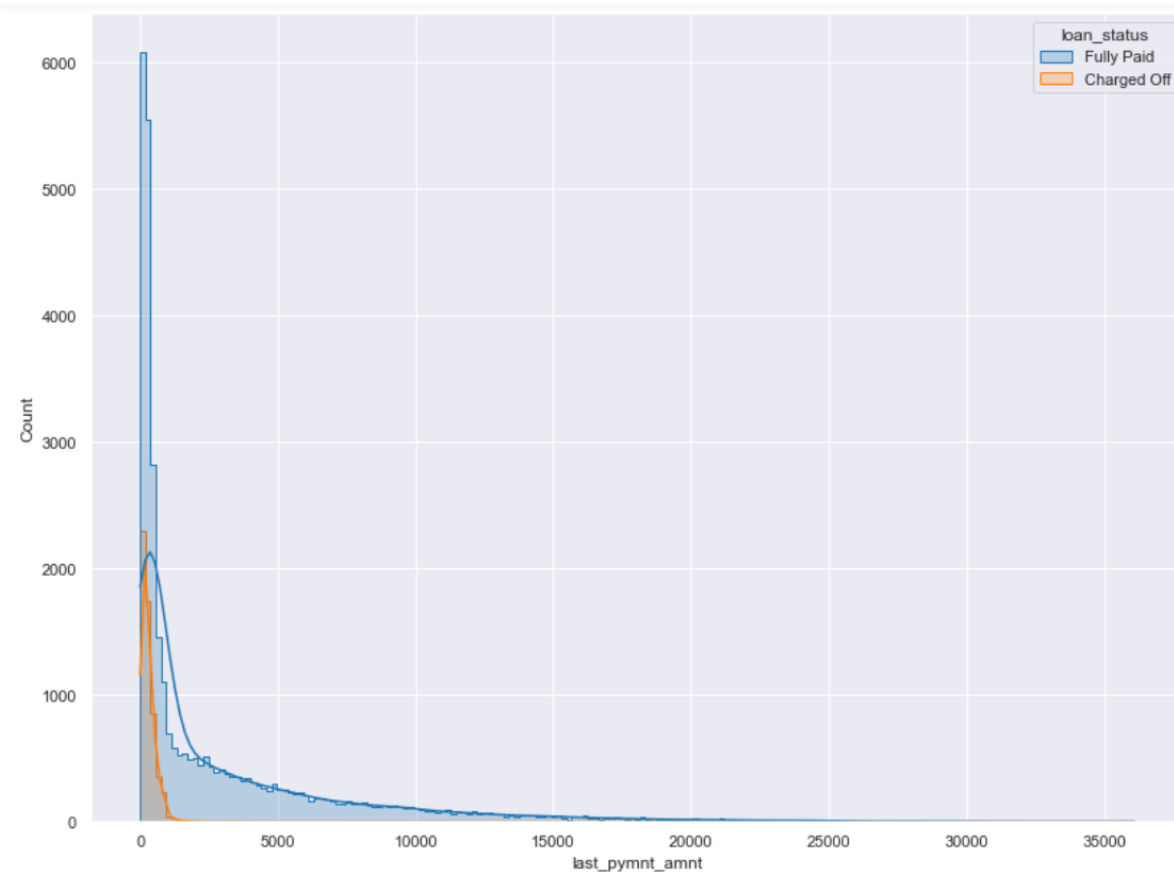
installments

installment

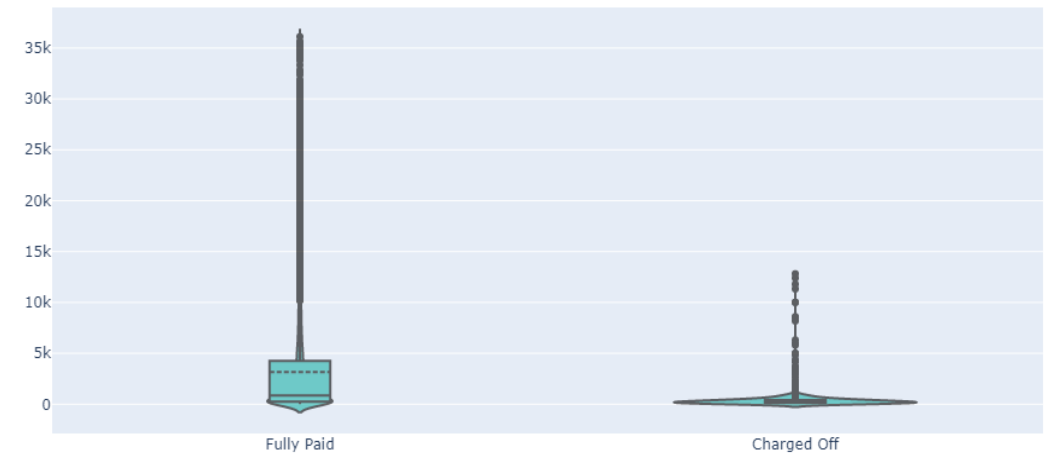


- People who have Fully paid loan they tried to repay there amount in low installment count. They try to repay as soon as possible to avoid higher interest rate.

Last amount paid

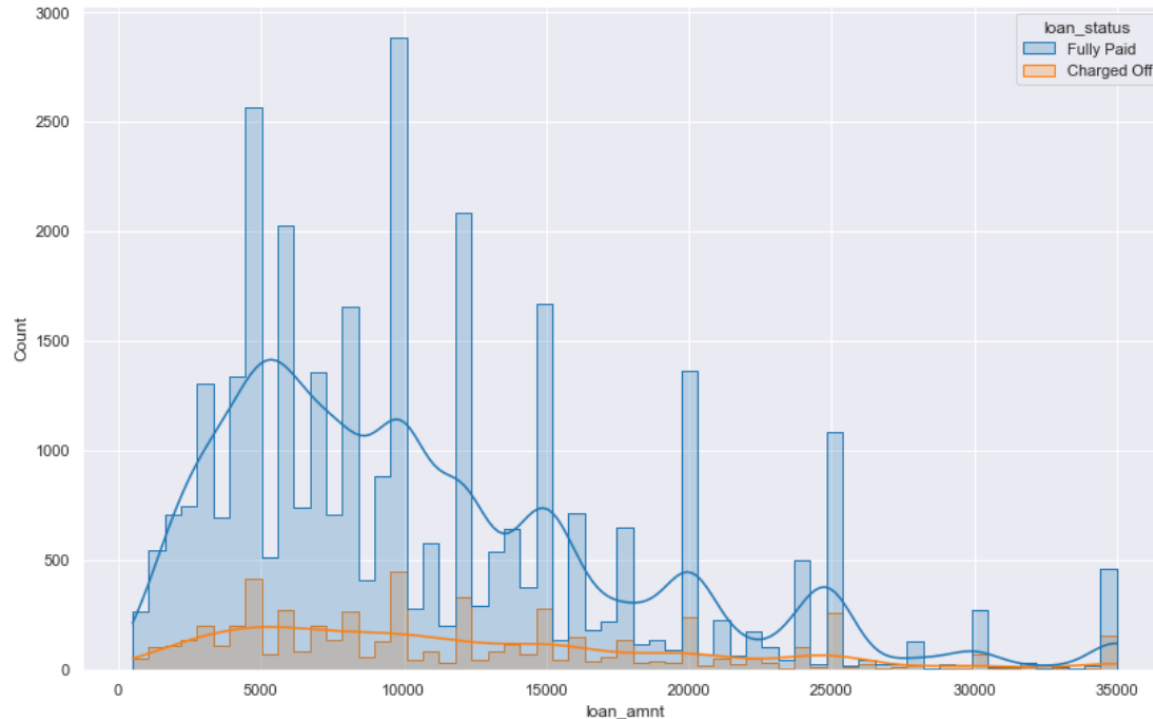


last_pymnt_amnt



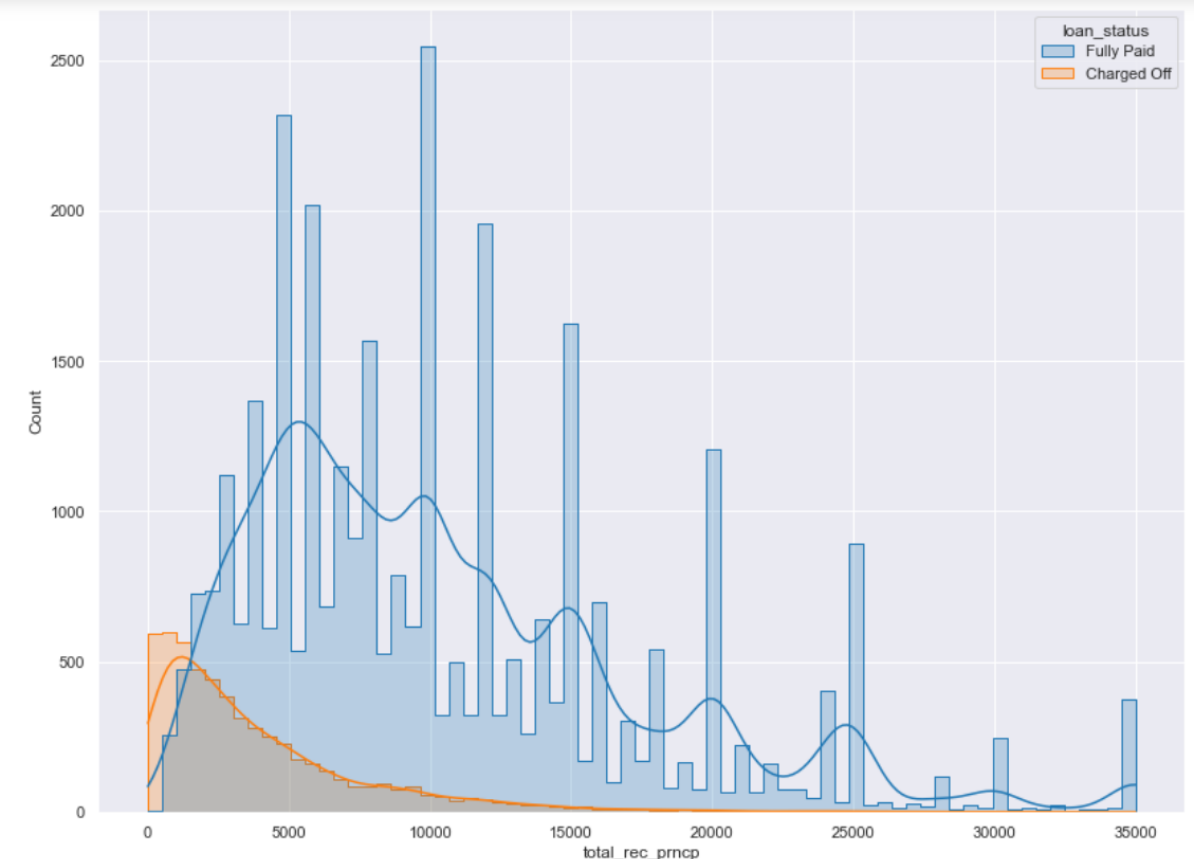
- People Who are charged off has very low amount received during their last payment.

Loan amount and principal received.



Loan Amount

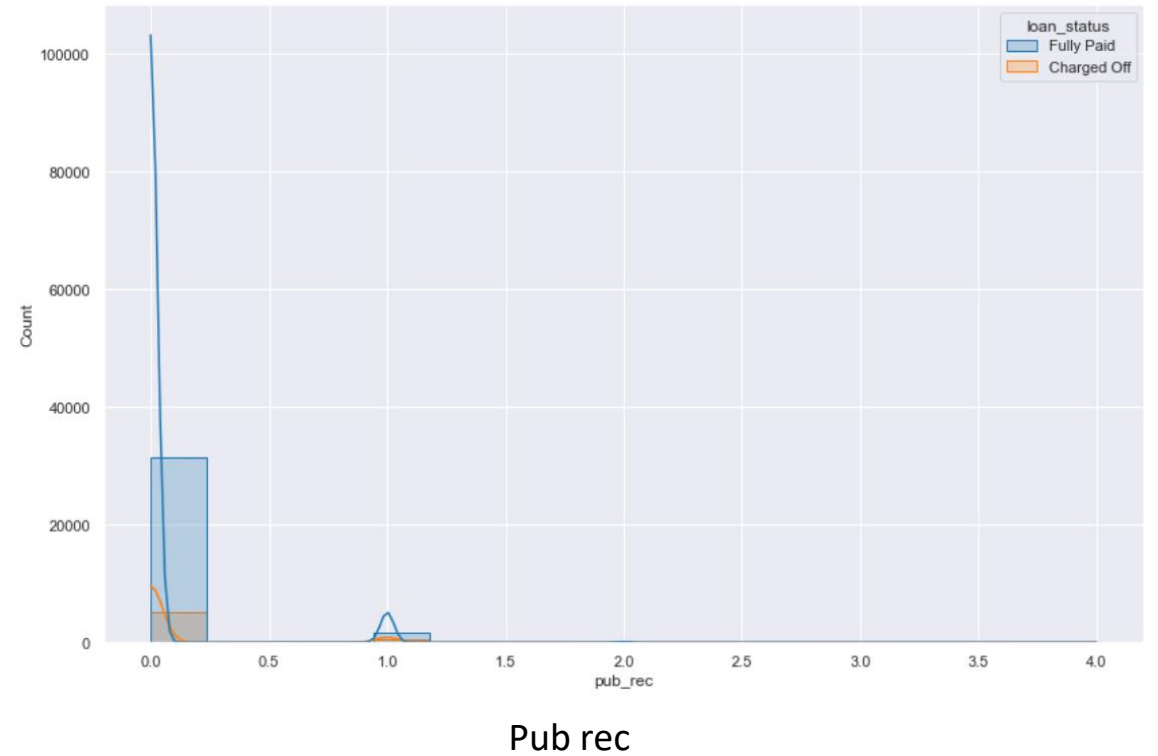
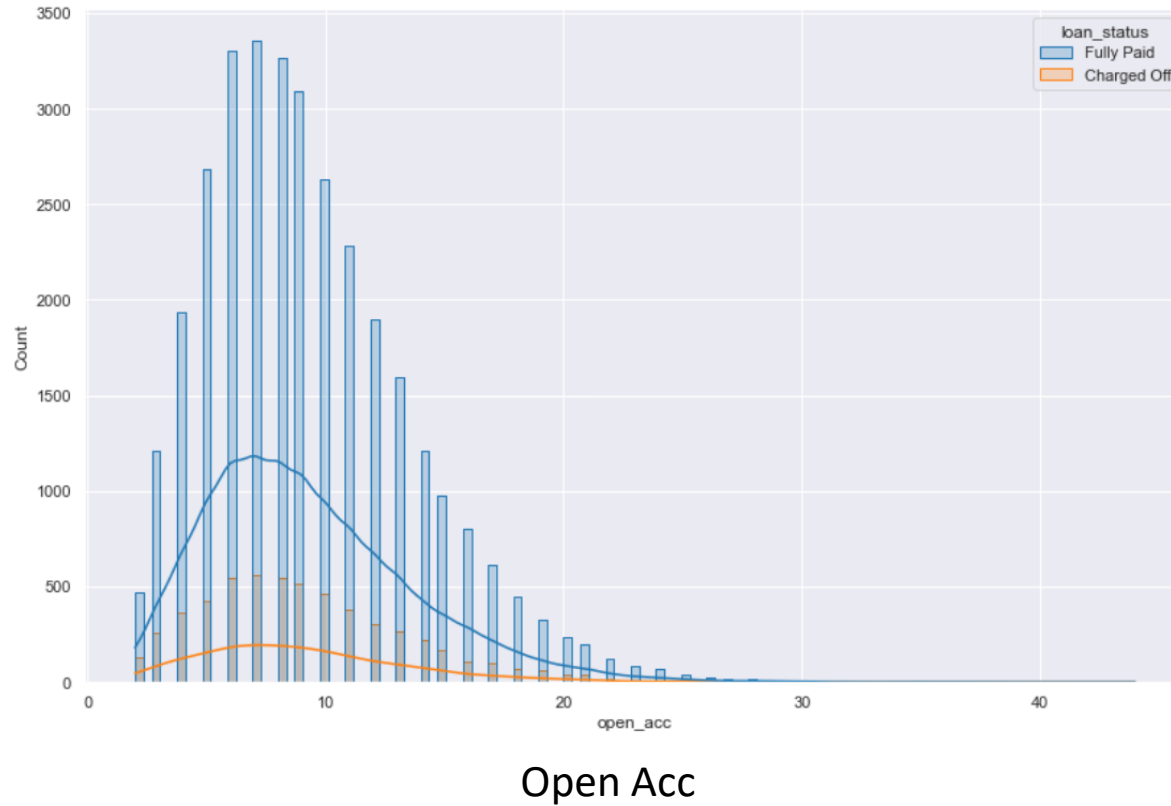
- People preferred taking loan amount in multiplication of five.



Total rec prncp

- Lenders were able to receive more principal amount from fully paid borrowers compared to charged off borrowers.

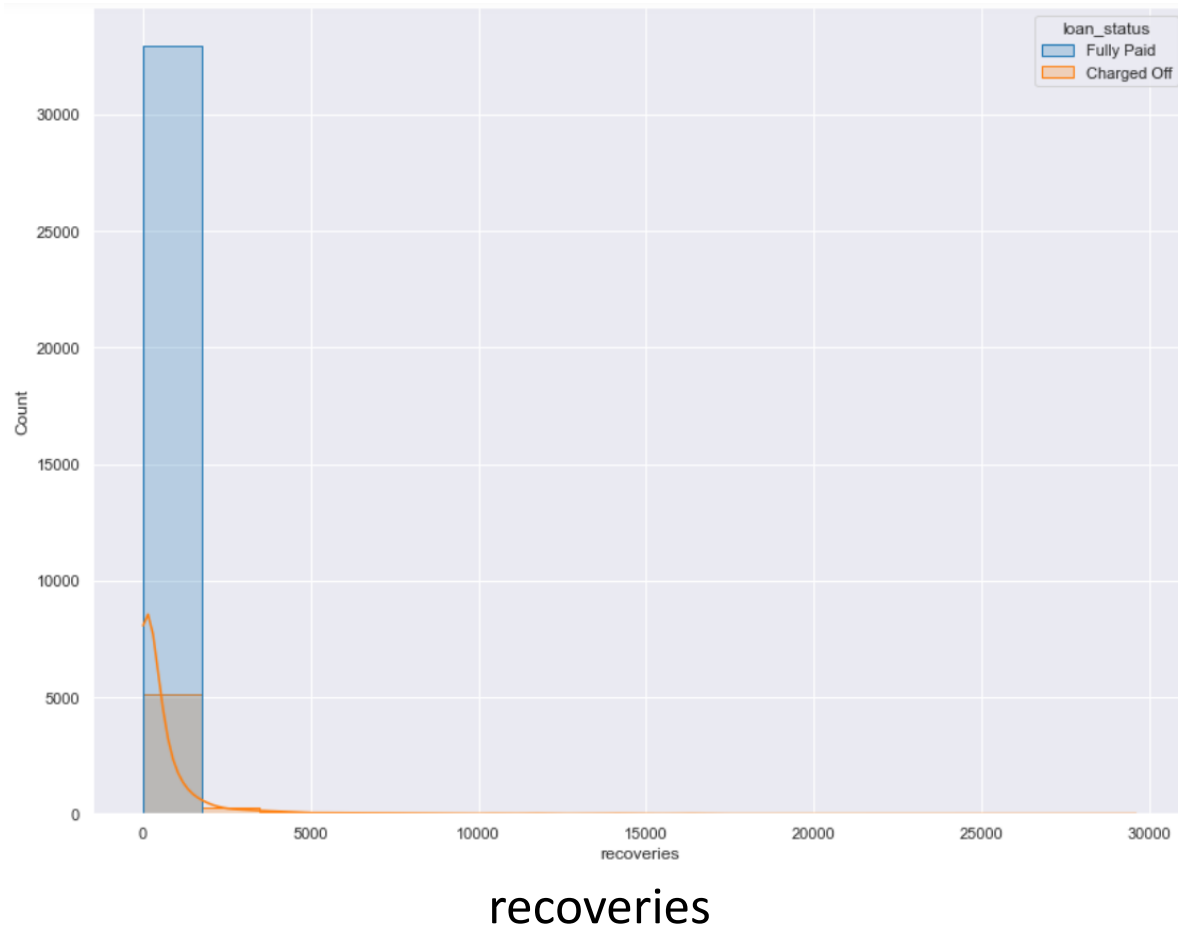
Number account opened and number of derogatory public records.



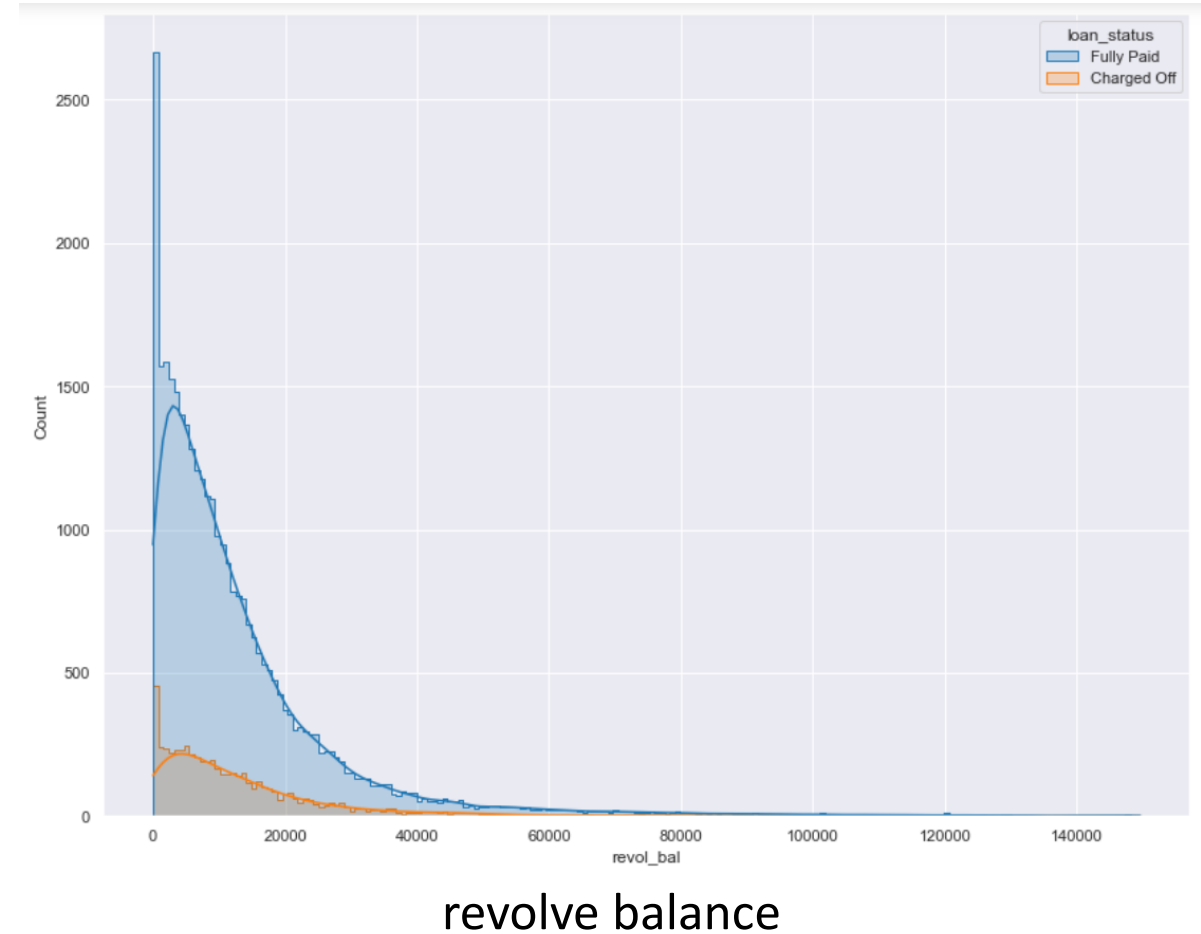
- The number of credit lines in borrowers credit file is between 4 to 10.

- Borrowers generally do not have any derogatory public records.

Recoveries and revolving balance.

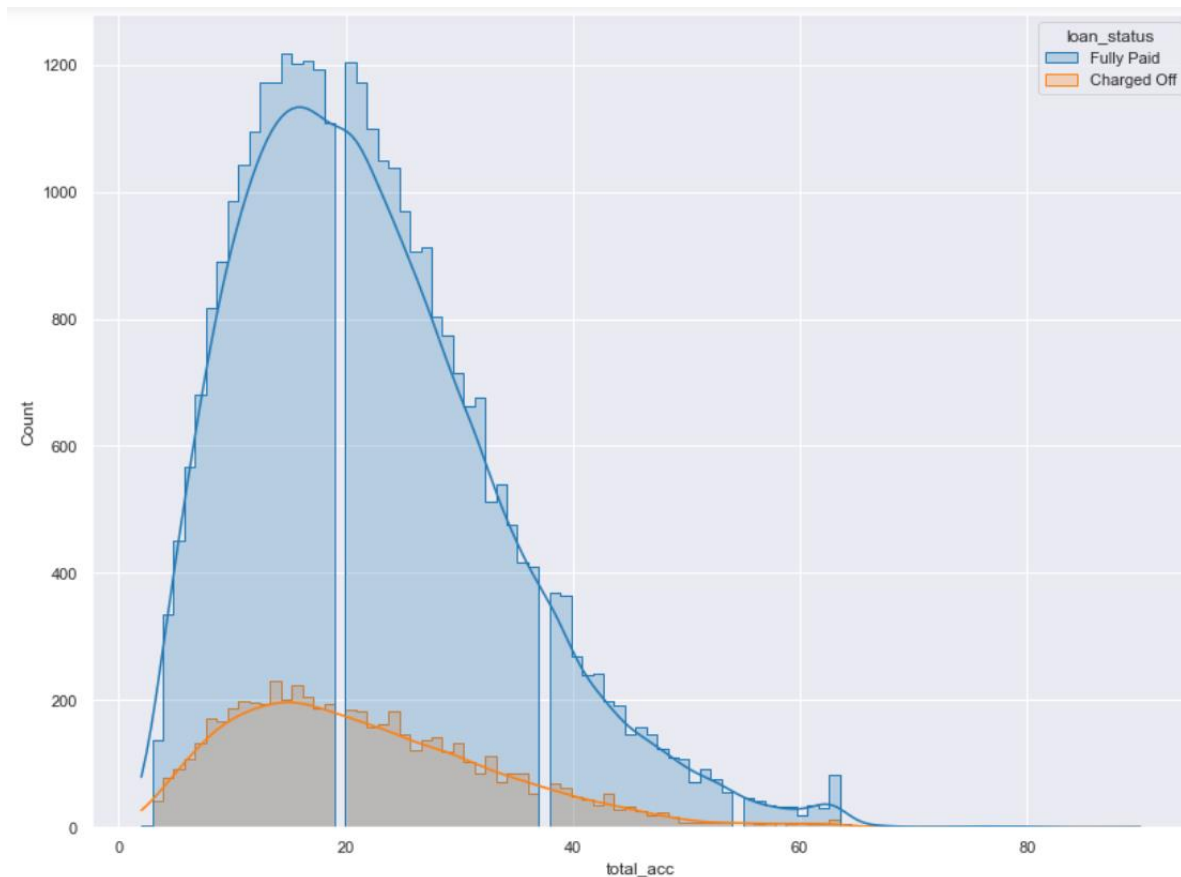


Recoveries in charged off borrower is less compared to fully paid.



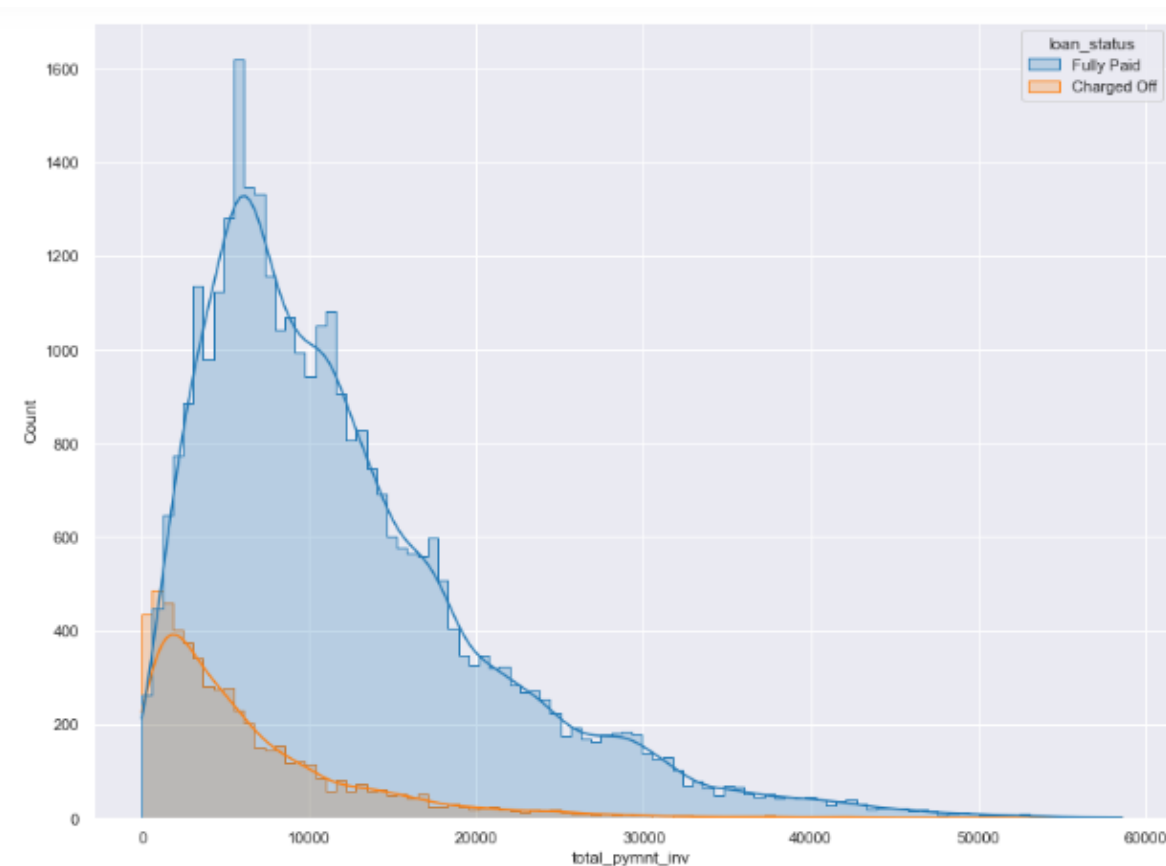
Borrowers who have fully paid their loan are more likely to reutilize their credit.

Total account by borrowers and Total payment invetsed.



Total Account

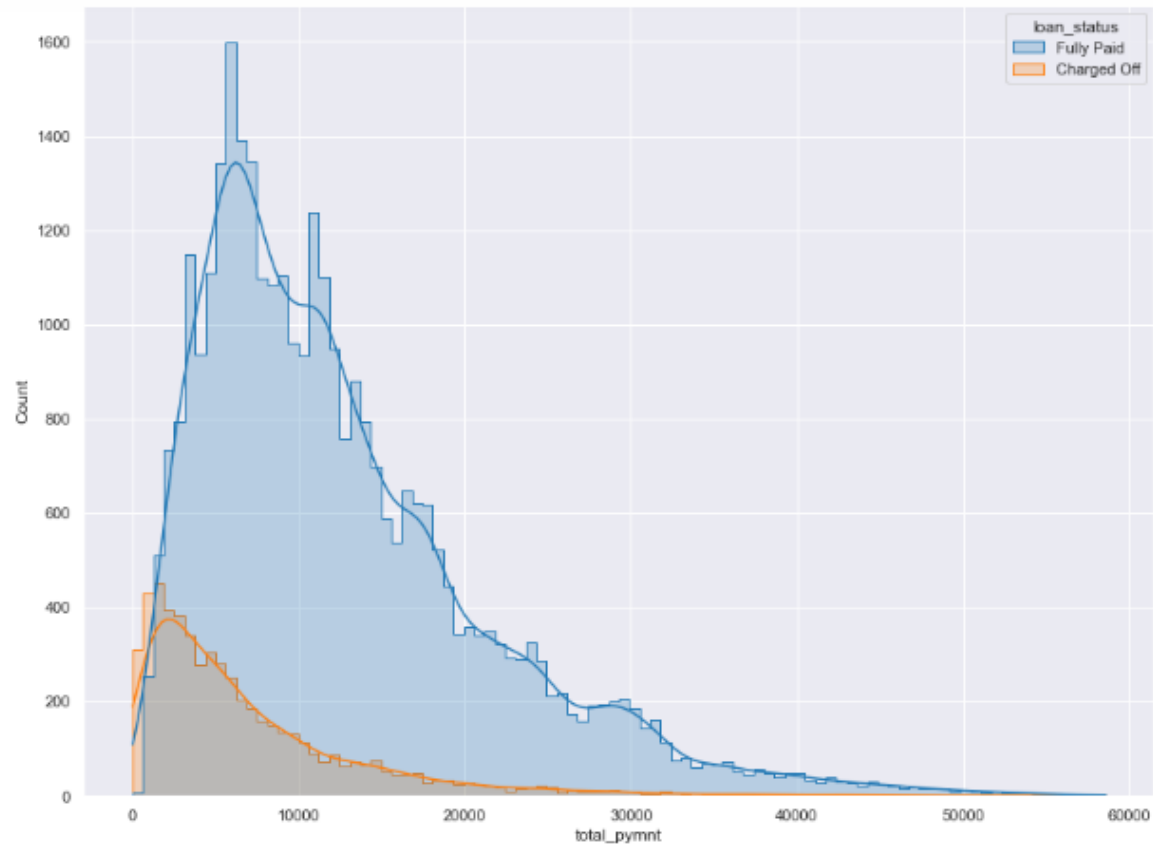
People who has higher credit line are people who repay their loan on time.



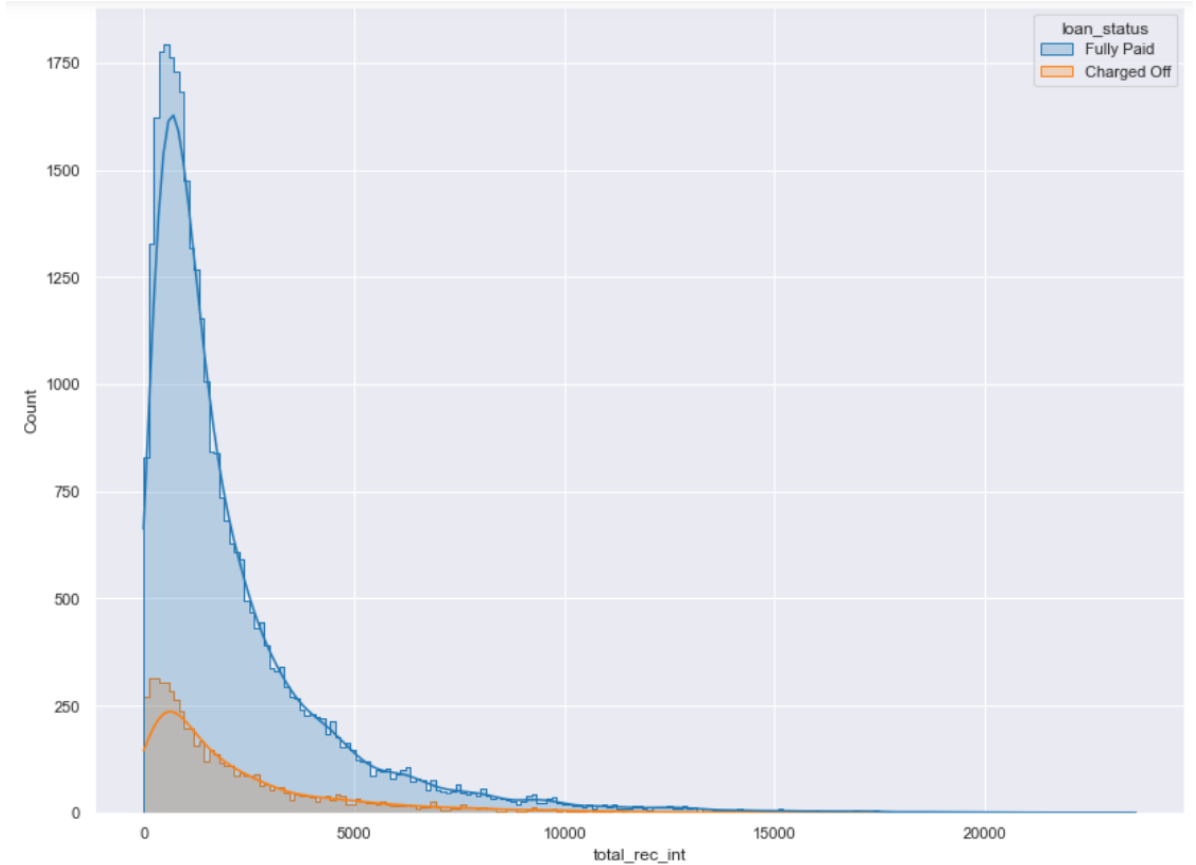
Total Payment invested

Due to repayment of loan by borrower who falls in fully paid categories banks are able to reinvest the money.

Total payment and Total recorded interest.



Total Payment



Total rec interest

Lenders have received more payment in fully paid loan then charged off.

Interest received on Fully paid borrowers is higher compared to charged off.

Recommendation

- We should target for borrowers with an employment length of less than 10 years.
- There is a need to target customers who own their own home.
- We need to address new scheme of loan which help people in Lifestyle Improvement.
- People preferred taking a loan for debt consolidation. We should reduce giving loan for debt consolidation purpose.
- Bank have surplus amount with them due to difference in funded amount by investor and loan funding, We should introduce other loans to utilize bank surplus asset positively.
- Bank too receive surplus money, those money should be utilize to recover the losses by charged off loan.
- We should aim to target for people with good credit history, As we have fewer number of customers falling into the sub grade A1, A2, A3.

Conclusion

- People Who takes loan are more like to stay in rental places.
- They try to pay their loan in less number of installments.
- People prefer taking less frequent loan, that is inquiry for taking new loan is lesser.
- We are able to recover much of the landed money, Interest received is higher and bank is able to stay in profit.
- People who are able to repay their loan are more likely to open new accounts.
- Money received after borrowing is again reinvested for better earning of loans.
- Most borrowers have annual income from 5k to 60k.
- People preferred to take loan for debt consolidation it covers the highest percentage out of total borrowing.
- We are able to recover lot of money out of total landed amount, they should be revolved again in the market by introducing new schemes.