



Lending Club Case Study

Group Members:

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Agenda

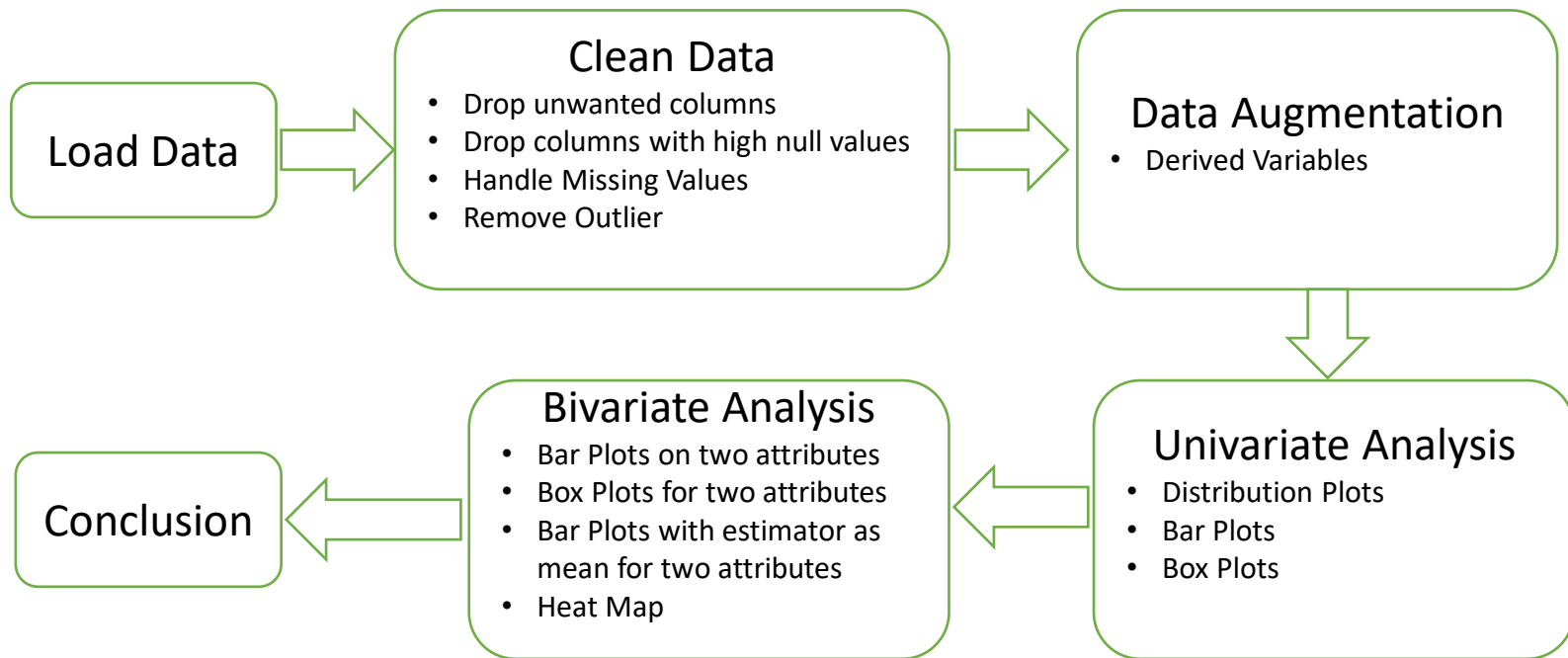
- Problem Statement
- Analysis Approach
- Recommendations

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

Lending loans to 'risky' applicants is the largest source of financial loss (called credit loss). 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'.

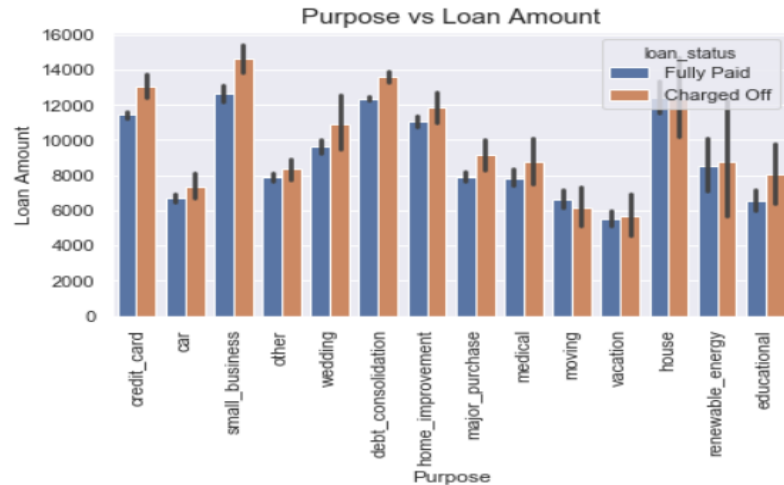
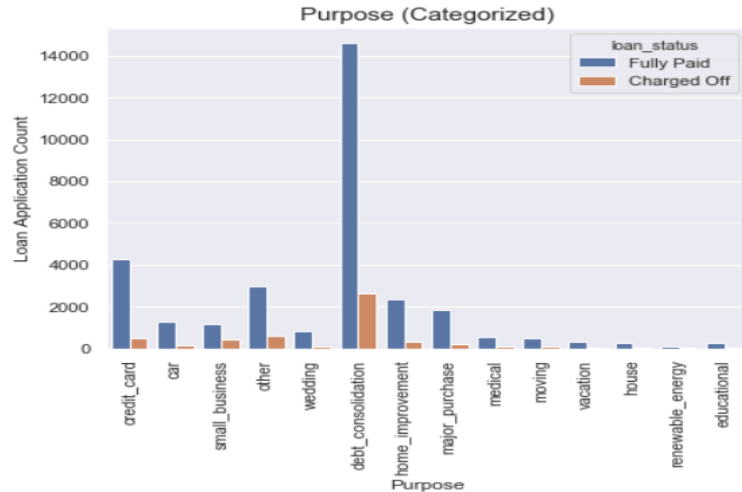
The company wants to understand the driving factors (or driver variables) behind loan default, i.e. the variables which are strong indicators of default. The company can utilise this knowledge for its portfolio and risk assessment.



Major variables affecting the loan charge off rate are as below,

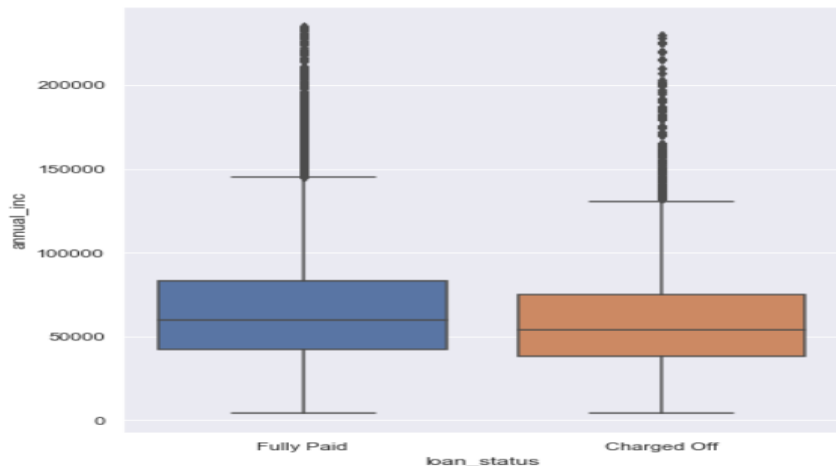
1. Loan Purpose
2. Annual Income
3. Interest Rate
4. Term
5. Employment Length
6. Grade
7. Debt to Income Ratio
8. Address State
9. Pub Rec Bankruptcies
10. Pub Rec

Lending Club: Analysis (Loan Purpose)

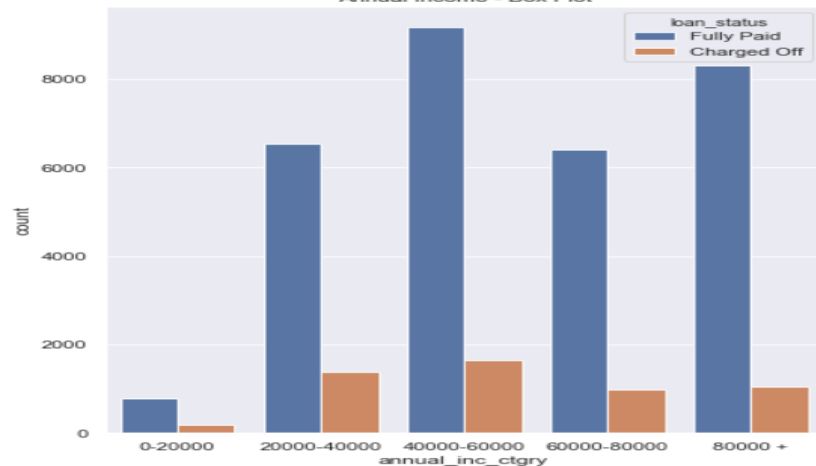


- debt consolidation, credit card, small business, other have a greater number of charged off loan, this may be due to higher numbers of loan disbursed for the same. These also have highest average loan amount that was charged off.
- Highest percentage is default is seen for Small Business, Renewable Energy, House.

Annual Income distribution



Annual Income - Box Plot

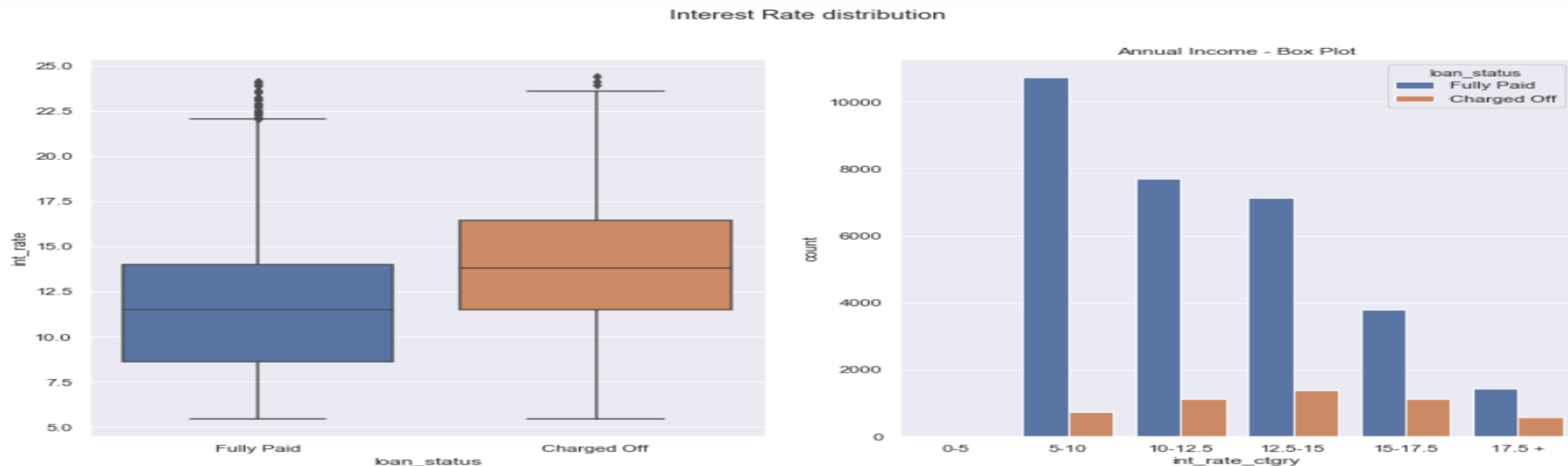


Charged off loan is inversely proportional to Annual Income. As the Annual Income increases charged off loan rate decreases. Charged off rate is highest for 0-20000 income category and decreases with increase in income.

0-20000 - 19.03%

20000-40000 - 17.46%

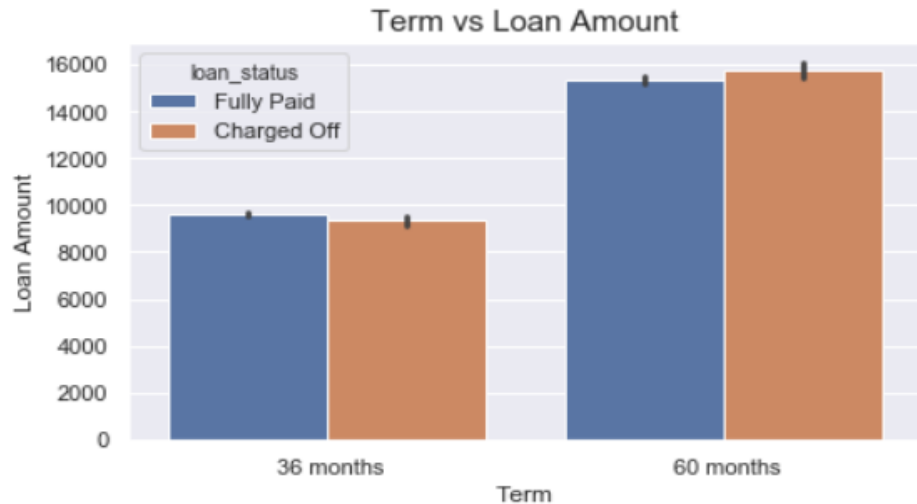
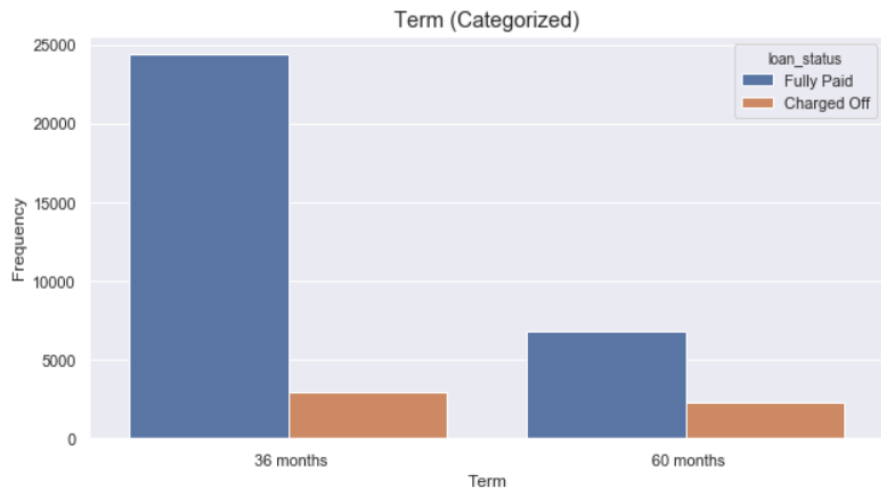
Lending Club: Analysis (Interest Rate)



Charged off loan rate is directly proportional to Interest rate. As the interest rate increases charged off loan rate increases.

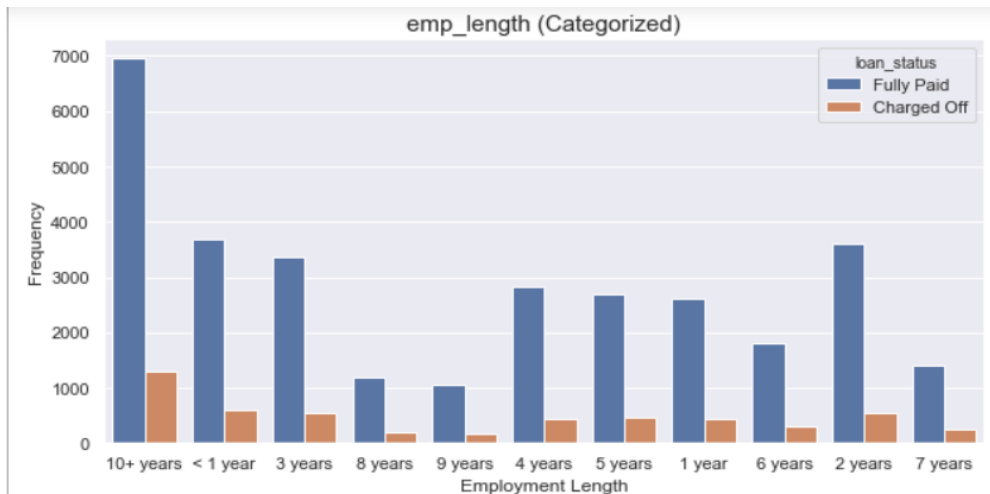
Interest Rate also increase with increase in loan amount and tenure.

Lending Club: Analysis (Term)



Percentage to charged off loans increases with term and also the average charged off loan amount is high for higher term

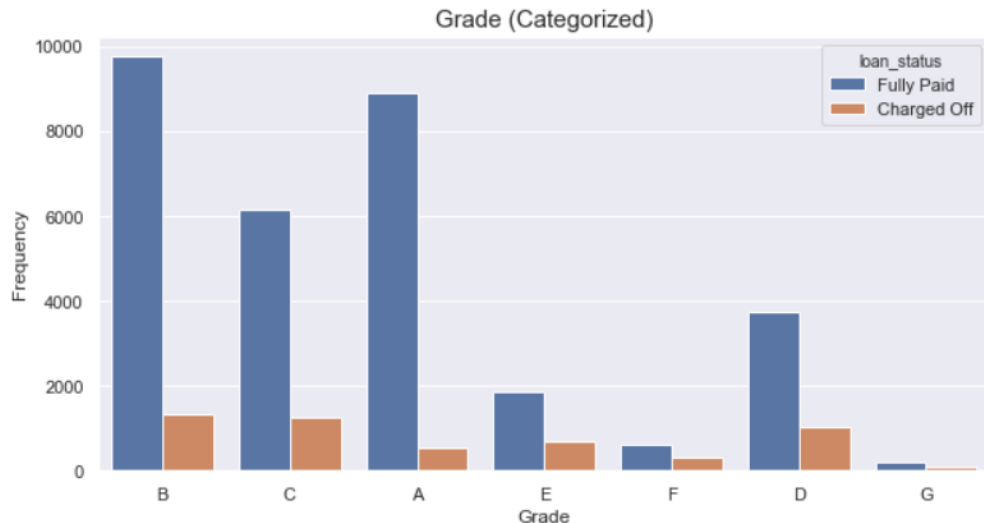
Lending Club: Analysis (Employment Length)



Charged Off Rate is slightly high for employment length 10+ years, there is also high chance of loan getting charged off for employee length 7 years. Overall there is not huge difference between employment length and charged off loan proportion

----- Percentage of Fully Paid & Charged Off Loan based on Employment Length -----

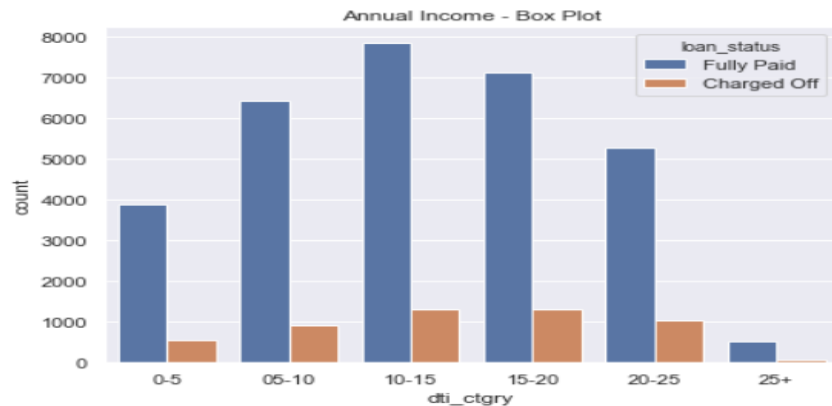
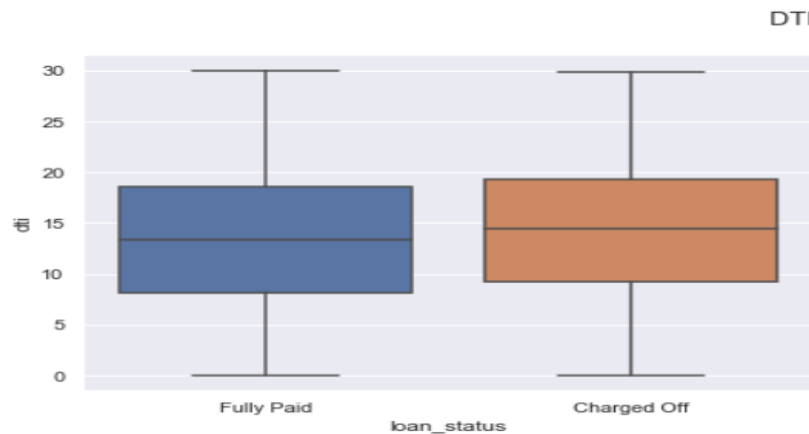
loan_status	emp_length	Charged Off	Fully Paid	Total	Chargedoff_Proportion
0	1 year	437	2609	3046	14.346684
1	10+ years	1288	6949	8237	15.636761
2	2 years	549	3608	4157	13.206639
3	3 years	545	3367	3912	13.931493
4	4 years	442	2821	3263	13.545817
5	5 years	451	2678	3129	14.413551
6	6 years	297	1818	2115	14.042553
7	7 years	257	1414	1671	15.380012
8	8 years	199	1193	1392	14.295977
9	9 years	155	1043	1198	12.938230
10	< 1 year	605	3696	4301	14.066496



Lower the grade higher the chances of loan getting charged off. Loan amount and Interest Rate increases with decrease in grade.

----- Percentage of Fully Paid & Charged Off Loan based on Home Ownership -----

loan_status	grade	Charged Off	Fully Paid	Total	Chargedoff_Proportion
0	A	551	8900	9451	5.830071
1	B	1318	9741	11059	11.917895
2	C	1246	6150	7396	16.846944
3	D	1043	3750	4793	21.760901
4	E	674	1848	2522	26.724822
5	F	297	619	916	32.423581
6	G	96	188	284	33.802817

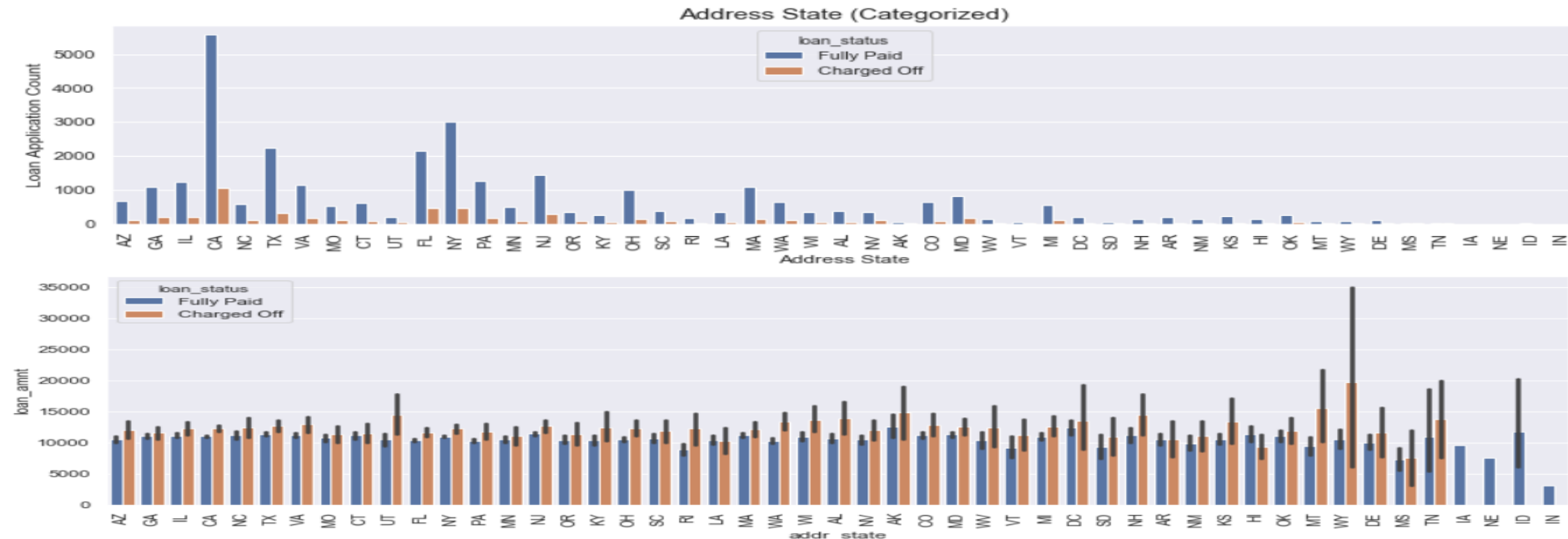


----- Percentage of Fully Paid & Charged Off Loan based on DTI -----

loan_status	dti_ctgry	Charged Off	Fully Paid	Total	Chargedoff_Proportion
0	0-5	541	3888	4429	12.214947
1	05-10	925	6433	7358	12.571351
2	10-15	1305	7848	9153	14.257620
3	15-20	1305	7118	8423	15.493292
4	20-25	1047	5273	6320	16.566456
5	25+	79	516	595	13.277311

As the debt to income ratio increases charged off rate increases

Lending Club: Analysis (Address State)



Number of charged off loan is high for Address States for CA, NY, FL, TX & NJ, this may be due to higher number of loan given in these states

States WY, MT, TN, AK has the the highest average loan amount that was charged off, this needs to be investigated as to why there are such high loan amounts getting charged off in these states

As the debt to income ratio increases charged off rate increases, hence looking into DTI before loan approval is good option

Lending club should be more alert in approving loan for applicant with lower income

Lending Club should approve loans for higher grade applicants

Lending club should look into public records before approving the loan

Lending club should pay special attention while approving loan for small business, House, Debt

Consolidation Other

Lending club should be cautious while approving loan for Rent and Others

Lending club should be cautious while approving loan for applicants demanding higher amount for longer tenure



Thank You!