

# LENDING CLUB CASE STUDY

## SUBMISSION

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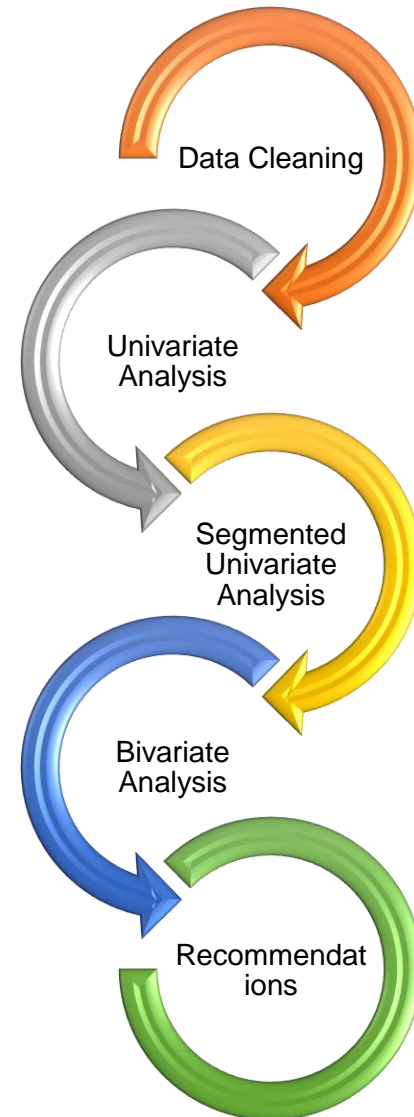
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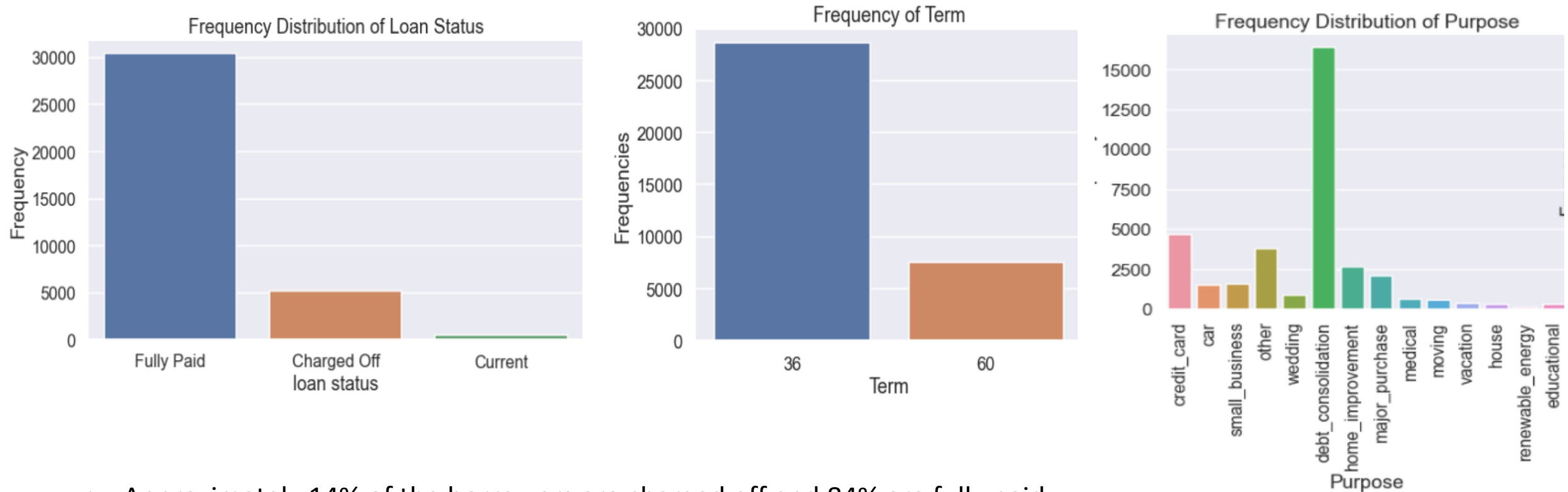
# Abstract

- Lending club is the largest online loan marketplace, facilitating personal loans, business loans, and financing of medical procedures. Borrowers can easily access lower interest rate loans through a fast online interface.
- The main objective of this case study is to analyze the past loan data using EDA and identify the risky loan applicants there by cutting down the amount of credit loss.
- Lending Club wants to understand the driving factors behind loan default, i.e. the driver variables which are strong indicators of default. The company can utilize this knowledge for its portfolio and risk assessment.

# Problem solving methodology

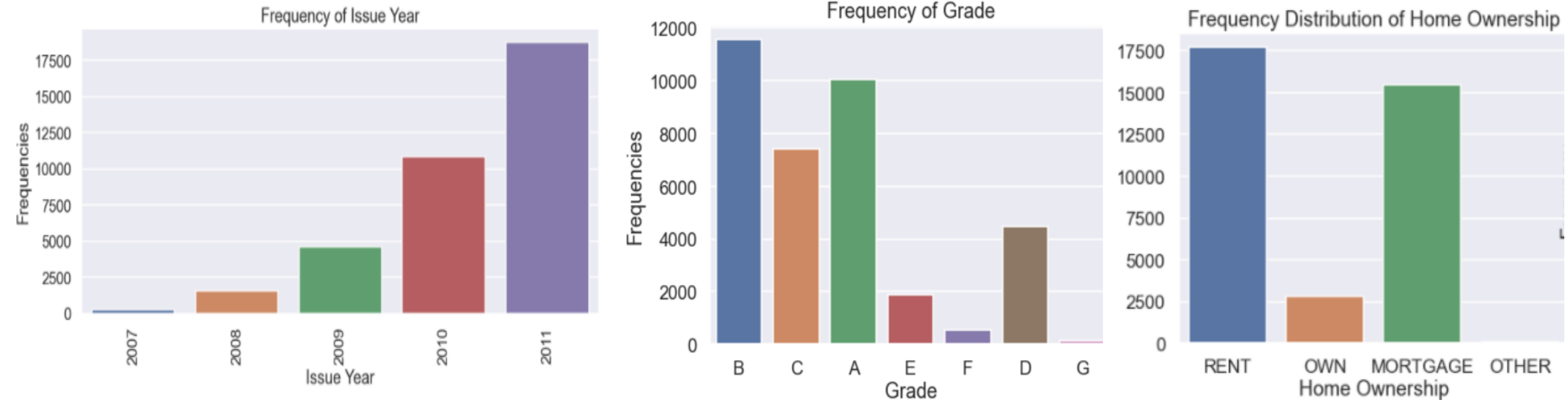


## Analysis – Loan status, Term & Purpose of Loan



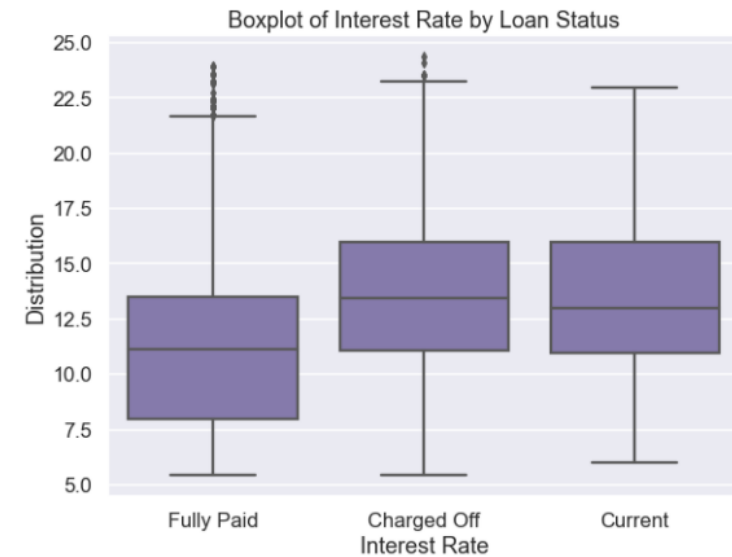
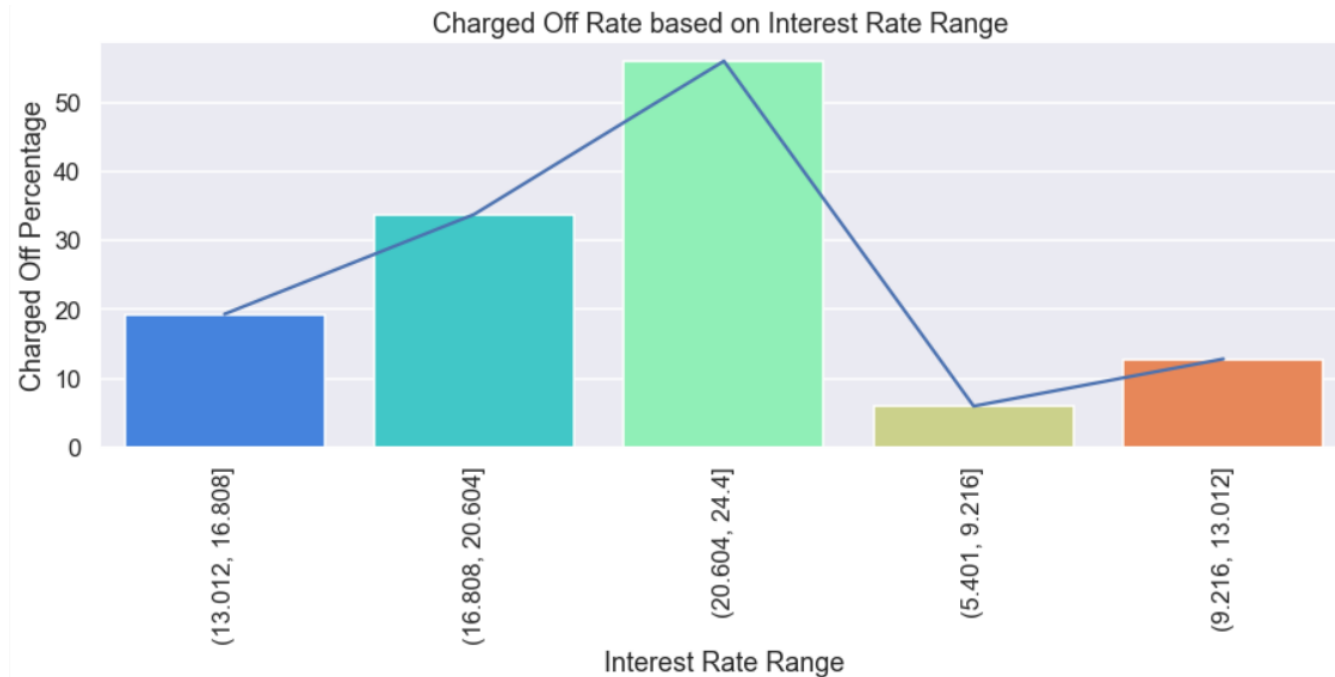
- Approximately 14% of the borrowers are charged off and 84% are fully paid.
- Around 79% of borrowers have taken 36 months term period and 21% have taken 60 months term period
- Maximum number of loans are borrowed for debt consolidation purpose.

## Analysis – Loan issued year, Grade & Home ownership



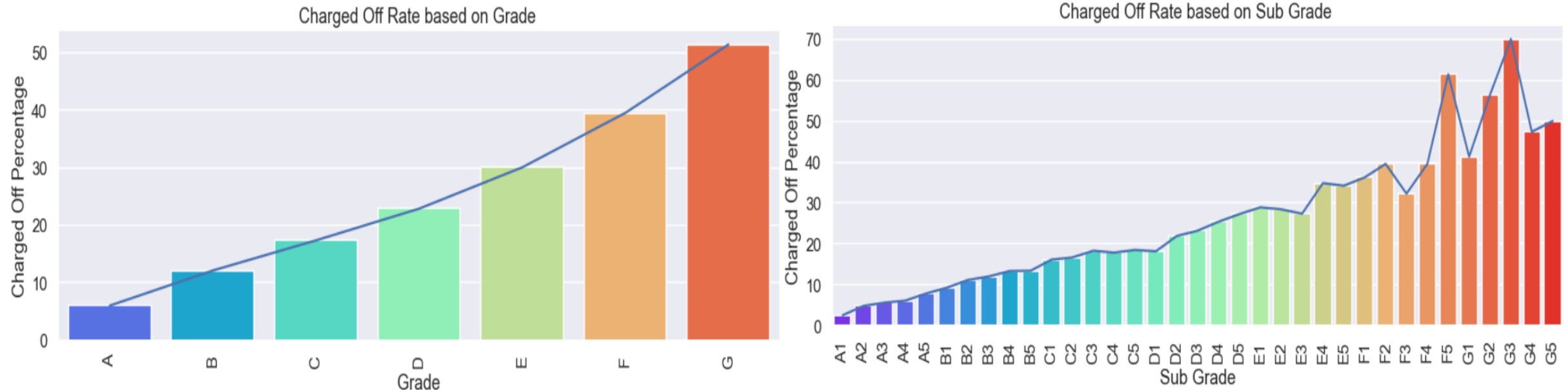
- Number of loans issued by Lending club were gradually increased every year. Highest loans were issued in 2011.
- Maximum number of loans are issued under grade B, followed by grade A.
- Rent and mortgage types of home ownership are the highest loans issued categories.

## Analysis – Loan status vs Interest Rate



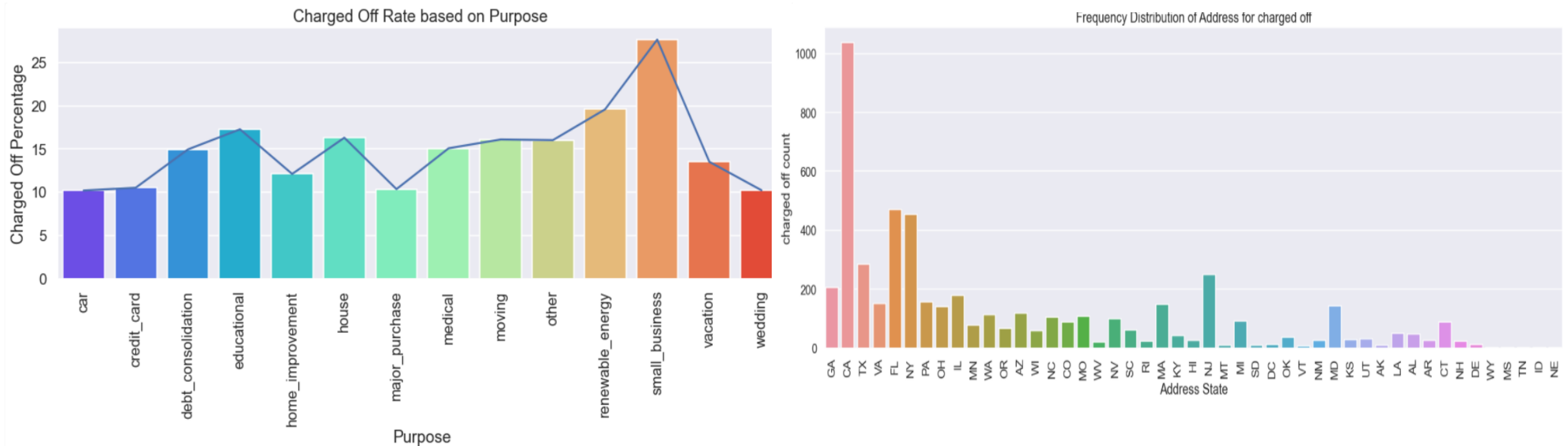
- When there is a high rate of interest, then the higher number of defaulted customers are noted.
- Fully Paid 75% borrowers had interest rate below 13.49% which means that loans with lower interest rates have high chance getting fully paid.

## Analysis – Defaulted by Grade & Sub grade



- ‘G’ and ‘F’ grade loans are the riskiest while ‘A’ and ‘B’ grade loans represent the lowest risk.
- Top 3 Sub Grades which have the highest risk of getting default are : G3, F5 and G2

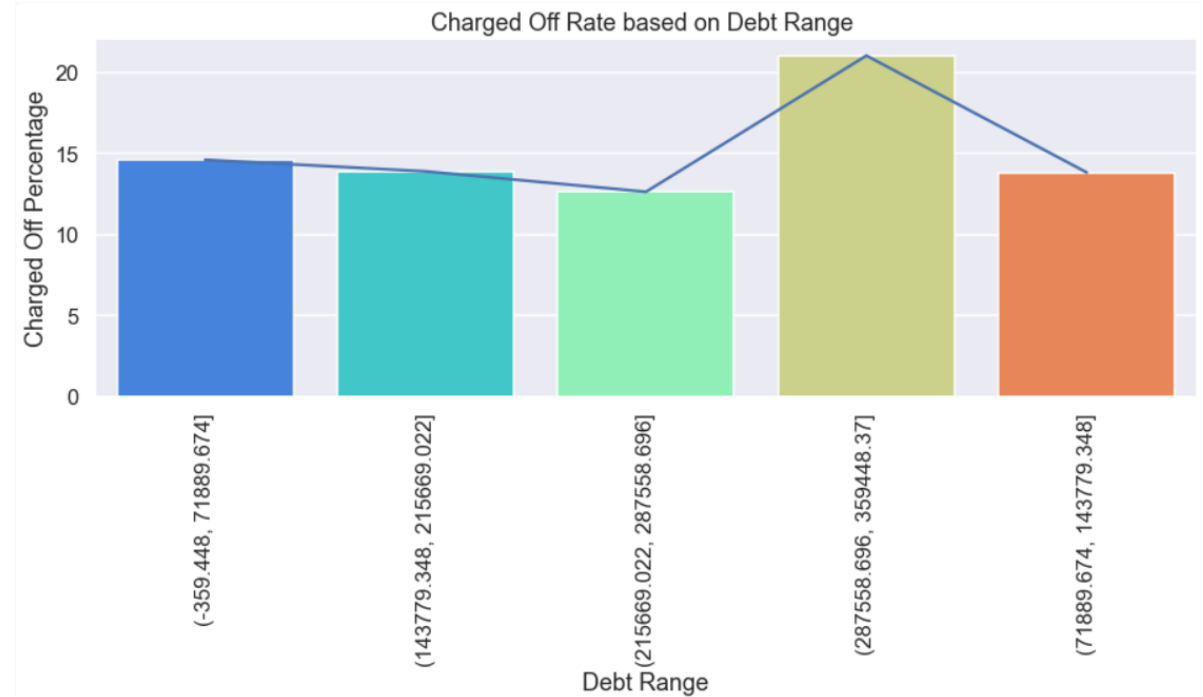
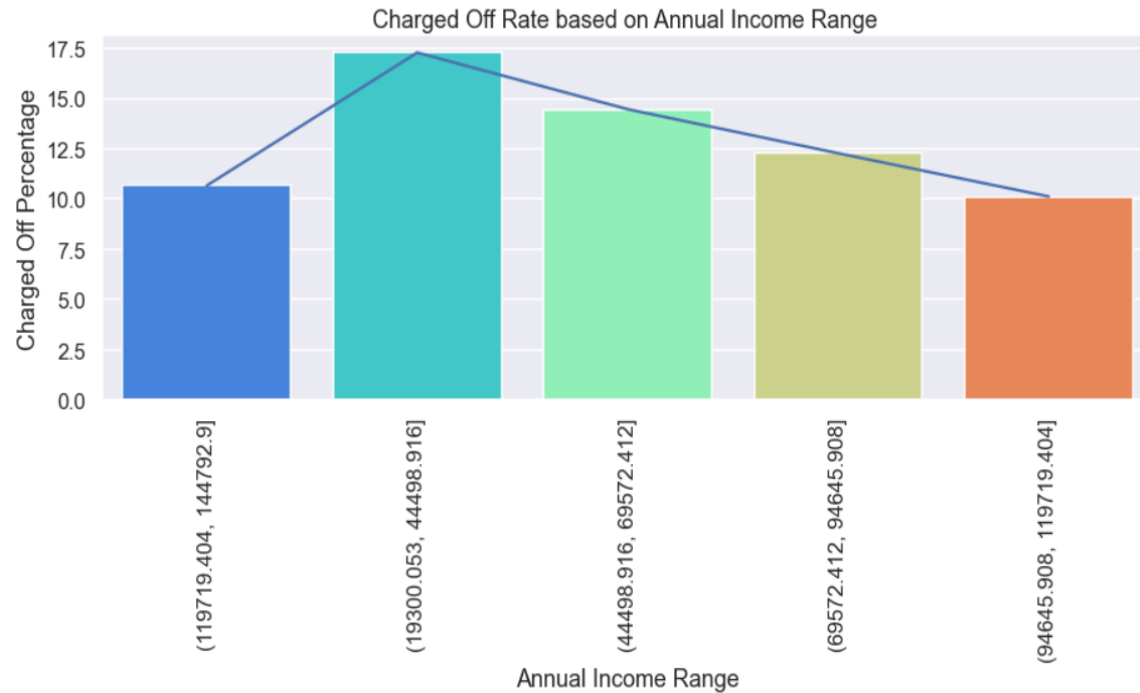
## Analysis – Defaulted by Purpose & Address state



- The highest number of loans are defaulted when taken for small business purpose followed by renewable energy
- The loans which are given for CA, FL and NY state's borrowers are defaulted more than other states.



## Analysis – Defaulted by Annual income & Debt



- Borrowers whose annual income fall in the range of 19300 to 44499 are more likely to get charged off which indicates lower income levels are the riskiest.
- Borrowers who have higher debt amount are more likely to be charged off .

## Analysis – Correlation between multiple variables

1	0.66	0.81	0.78	0.35	0.64	0.58	0.64	0.65	0.68	-total_rec_int
0.66	1	0.89	0.83	-0.085	0.4	0.5	0.42	0.44	0.36	-total_rec_prncp
0.81	0.89	1	0.94	0.079	0.56	0.6	0.58	0.6	0.55	-total_pymnt
0.78	0.83	0.94	1	0.062	0.63	0.53	0.52	0.54	0.51	-total_pymnt_inv
0.35	-0.085	0.079	0.062	1	0.75	0.72	0.81	0.82	0.88	-balance_amt_of_charged_off
0.64	0.4	0.56	0.63	0.75	1	0.82	0.88	0.9	0.89	-funded_amnt_inv
0.58	0.5	0.6	0.53	0.72	0.82	1	0.92	0.95	0.9	-installment
0.64	0.42	0.58	0.52	0.81	0.88	0.92	1	0.98	0.96	-loan_amnt
0.65	0.44	0.6	0.54	0.82	0.9	0.95	0.98	1	0.98	-funded_amnt
0.68	0.36	0.55	0.51	0.88	0.89	0.9	0.96	0.98	1	-total_inst
total_rec_int	total_rec_prncp	total_pymnt	total_pymnt_inv	balance_amt_of_charged_off	funded_amnt_inv	installment	loan_amnt	funded_amnt	total_inst	

For charged off borrowers we can see small clusters formulating :

- Total Received Interest, Total Received Principal, Total Payment & Total Payment Investors have high positive correlation.
- Total Received Interest, Funded Amount Investor, Installment, Loan Amount, Funded Amount and Total Installment forms a cluster of high positive correlation.
- Above statements show that Any increase in one of these KPIs increases the total received interest.

## Conclusions

Lending club can reduce the charged off customers by considering below points:

- Reducing the high interest rates.
- Reducing or stopping the loan approvals for small business purpose.
- Proper review of information from borrowers before approving grade G and F loans and particularly for G3, F5 and G2 sub grade loans.
- Reducing the number of approved loans for borrowers who are from states CA, FL and NY.
- Reducing the loan approvals for borrowers whose annual income is low and debt is high.