Lending Club case Study

CONTRIBUTORS – KUMAR KS AND DILPREET KAUR

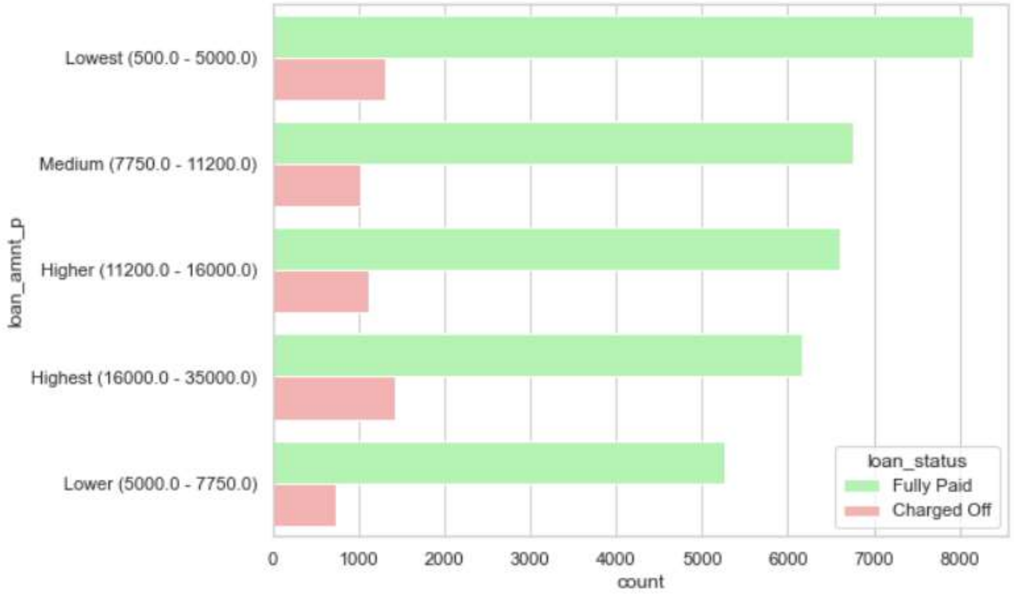
TABLE OF CONTENTS

PROBLEM STATEMENT

- A consumer finance company 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.
- Like most other lending companies, 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. In this case, the customers labelled as 'charged-off' are the 'defaulters'.
- If one is able to identify these risky loan applicants, then such loans can be reduced thereby cutting down the amount of credit loss. Identification of such applicants using EDA is the aim of this case study.
- In other words, 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.

ANALYSIS APPROACH

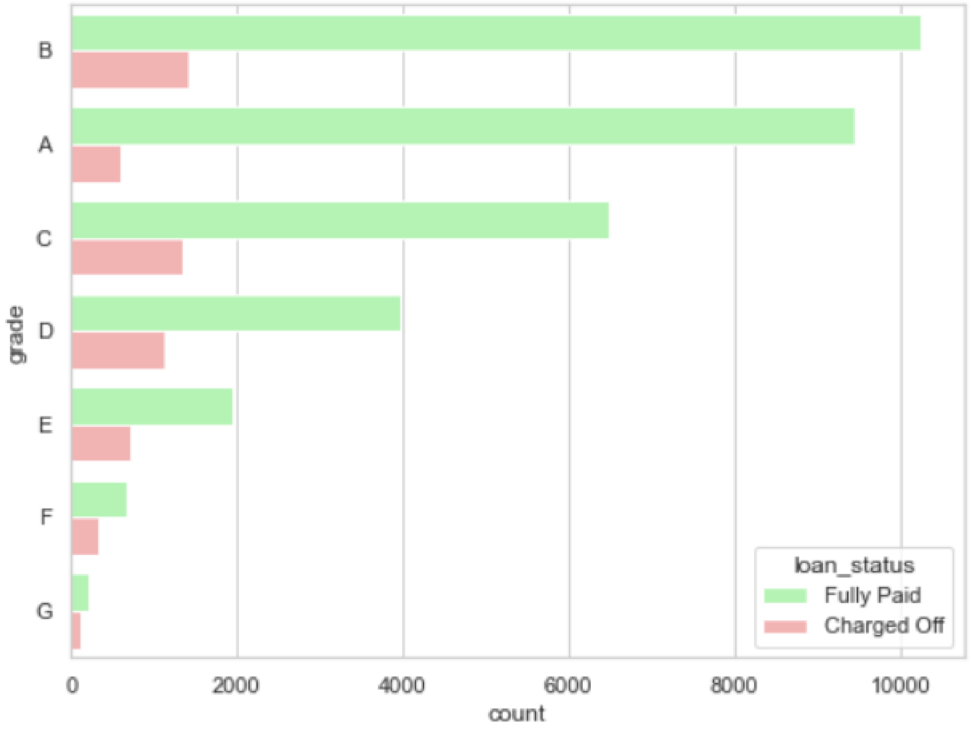
UNIVARIATE ANALYSIS



loan_amnt_p	Charged off %	Record count
Highest (16000.0 - 35000.0)	0.187624	7579
Higher (11200.0 - 16000.0)	0.145368	7739
Lowest (500.0 - 5000.0)	0.138725	9472
Medium (7750.0 - 11200.0)	0.131613	7788
Lower (5000.0 - 7750.0)	0.123521	5999

INFERENCE

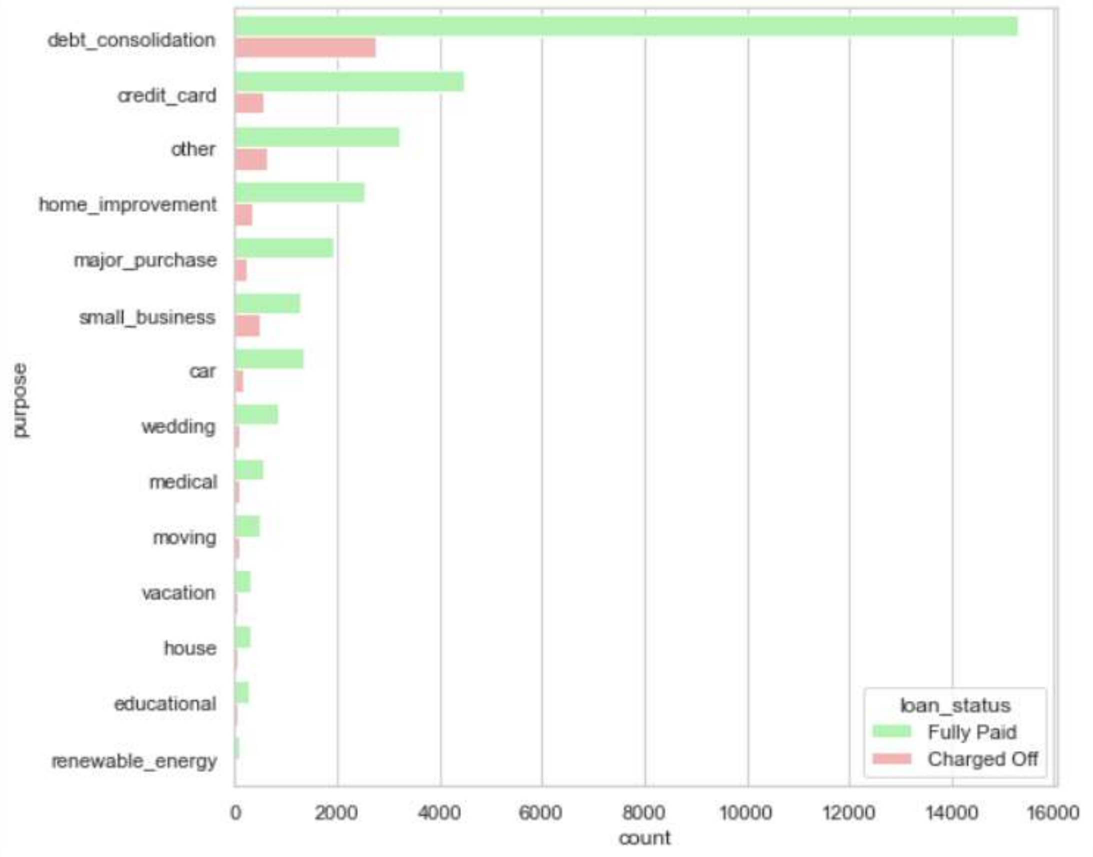
Higher the loan amount, greater the chance of loan getting default.



grade	Charged off %	Record count
G	0.337793	299
F	0.326844	976
E	0.268494	2663
D	0.219862	5085
C	0.171943	7834
B	0.122056	11675
A	0.059930	10045

INFERENCE

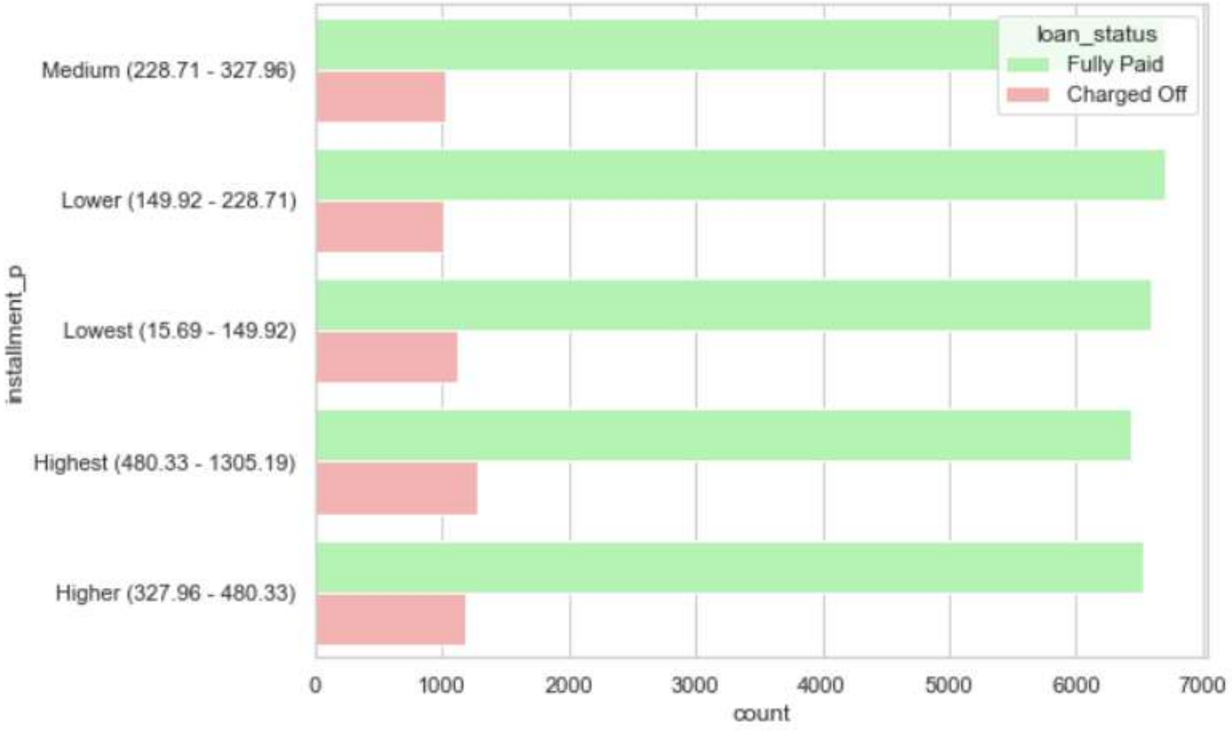
We can clearly see that loan grades having highest default percentages. G, F, E and D form grades where default rate is much higher than others.



purpose	Charged off %	Record count
small_business	0.270810	1754
renewable_energy	0.186275	102
educational	0.172308	325
other	0.163777	3865
house	0.160763	367

INFERENCE

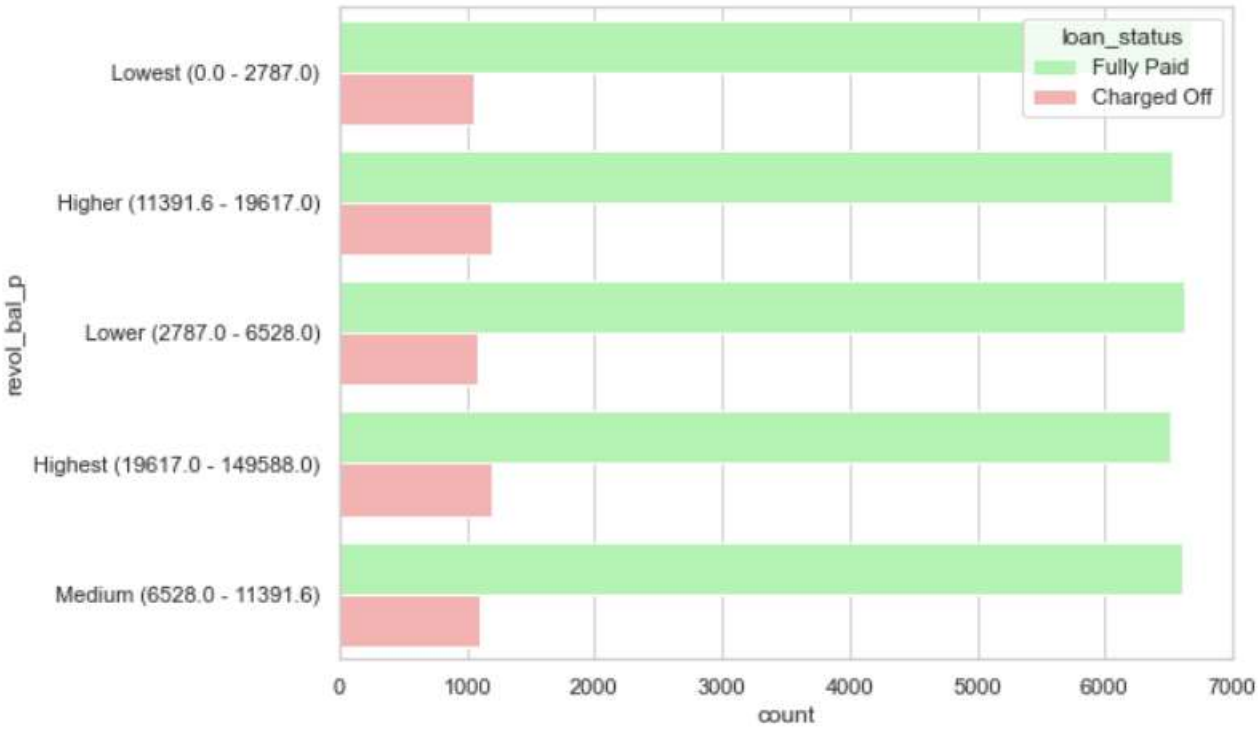
From the above analysis it is evidend that the loans taken for small_business, renewable_energy and educational are the riskier ones.



installment_p	Charged off %	Record count
Highest (480.33 - 1305.19)	0.166321	7714
Higher (327.96 - 480.33)	0.152988	7713
Lowest (15.69 - 149.92)	0.145153	7716
Medium (228.71 - 327.96)	0.132936	7718
Lower (149.92 - 228.71)	0.131934	7716

INFERENCE

This data and plot shows that higher installment amounts shows higher default percentages.

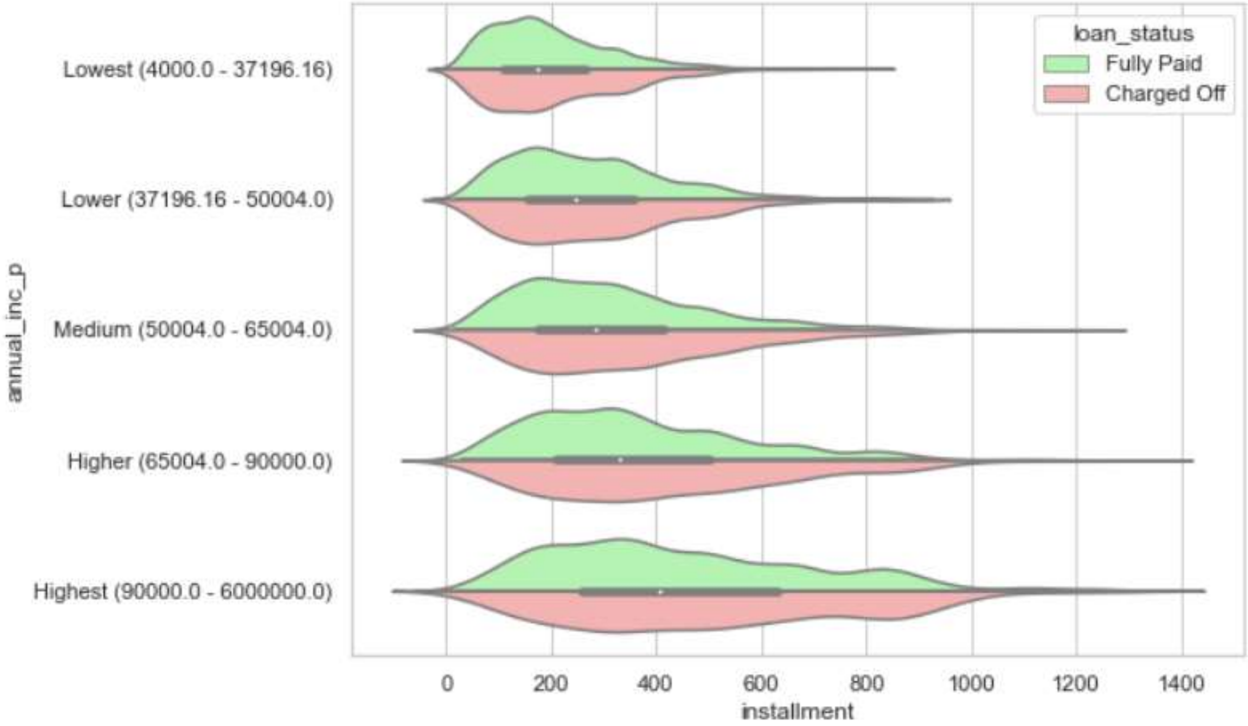


revol_bal_p	Charged off %	Record count
Highest (19617.0 - 149588.0)	0.154913	7714
Higher (11391.6 - 19617.0)	0.154335	7717
Medium (6528.0 - 11391.6)	0.142894	7712
Lower (2787.0 - 6528.0)	0.141283	7715
Lowest (0.0 - 2787.0)	0.135898	7719

INFERENCE

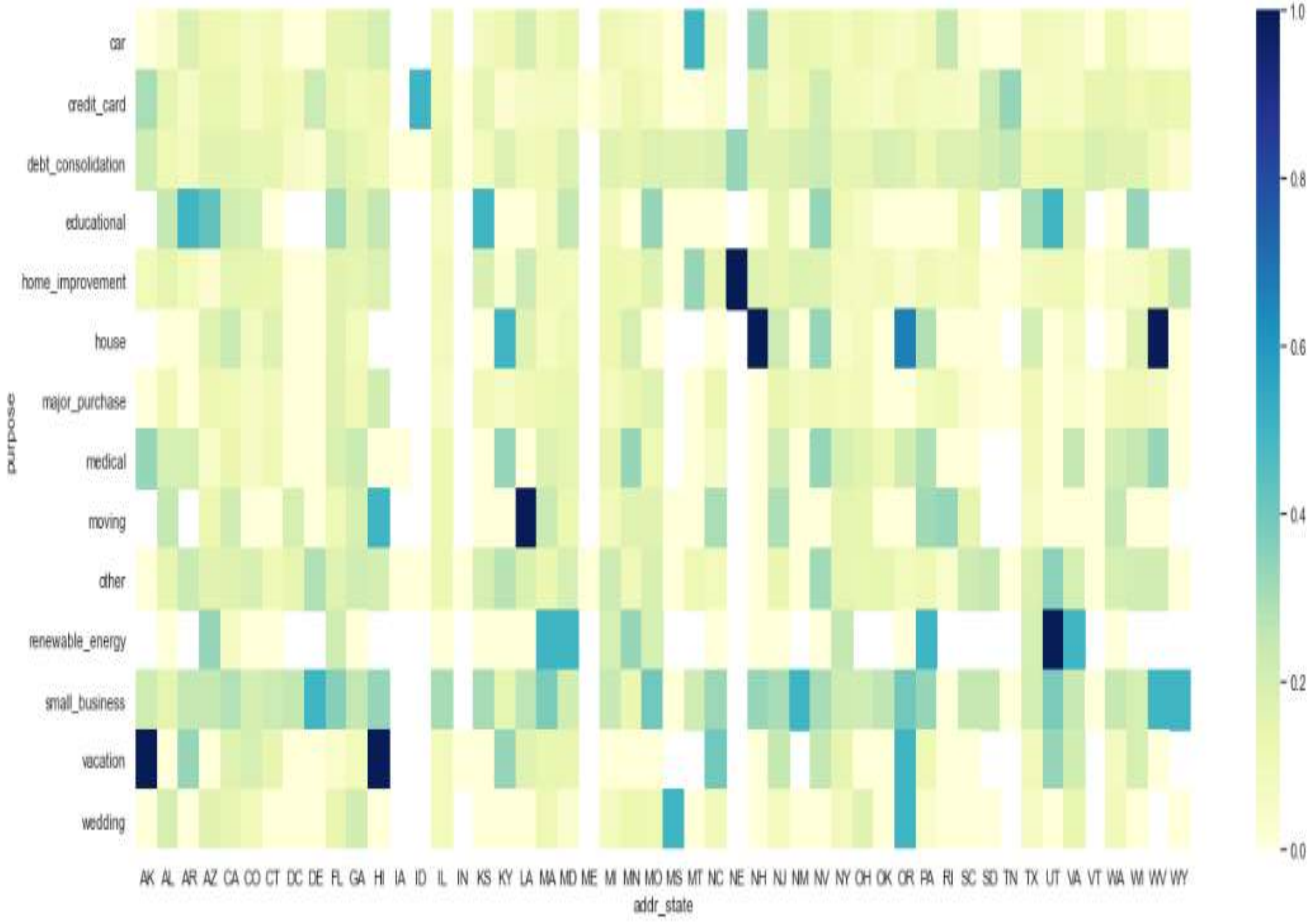
This shows the total credit revolving balances slightly influence the default percentage. Higher the revolving balance, bigger the chance of the loan getting defaulted.

BIVARIATE ANALYSIS



INFERENCE

This figure shows that for higher installments for any income group have more number of defaults.



INFERENCE

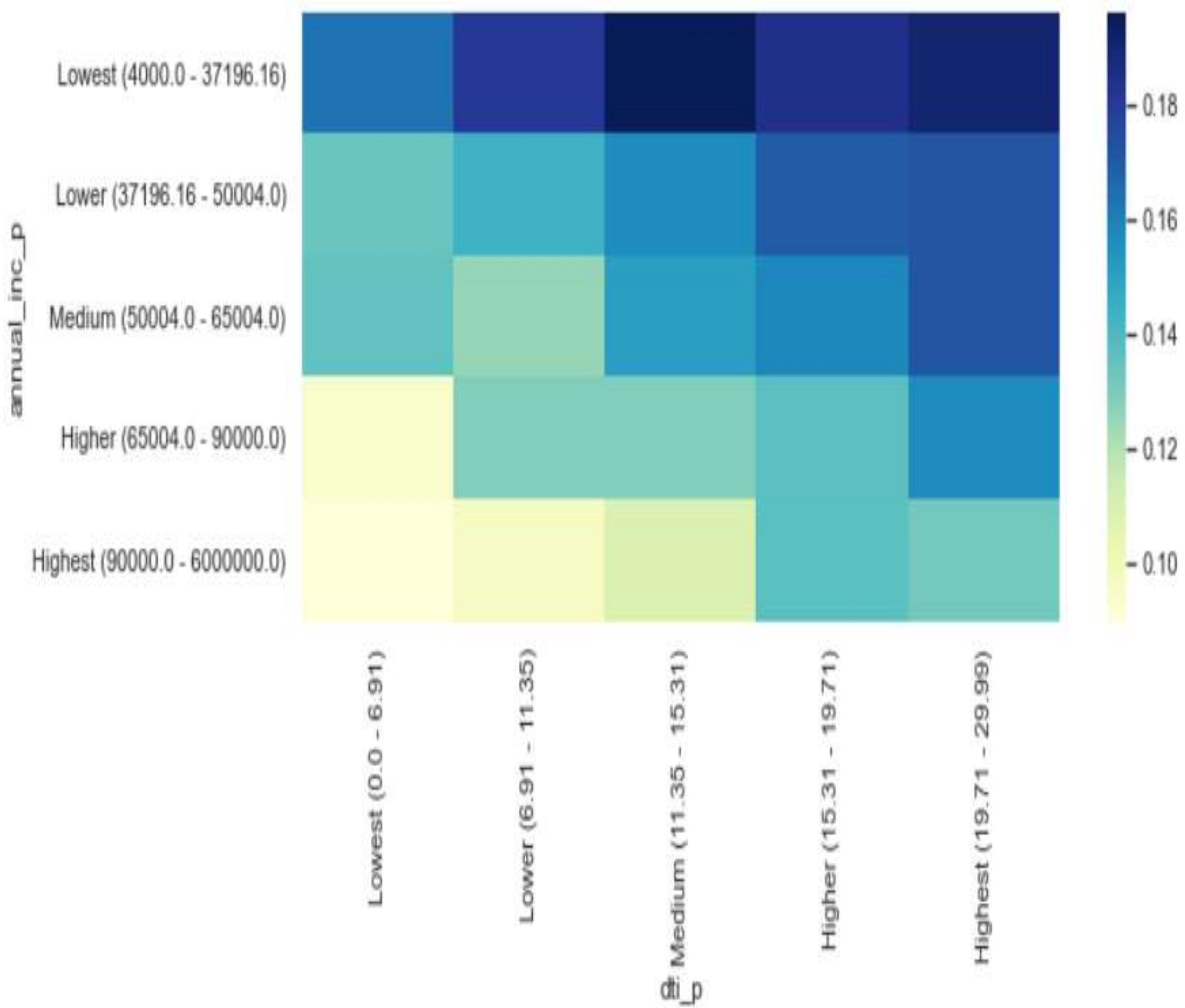
As per this plot, the darker the intersection of addr_state has with the purpose of the loan, the risker the loan application is. Some of the examples are below:

•vacation loans in AK, HI, OR

•education loans in AR, KS, UT

•small business loans in DE, NM, WV, wY

•wedding loans in MS, OR



INFERENCE

Medium debt-to-income group in the lowest income range is the most risky when it comes to loan repayment.

BUSINESS CONCLUSION

Minor Impact	• Higher loan amount (above 16K) • Higher installment amount (above 327) • Lower annual income (below 37K) • Higher debt to income ratio (above 15%) • Applicant's address state (NV, SD, AK, FL, etc.) • Loan issue month (Dec, May, Sep)
Heavy Impact	• Higher interest rate (above 13%) • Higher revolving line utilization rate (above 58%) • Repayment term (5 years) • Loan grade & sub-grade (D to G) • Missing employment record • Loan purpose (small business, renewable energy, educational)
Combined Impact	• High loan amount & interest rate for lower income group • High installment and longer repayment term • Home ownership (other) and loan purpose (car, moving or small business) • Residential state and loan purpose • Income group and loan purpose

Thank You…