Lending Club Case Study

Prepared By:

Chaitra Hegde

Neeraj Kumar

Overview

Lending Club is a marketplace for loans where borrowers apply for loan, investors may/may not provide the loan.

Objectives

- Identifying the driving factors which can indicate if a loan is likely to be a charge off (borrowers who don’t repay the loan amount)
- Providing recommendations to investors so that they can decide on whether to approve loan for applicant or not.

Variable Analysis

- **Driving Factors: Individual variables**
  - Interest rate
  - Purpose
  - Term
  - Grade
  - Annual Income
  - Address State
  - Home Ownership
  - Public Bankrupcies

Variable Analysis

- **Driving Factors: Combination of variables**

- Loan amount vs Home ownership
- Loan amount vs Purpose
- Annual Income vs Purpose
- Interest Rate vs Purpose
- Loan amount vs Grade

Conclusion

- **Observations from Data Analysis:**
  - 75% of the loans have been under $14000. Average interest charged on the loans is 11.9%. 50 percentile of dti is at 13 which means that loan amounts sanctioned had good coverage in terms of the income of the borrower.
  - Total number of Charged off records are 5627 (~ 15%) and Total number of Fully Paid records are 32950 (~ 85%)
  - Number of Loans approved increasing every year. Pecentage of charged off loan is around 15% for last three years.
- **Conclusions from Data Analysis:**
  - Issue data analysis tells us that largest percentage of defaults happend in loans issued in year 2007.

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Conclusion

- ## **Conclusions from Data Analysis:**
- Percentage of defaults in loans having 60 months term is almost double of 36 months term. Club should negotiate for smaller term repayments for its loan.
- Going by the purpose of the loan, default in small business loans is highest followed by loans taken for 'renewable energy'.
- Larger percentage of default customer's loan interest rate was between 15% to 24%
- Customers whose purpose of loan is small_business had large ticket loans as compared to other categories. other than loan purpose of type 'home'.
- Larger percentage of default is in loan category grade as 'G' and 'F'
- Grade 'F' loans are defaulting at the higher loan amounts ,charged off loans median = $18000, while fully paid loans have the median of approx $15000 median of charged off loans for remaining grades is either same or lower than the median of fully paid off loans.

Continued...

Conclusion

- **Conclusions from Data Analysis:**
- Going by the percentage of default customers, Nebraska has the highest rate of default (~ 60%).
- Approximate 40% of default customers have two public bankrupcies.
- Customers who have a mortgage loan are least likely to default.
- Largest percentage of loan defaults are from customers whose home_ownership category is Other.

- Customers who have taken more loans with high interest rate for debt consolidation have high default rate.

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Recommendations

- Customers from Nebraska be reimbursed only for high grade customers.
- Customers having two or more than two public bankrupcies may be denied loans.
- Customers who have a mortgage loan but not taking loans for debt consolidation may be awarded preferences.
- Customers whose home_ownership category is Other and are taking loan for debt consolidation are most liekly to default and be avoided.
- Customers asking for 36 months term loan be preferred over 60 months term loans.
- Customers whose purpose of loan is small_business should be verified for source of income and preferred if they have a mortgage for a 36 months term loan.
- LC assigned grade as 'G' and 'F' may be approved for smaller ticket size loans and charged higher interest rate as risk of default is high.

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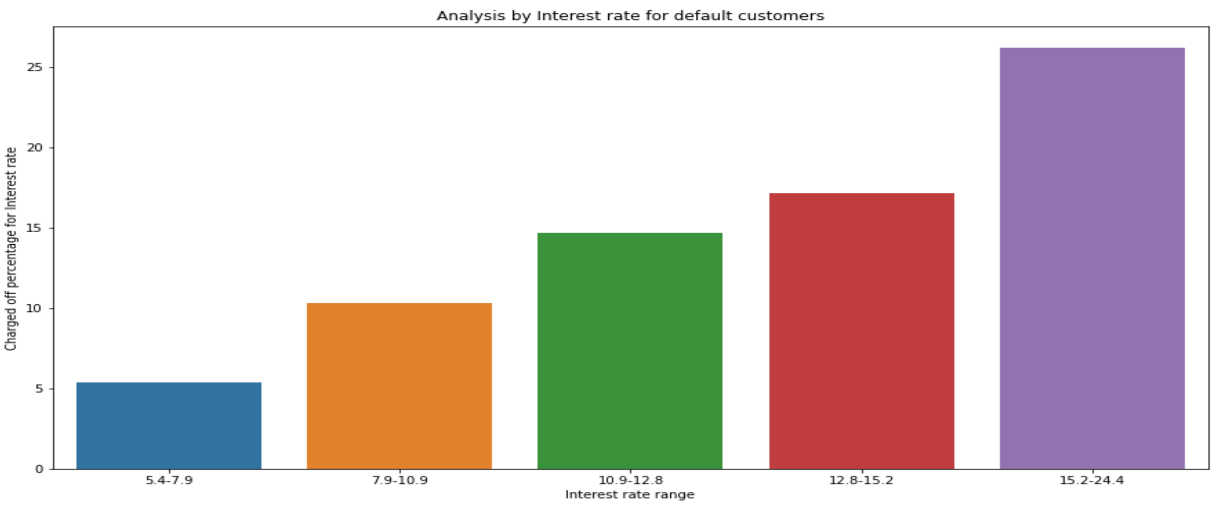
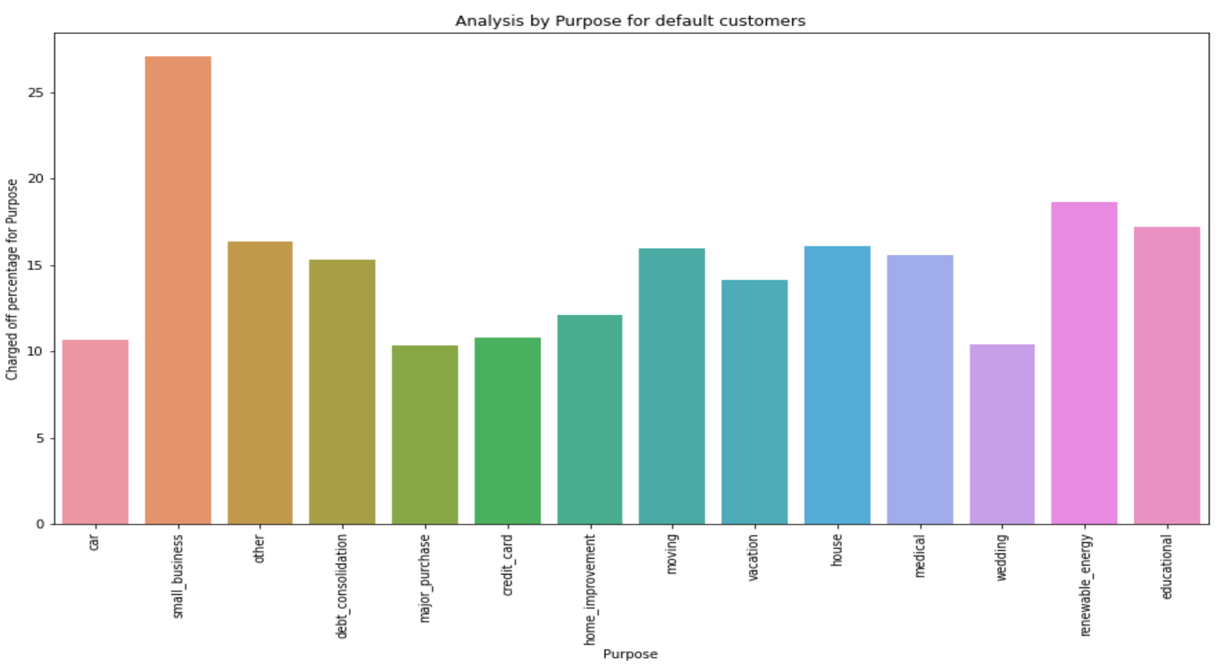
Exploratory Data Analysis Plots:

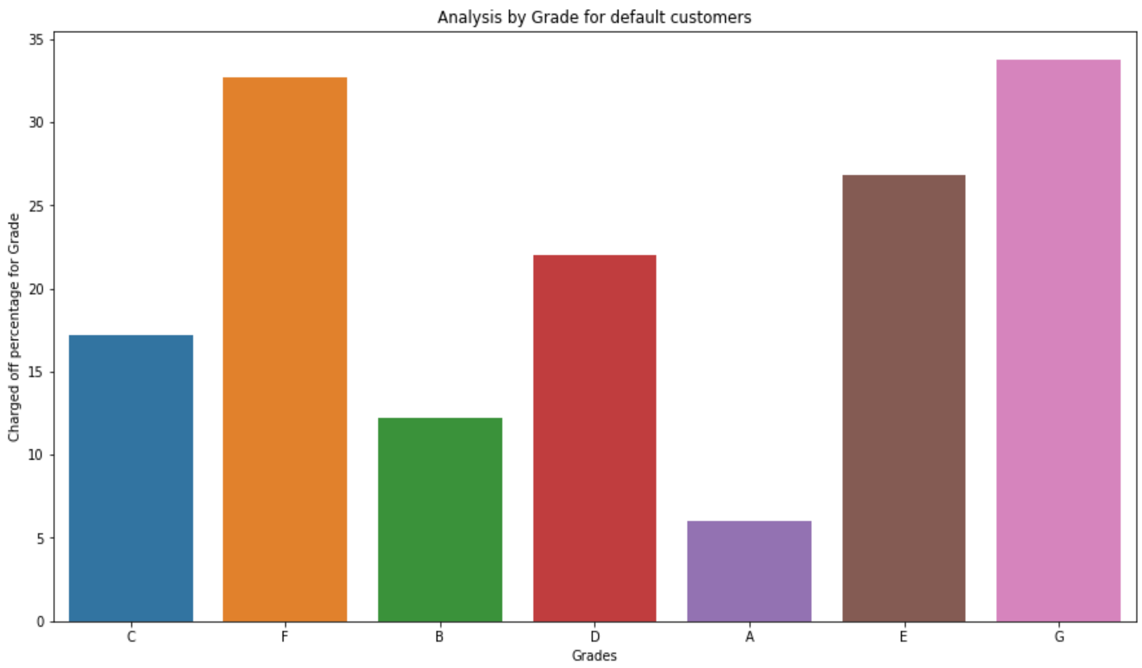
From here on you can enjoy various plots done to reach the conclusions and recommendations.



1.Interest Rate: Charged off percentage is more for higher interest rate.

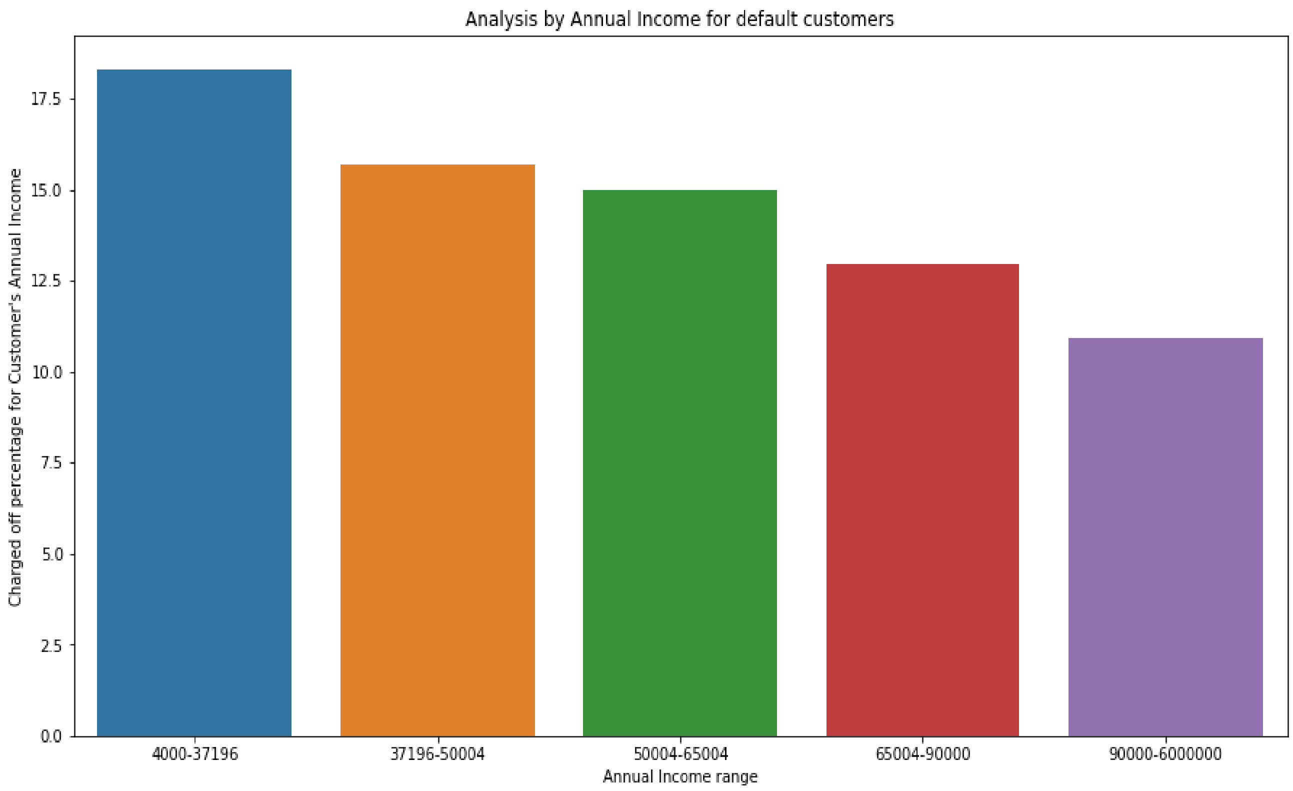
2. Purpose: Default percentage is more for "Small Business" and "Renewable Energy" purpose.
Purpose of the loan should be a driving factor for new applicants

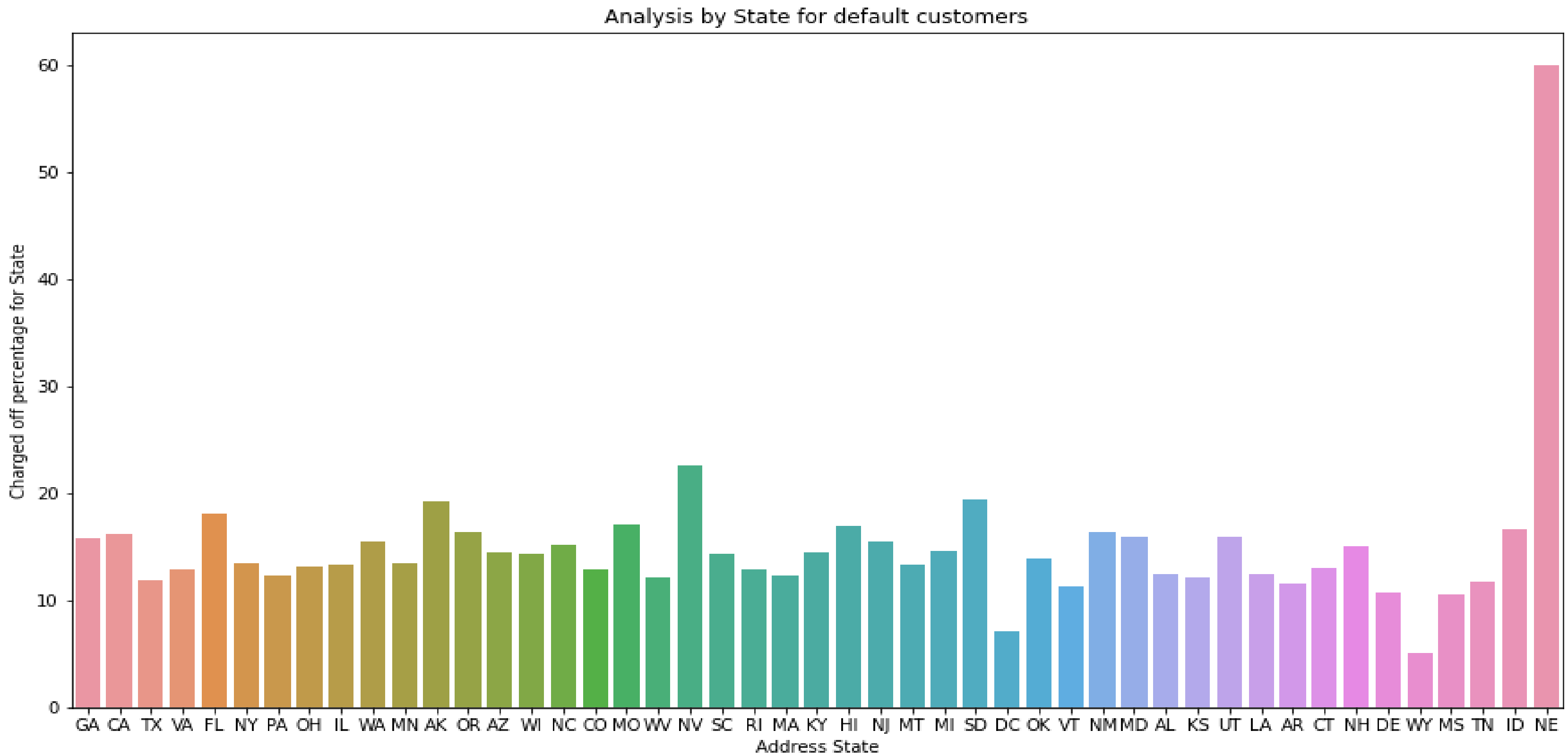




3. Grade: Default percentage is more for Grade G and F. For new applicants, Grade should be one of the driving factor

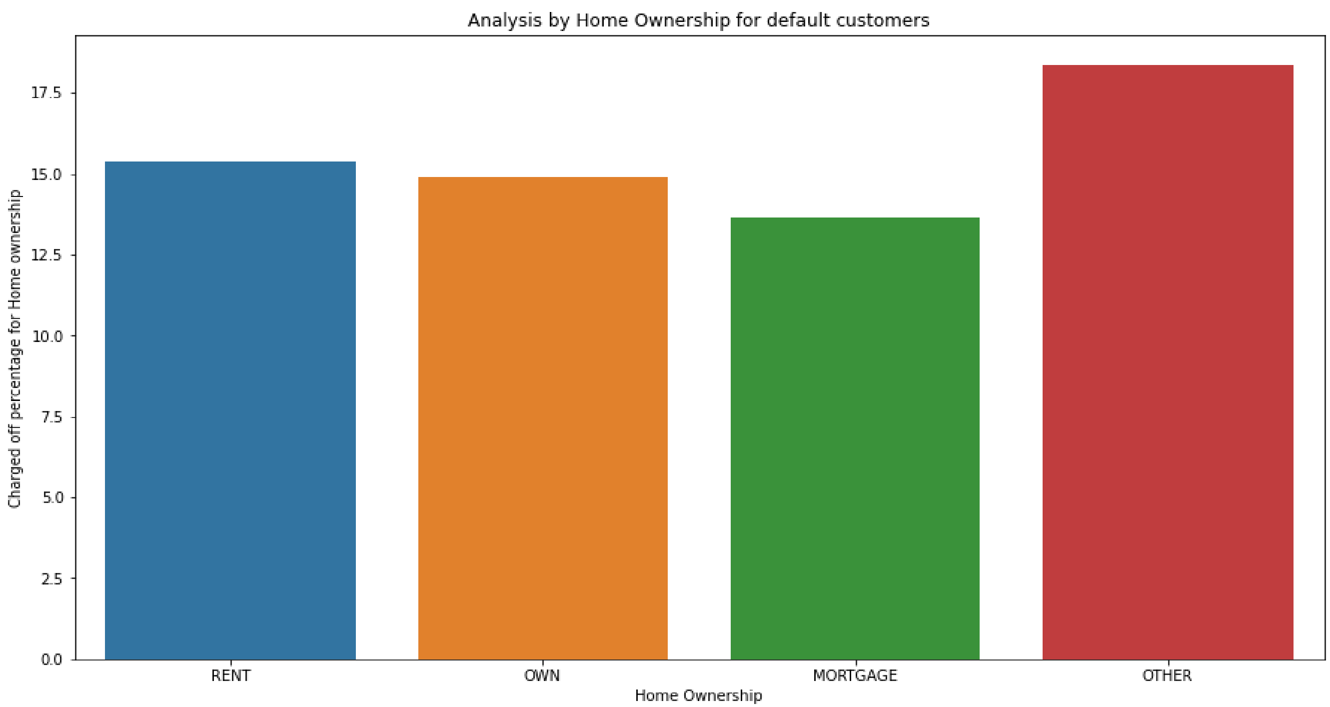
4. Annual Income: Charged off percentage is more for customers with lower income





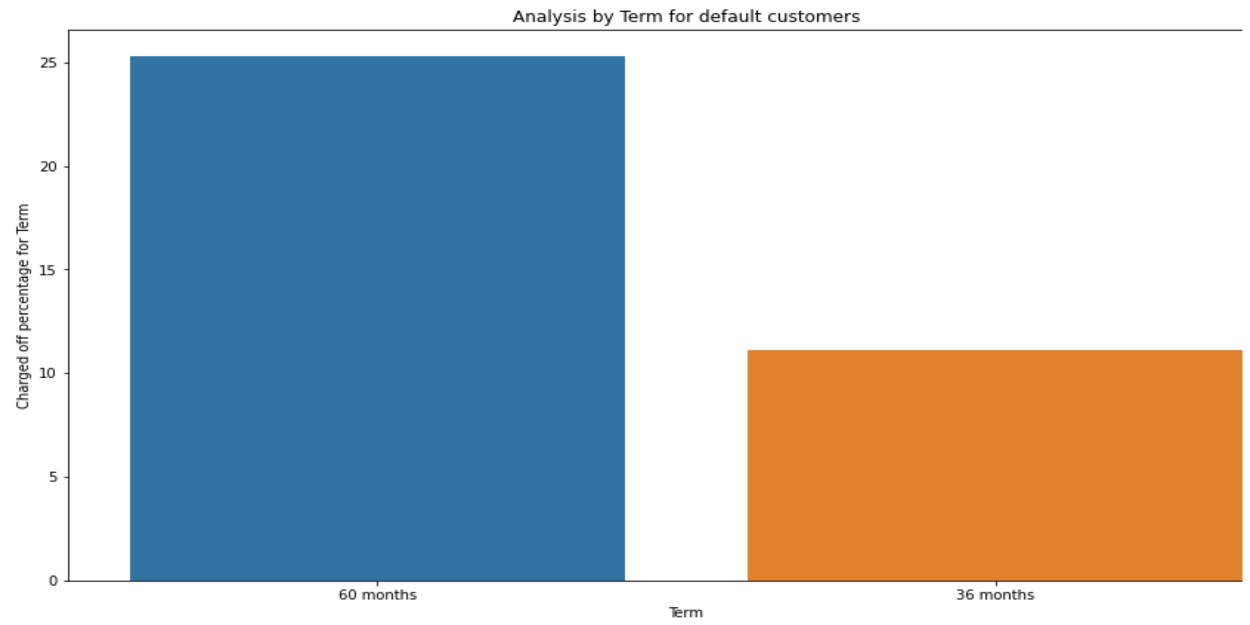
5. Address State: When the applicant is from the state **NE** or **NV**, he/she most likely to default

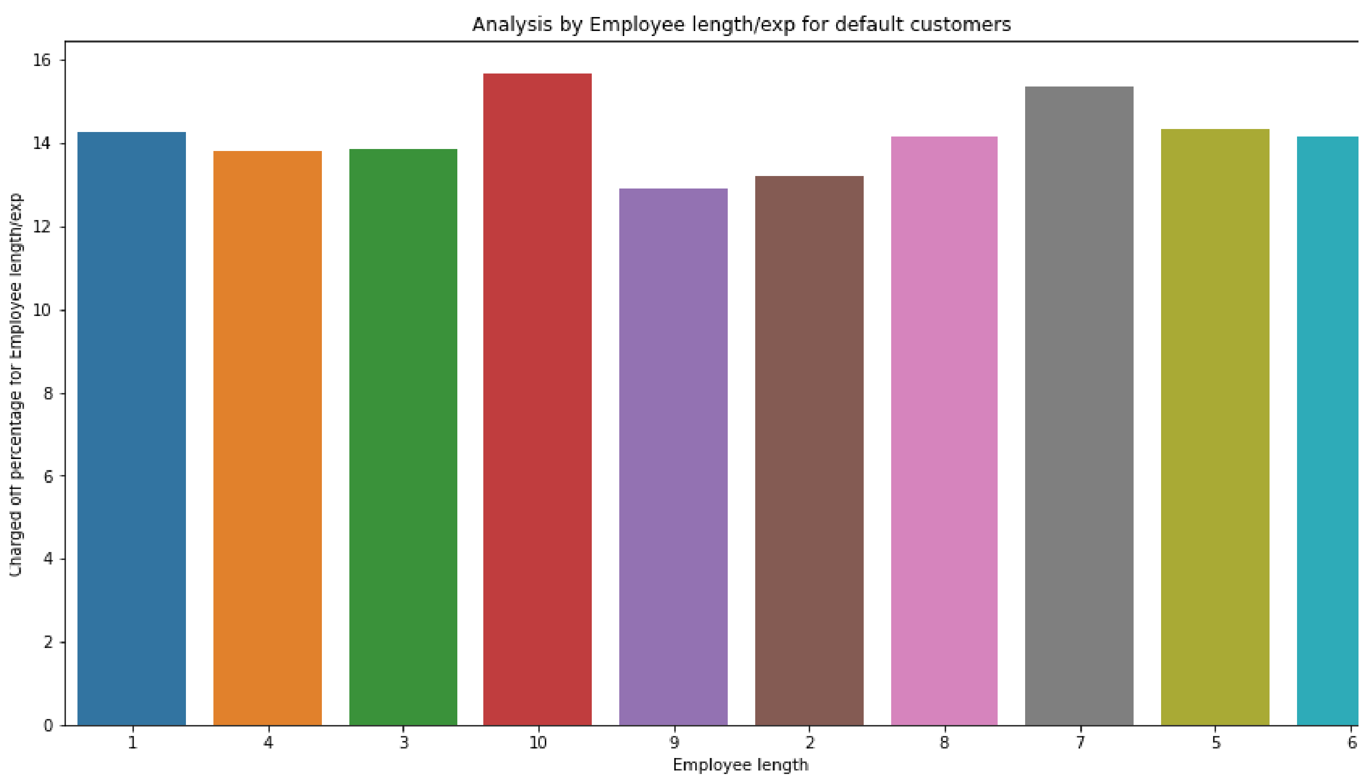
6. Home Ownership: Default percentage is more for the category "**Other**".
When the new applicant's home ownership is "Other",
it should be taken into notice before approving the loan



7. Term: When compared to 36 months tenure, customers with 60 months tenure defaulted more.

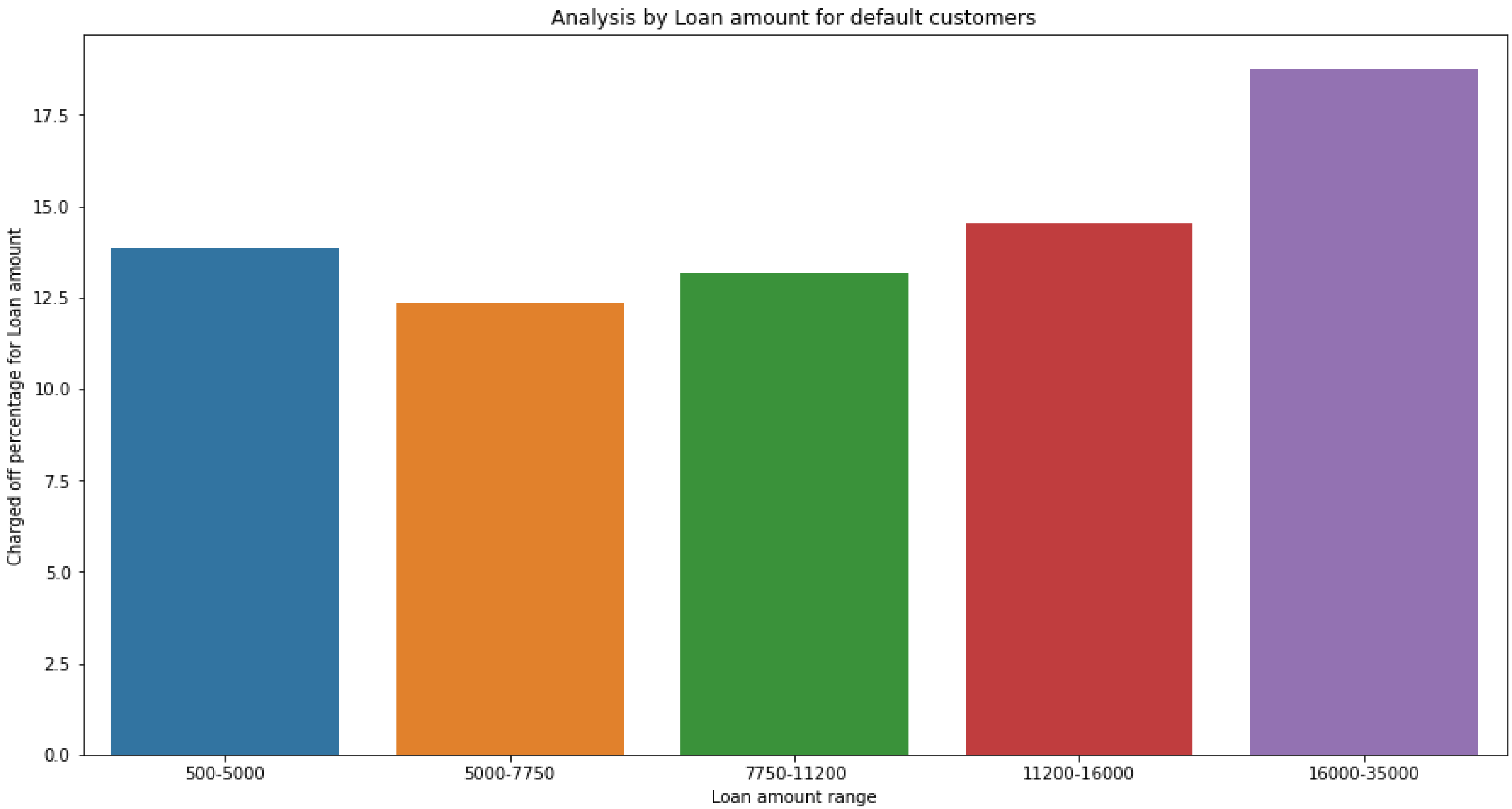
So, tenure should be taken into notice for new applicants





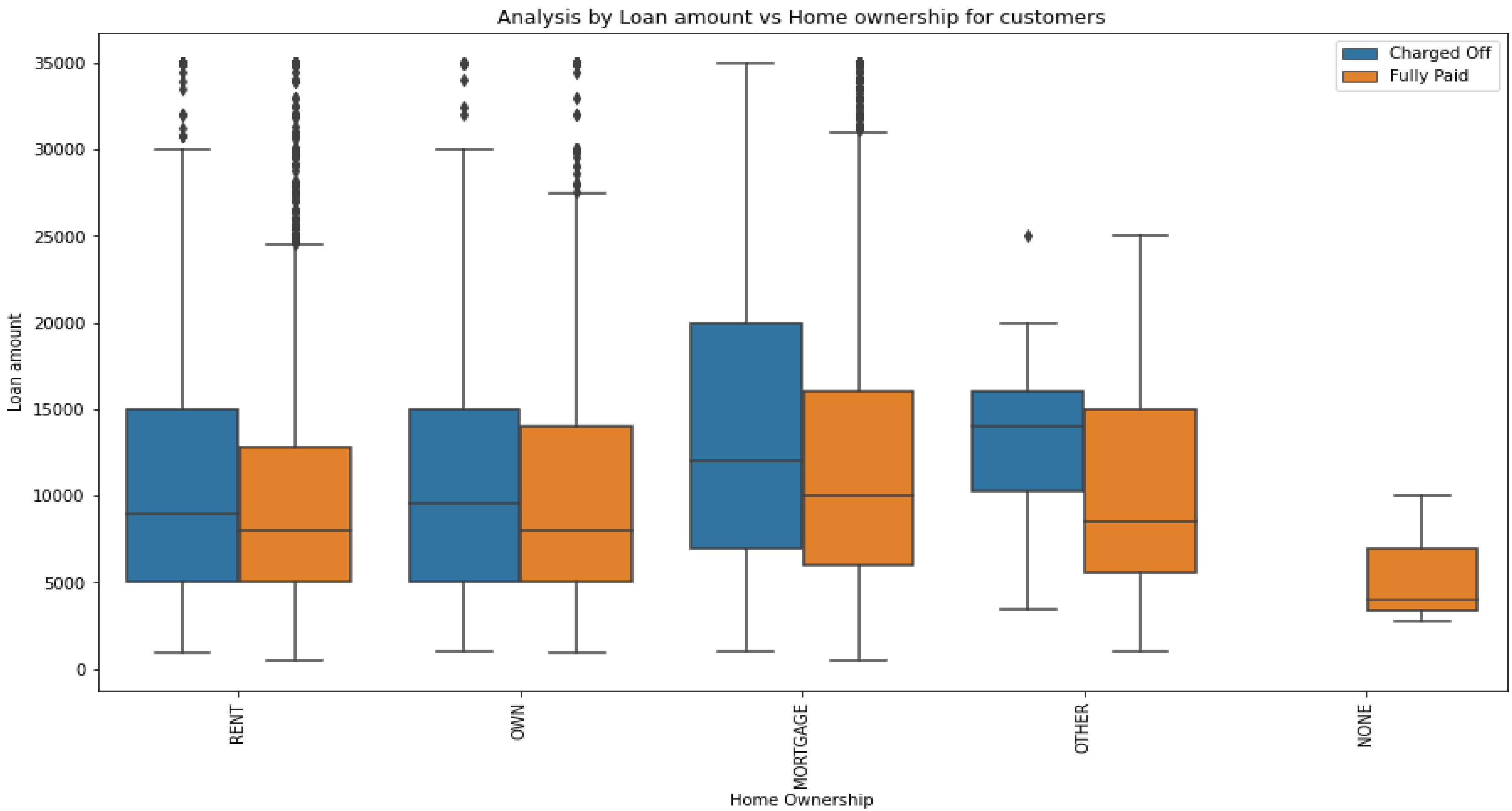
8. emp_length: Customers with 7 and 10 year experience defaulted mostly.

9. Loan Amount: Default percentage is more for larger loan amount i.e. 16k to 35k



Loan amount vs Home ownership:

In the loan defaulted customers, customers whose home_ownership is OTHER have median of defaulted loans around 11000.



Loan amount vs Purpose:

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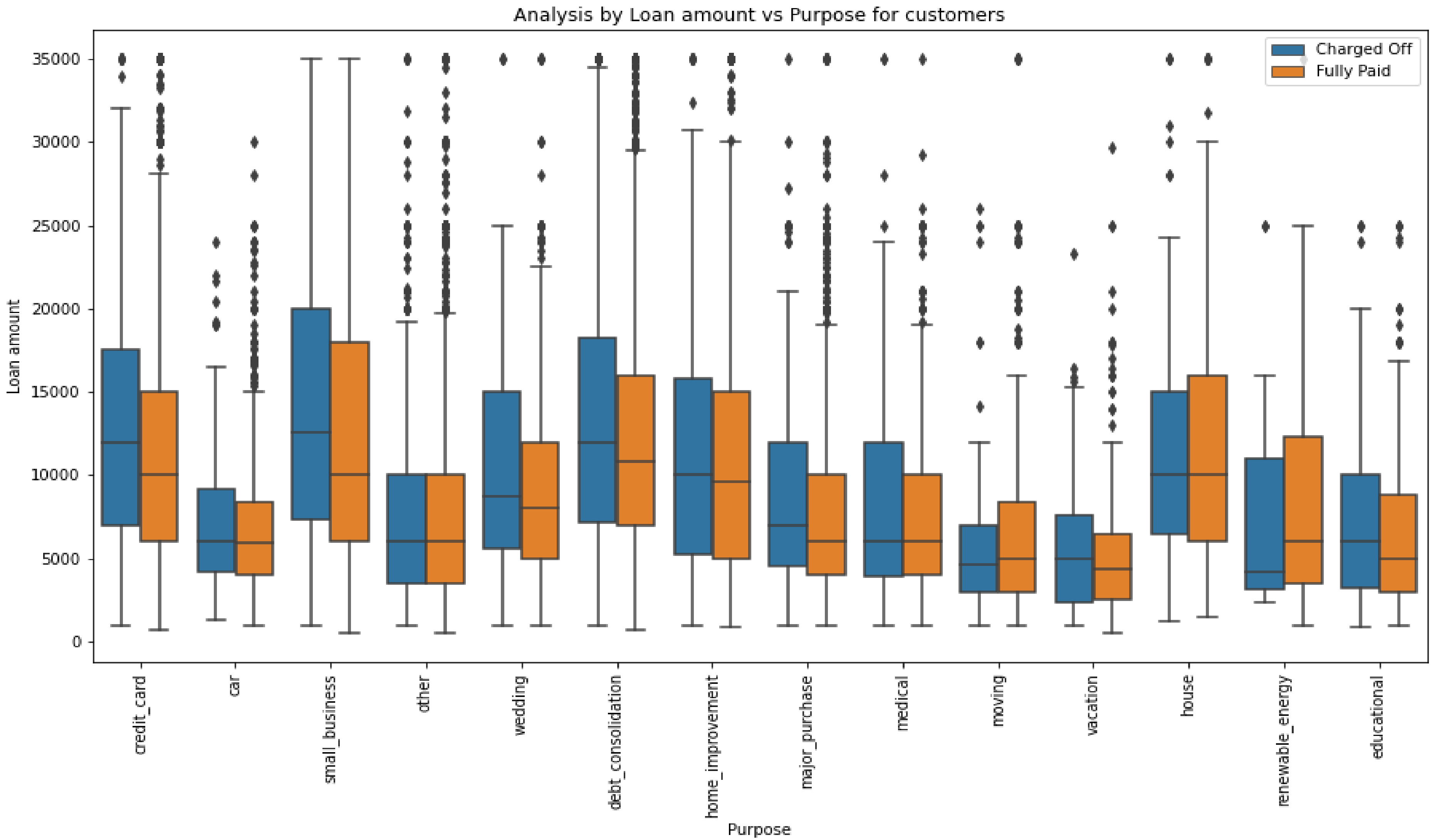
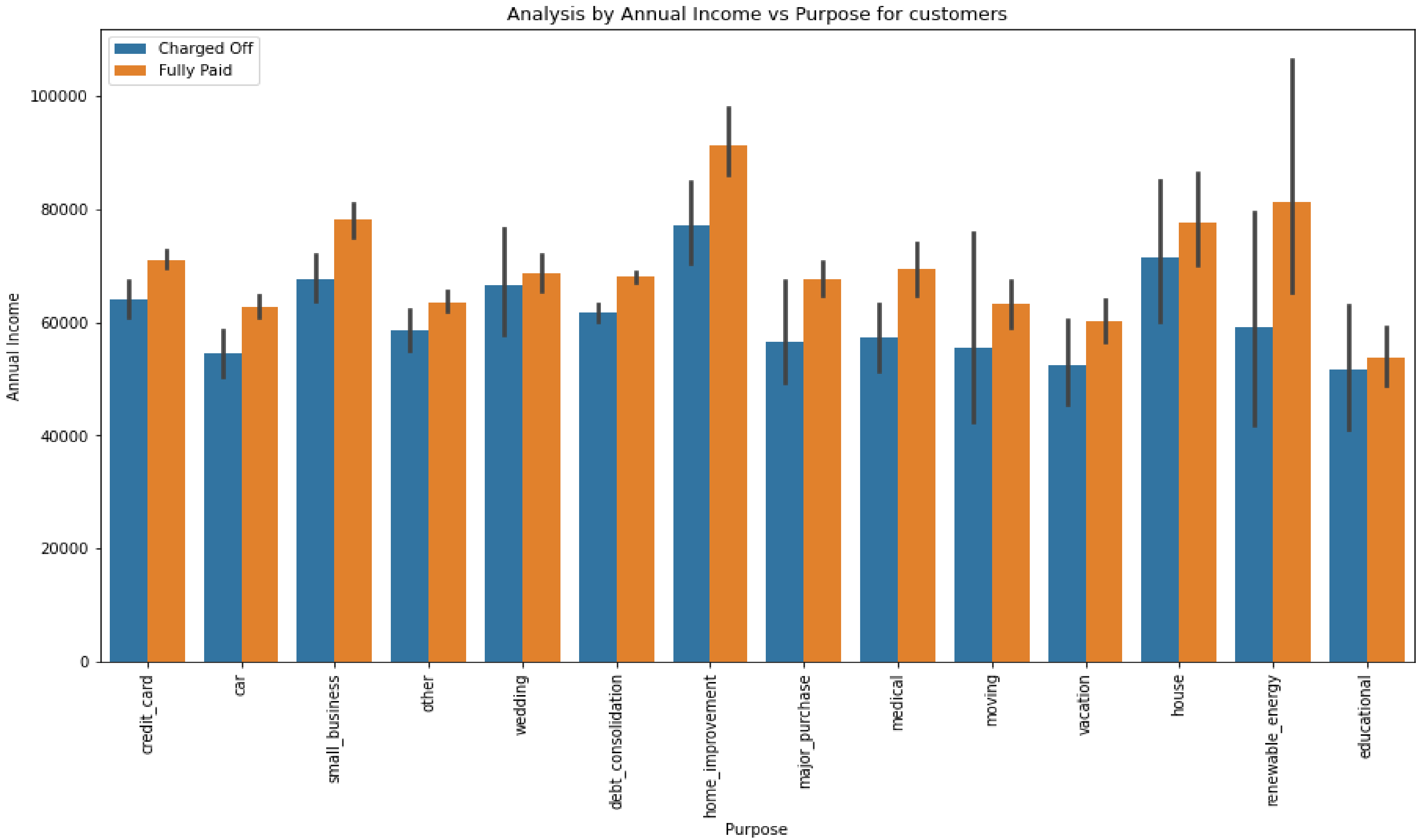


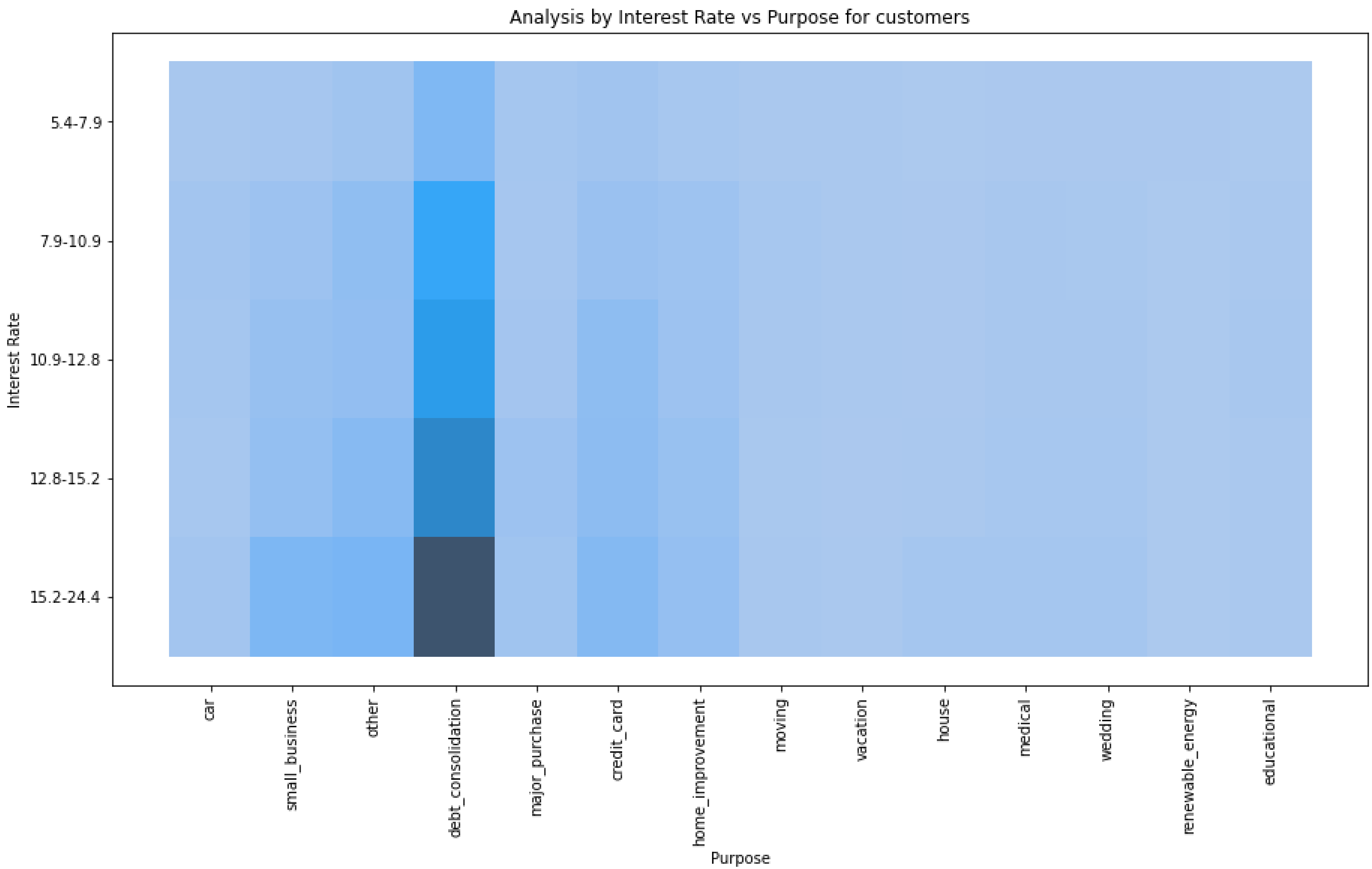
Annual Income vs Purpose:

In default customers, Customers with more annual income took loan for home_improvement. But wrt to loan default, there is no pattern.



Interest rate vs Purpose:

Customers who have taken more loans with high interest rate for debt consolidation have high default rate.



loan amount vs Grade

Grade F loans are defaulting at the higher loan amounts ,charged off loans median = $18000, while fully paid loans have the median of approx $15000.
Median of charged off loans for remaining grades is either same or lower than the median of fully paid off loans.