

LENDING CLUB EDA

Hema Iyer (Group Facilitator)
Tritam Mohanty (Group Member)
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Business Case

Overview of Lending Club

- * Lending Club is a Financial/Banking domain organization
- * The largest online loan marketplace in US
- * Facilitates loans - Personal loans, Business loans, Medical loans.
- * Provides easy access to loans online
- * Low interest rates

Expectations

- * Identify the driving factors for loan defaults
- * Identify factors contributing to defaults
- * Driving factors to be used in loan default and risk assessment
- * Get Key insights to help Lending club in proper risk assessment
- * Document the conclusions/recommendations to Lending club

Approach and steps

Data Understanding

- 39717 records and 111 columns
- Understanding of the fields and identify attributes that impact
- 50% columns with no data
- Columns with 60% + Null values



Data Cleanup

- Columns that do not impact EDA
- Fixing data types
- Fixing Invalid Values
- Standardize Precision
- Outlier Treatment



Univariate Analysis

- Analyze using individual columns



Segmented Univariate Analysis

- Analyze factors impacting Charged-Off loans



Bivariate Analysis

- Analyze using 2 columns

Key Findings For Business

Fully Paid Loans

- 87% loans fully paid
- 13% loans charged off
- 50% of borrowers Not Verified

Charged Off Loans

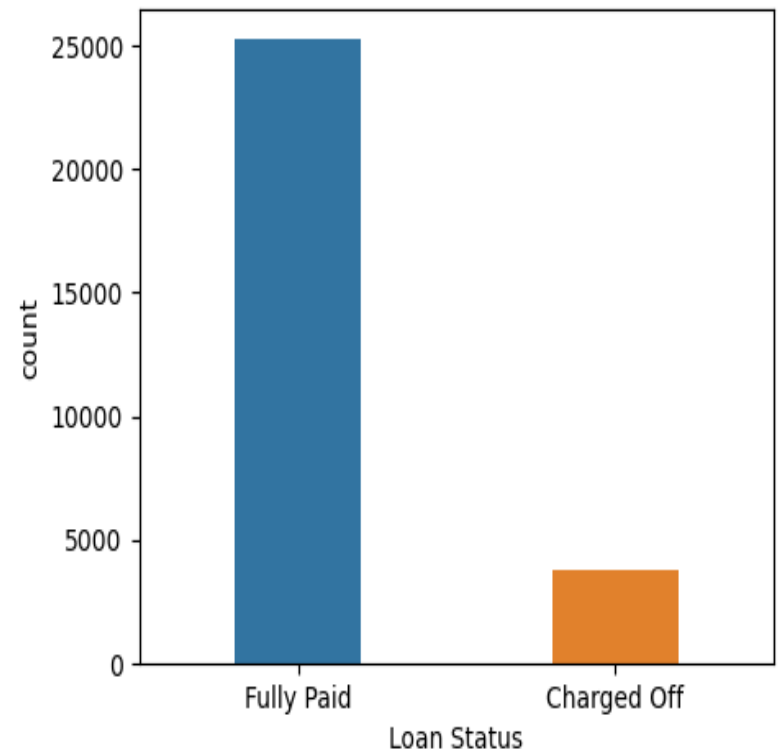
- 57.49% charged off loans were recovered
- 42.41% loans charged off
- 13.6% average charge off from 2007-2011

Profit and 100% Funding rate

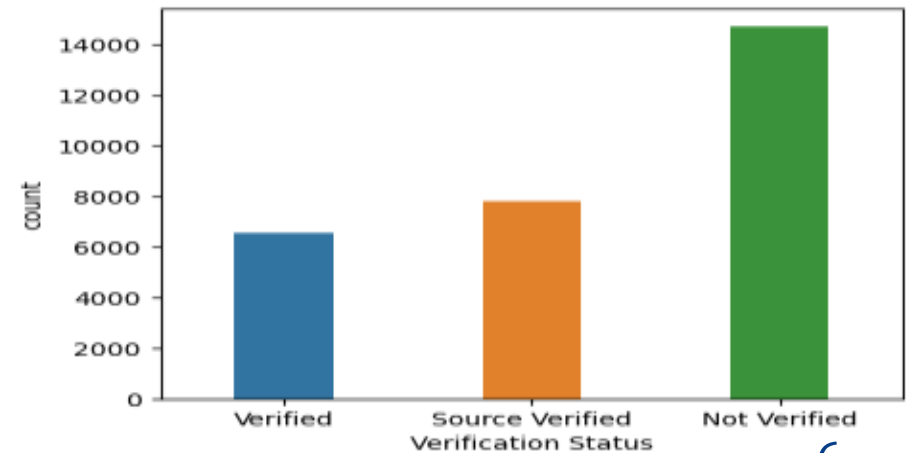
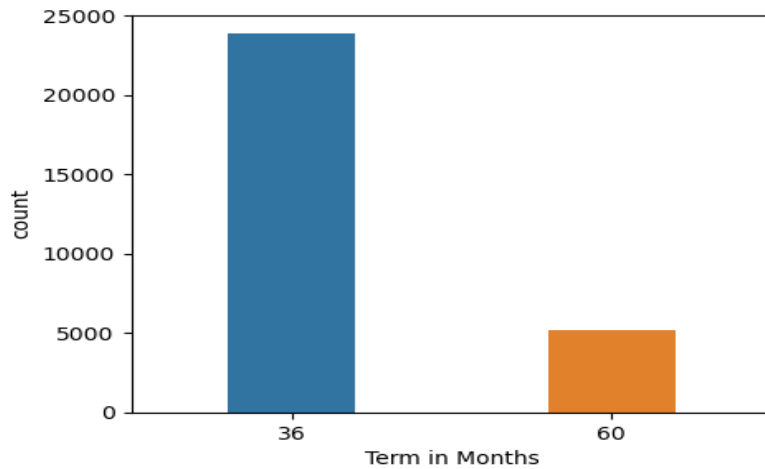
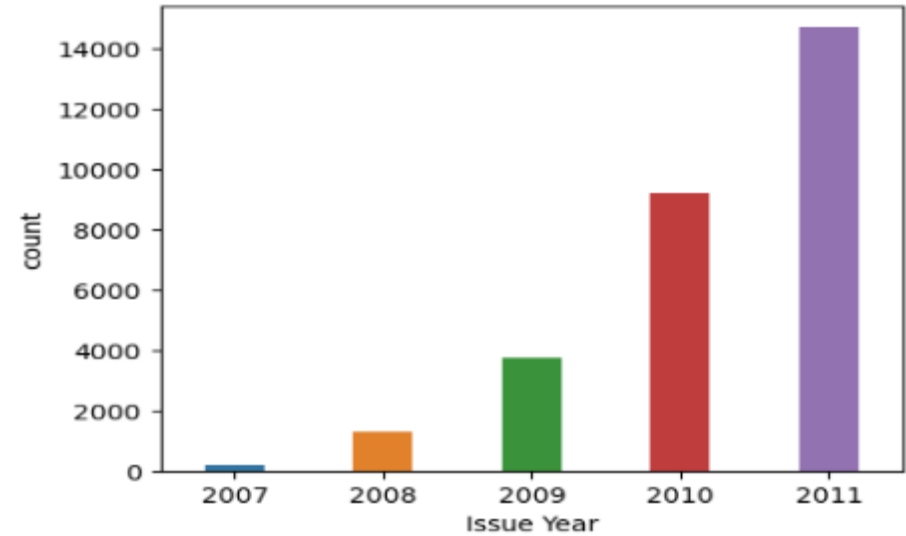
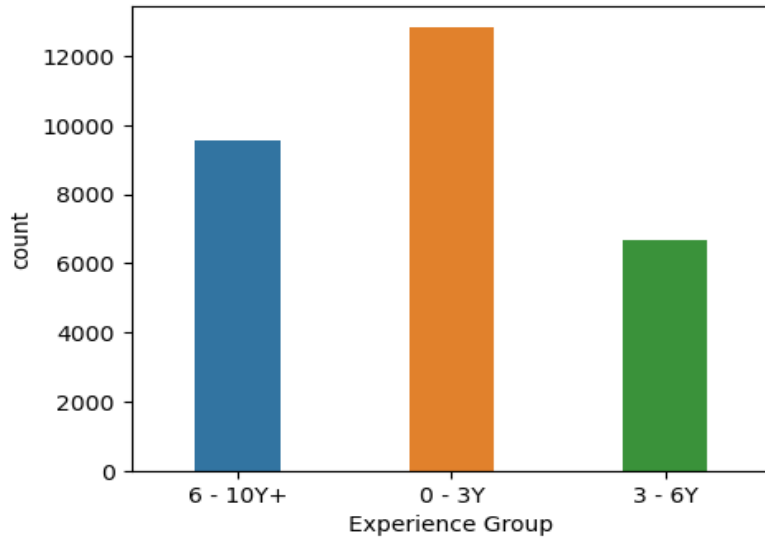
- 17.31% profit from fully paid loans
- 96.14% match of funded amount to loan amount
- 3.85% when loan amount did not match funded amount

Univariate Analysis

- * 87% Full paid and 13% Charged off loans
- * 36.1% (Maximum) borrowers in interest rate < 10%
- * Maximum borrowers in 0-50K income group (49.05%) income group and 0-3Y(44.13%) employment length
- * 82.1% borrowers fall in 36 months term and 17.8% in 60 months term
- * 50% borrowers are not verified
- * Grades A and B have minimum defaults
- * Loans issued show huge growth year on year
- * More loans taken towards Year End may be due to Festive season



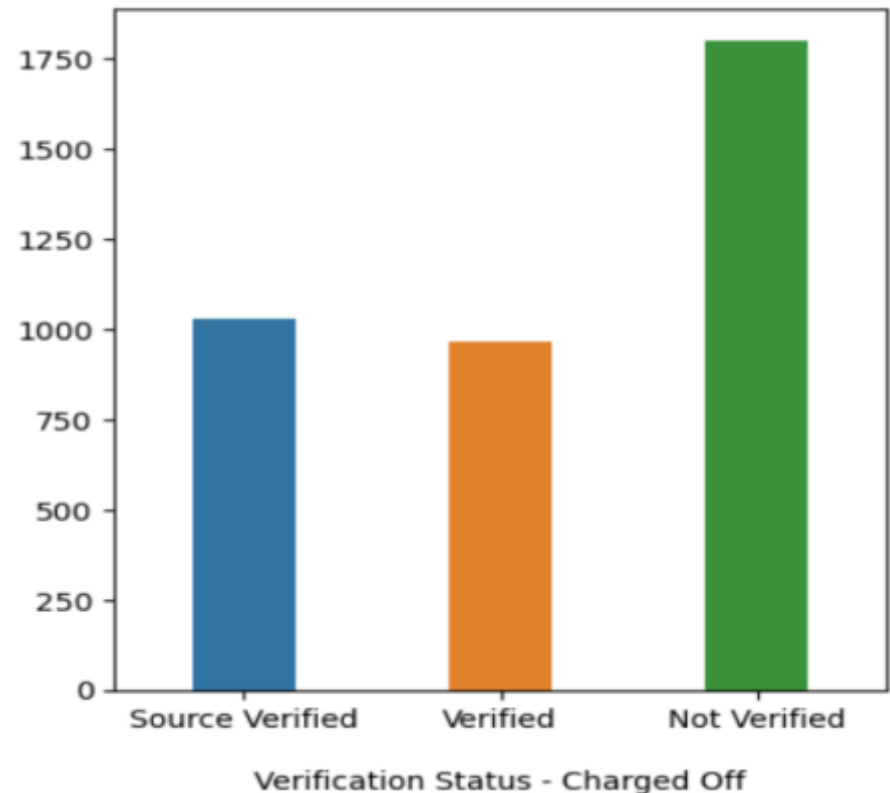
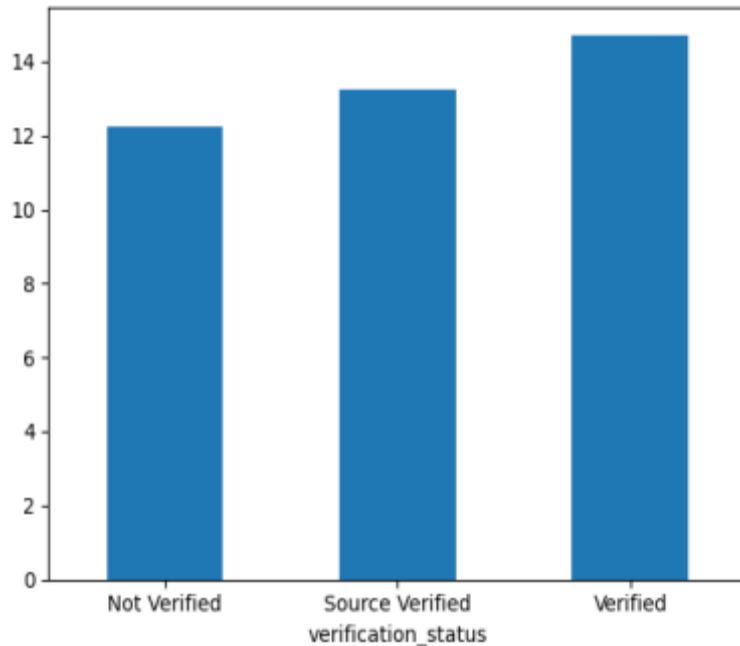
Univariate Analysis



Bivariate Analysis

Verification status / Loan Status

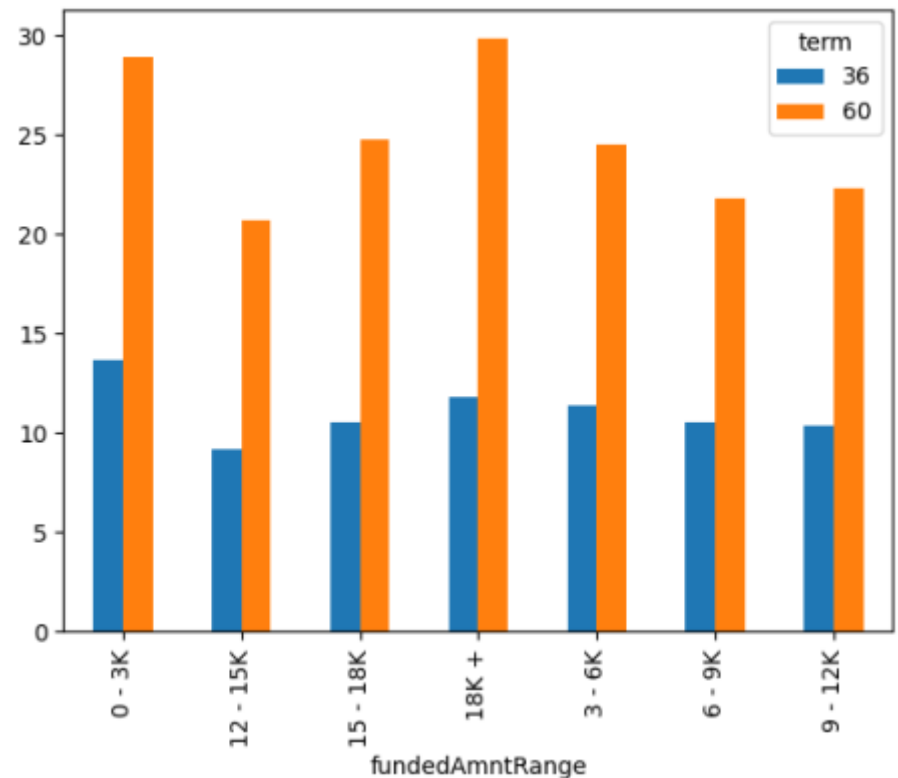
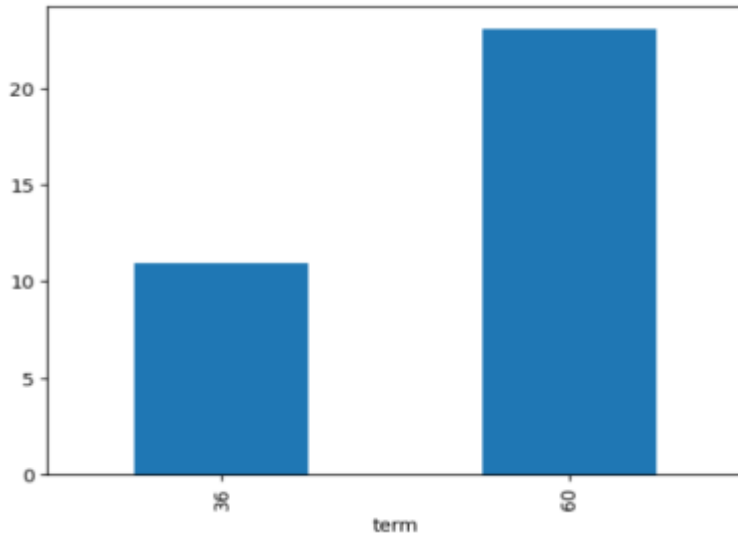
- * More number of charged off loans from Not Verified Applicants
- * Verified Applicants default 2.7% more when compared against total loans in Verified category



Bivariate Analysis

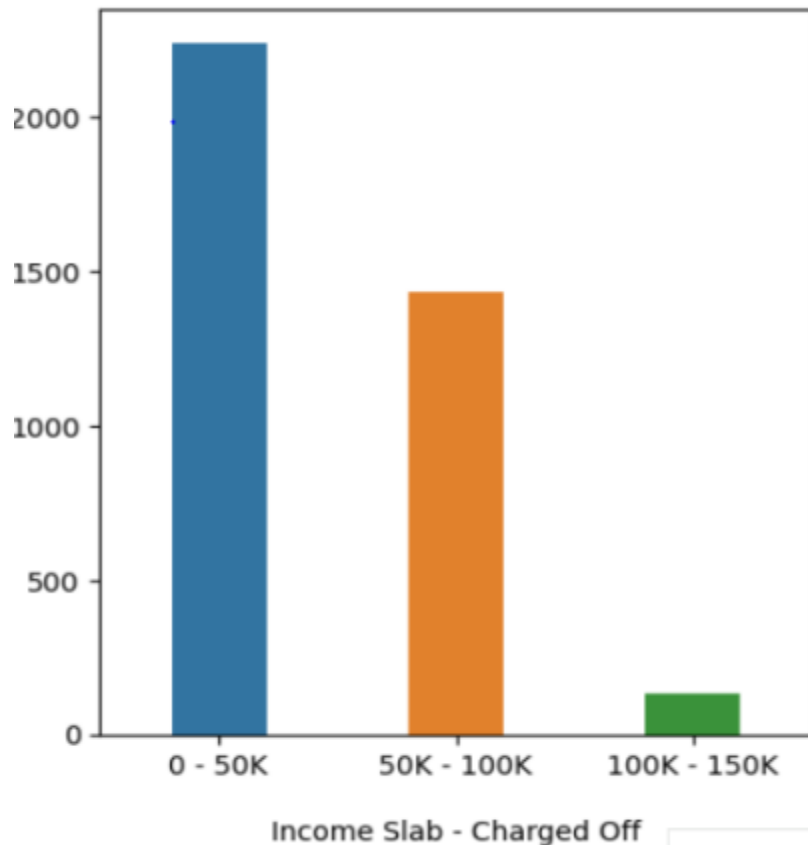
Term / Loan Status

- * 60 months loans are twice more likely to charge off than 36 months (60 month charged off versus 60 months loans issued)
- * More defaults in 60 months come from high funded amounts and from amounts below 3K

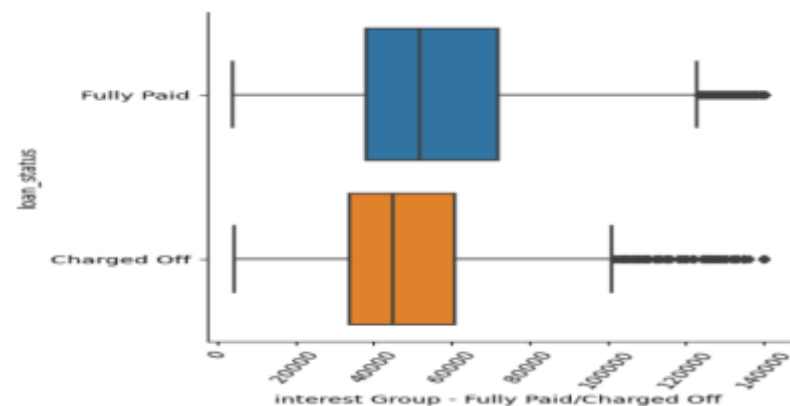


Bivariate Analysis

Income Slab / Loan Status



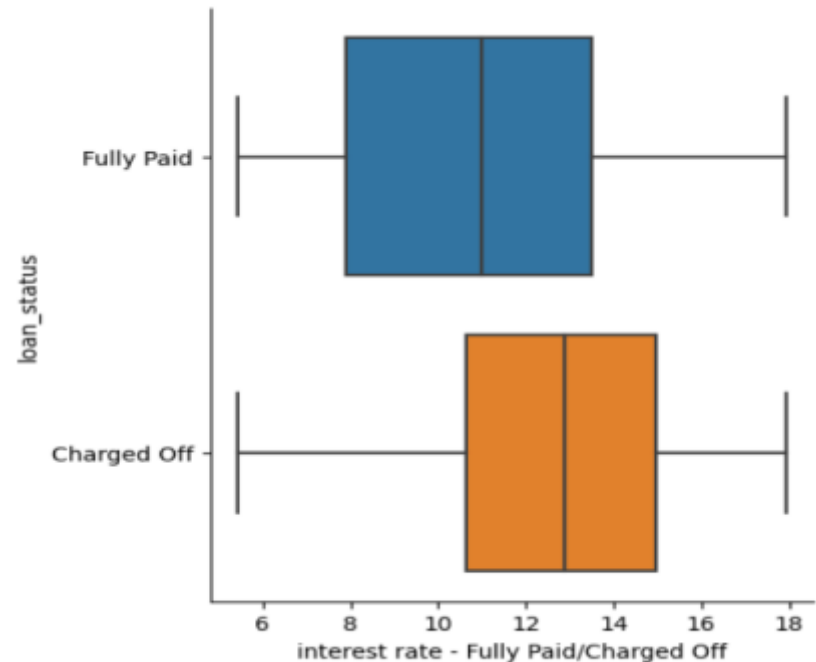
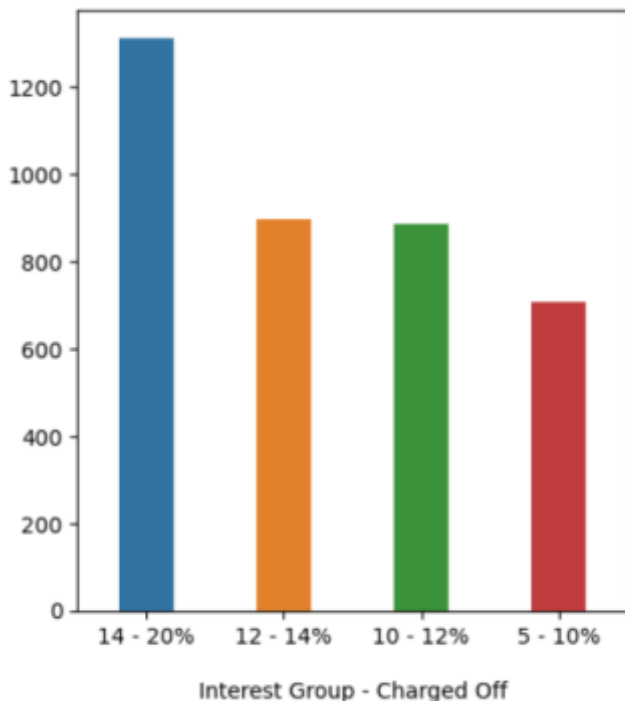
- * 4.7% more defaults in income below 50K when compared with 50-100K
- * 4% more defaults in income below 100K when compared with 100-150K
- * Defaults of 19% and 26% in income group below 50K for loan amounts above 15K
- * The defaults 14% and 16.9% for income range 50-100K for loan amounts 15K and above



Bivariate Analysis

Interest rate/ Loan Status

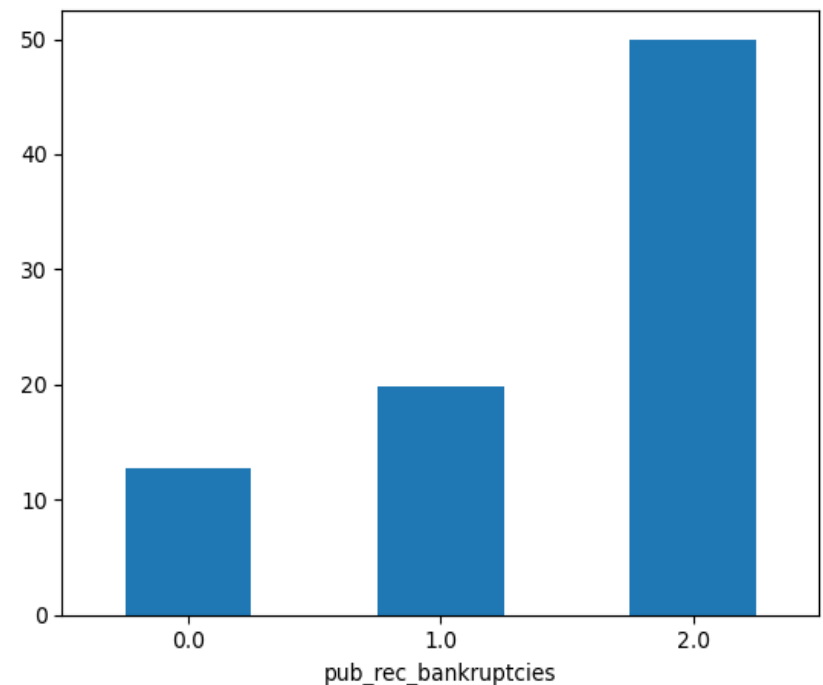
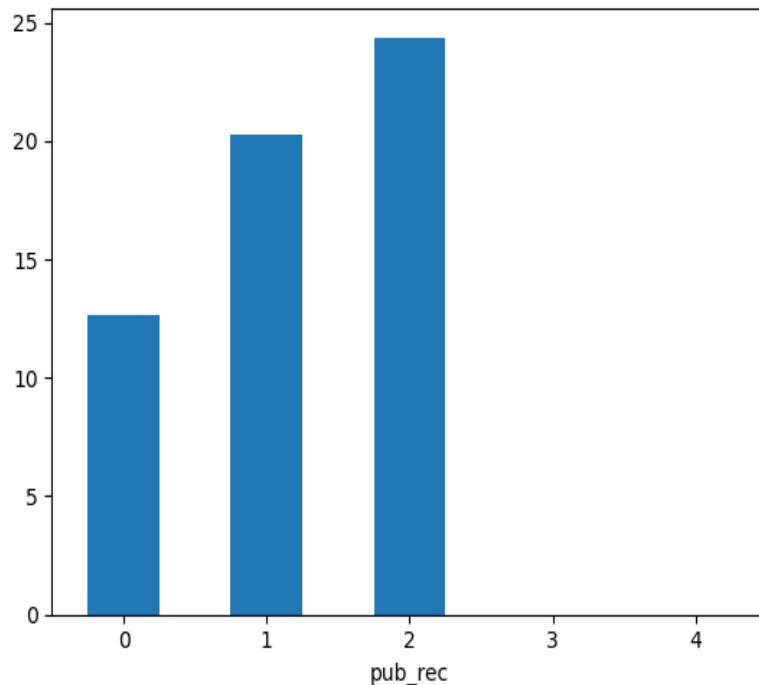
- * We see the 21.4% defaults in high interest loans (14% +)
- * The interest rate is directly proportional with loan defaults
- * Lower interest rates are preferable



Bivariate Analysis

Public Records & Inquiries

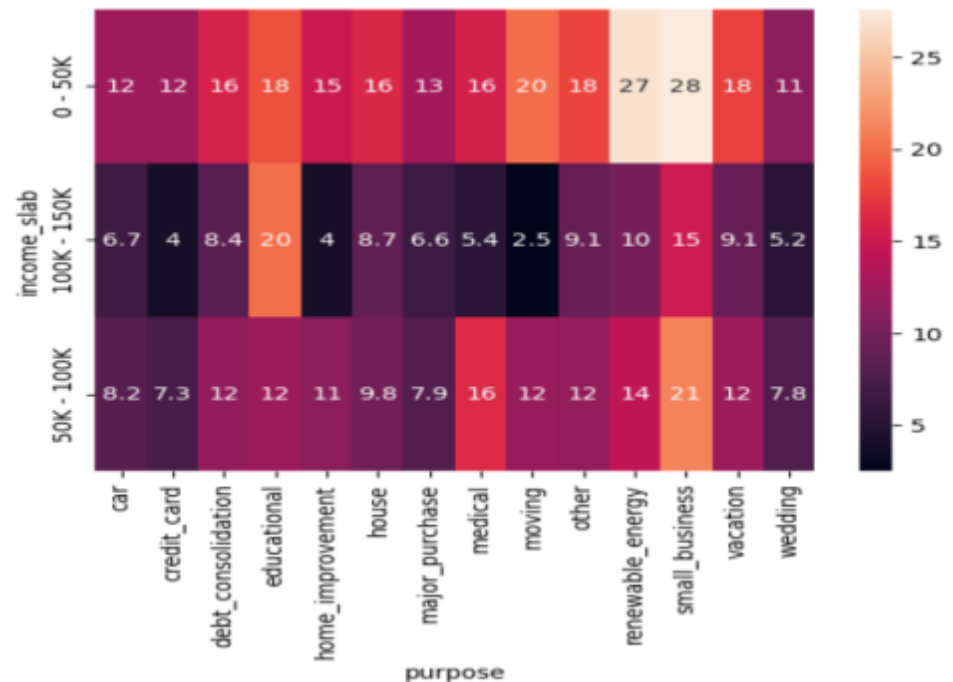
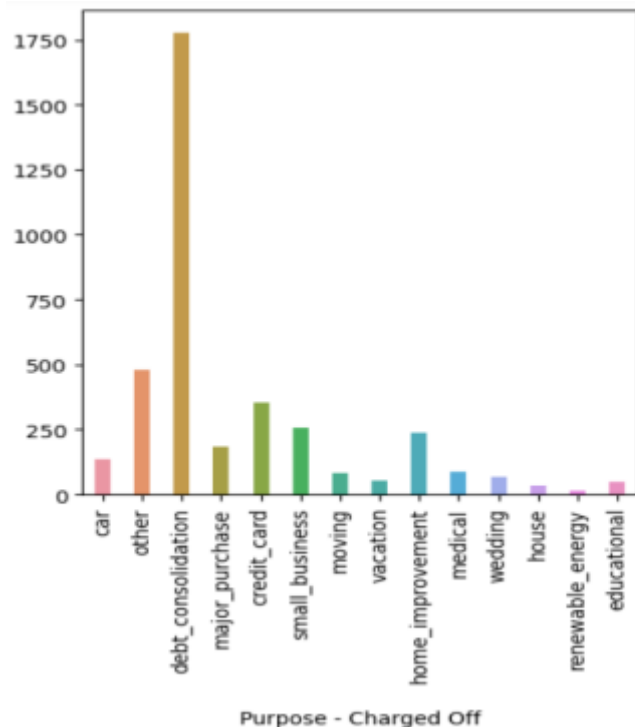
- * Applicants with public record bankruptcies / derogatory public records more likely to default
- * Applicants having inquiries in last 6 months default more
- * **Prefer 0 inquiries, 0 public records and 0 public record bankruptcies**



Bivariate Analysis

Purpose

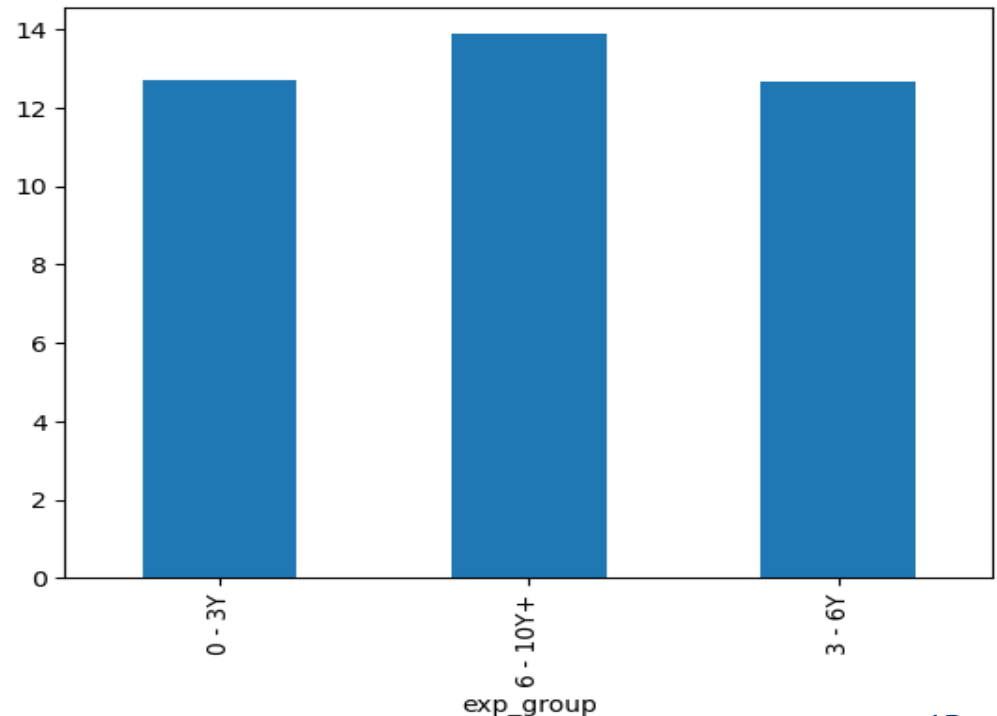
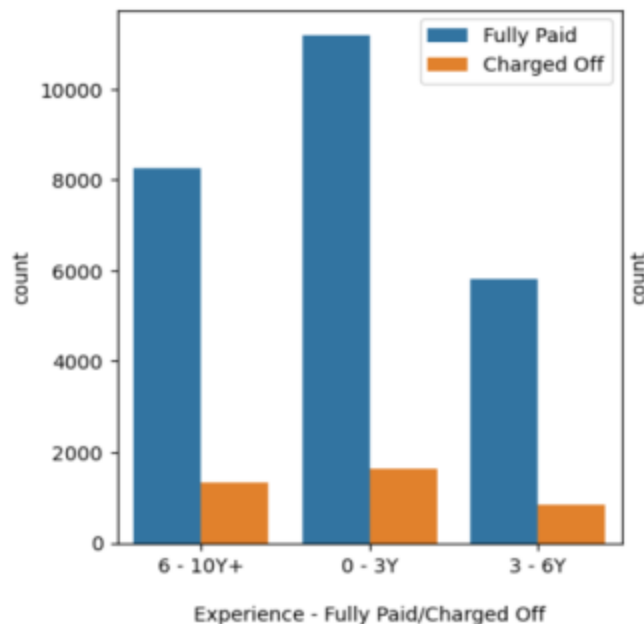
- * Small businesses, education and renewable energy are the top 3 defaults in loan categories
- * Small businesses most likely default in income slabs below 50K and higher than 100K
- * For income range 50-100K, education is the top contributor followed by small businesses



Bivariate Analysis

Employment Length

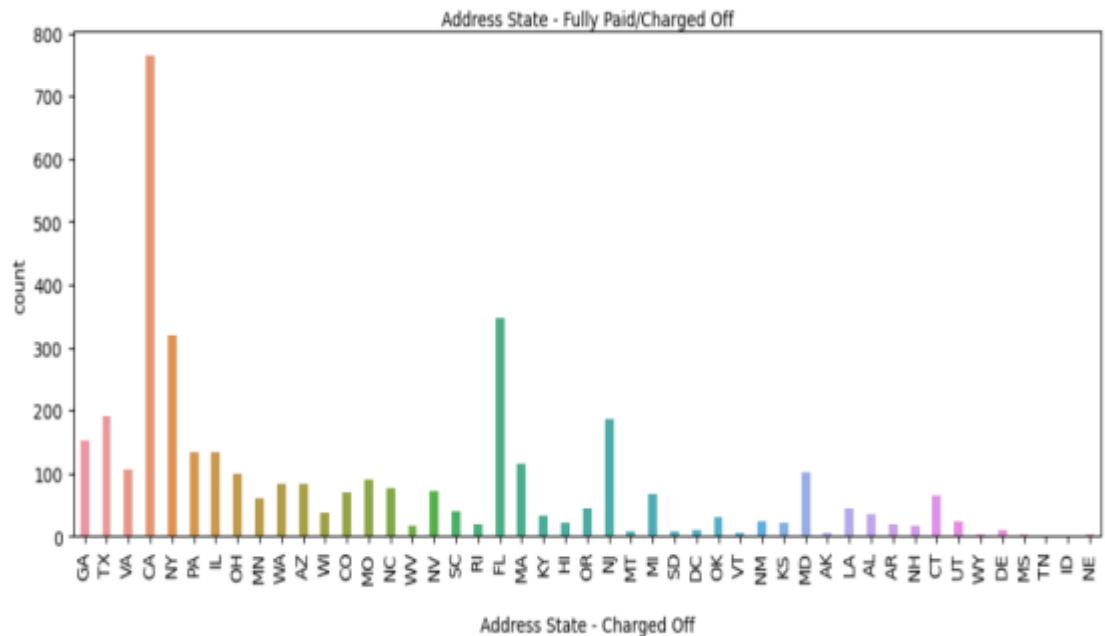
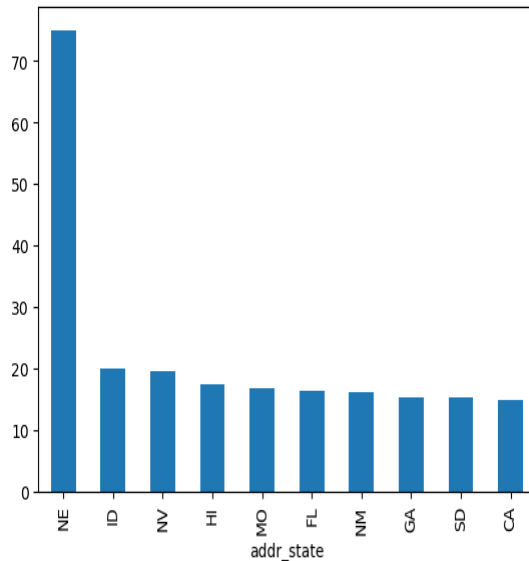
- * We have more borrowers who have fully paid and charged off in **0-3Y** employment length
- * Borrowers in **6-10Y** employment length default more when compared with total borrowers in the same group
- * More default comes from large fund amounts (12K or more) and the surprisingly amounts below 3K also that they borrow and are not able to repay



Bivariate Analysis

State

- * We have more borrowers who have fully paid and charged off from **CA and FL**
- * Borrowers in **NE, ID and NV** default more when compared with total borrowers in the same area
- * More verification preferred for top 10 default regions marked in the graph below



Recommendations to Lending Club

1. Verify applicants before providing loans
2. Consider revisiting or improving the verification process as verified applicants also default more
3. Recommend applicants from Grades A and B. Applicants from Grade C and above have higher default rates
4. More caution and verification is recommended for funding higher amounts with a tenure of 60 months as they tend to default more
5. Recommend more controls while funding applicants with multiple open accounts as they default more
6. Recommend lower interest rates with thorough evaluation of other factors like annual income etc. before choosing higher interest rates

Recommendations to Lending Club

1. Recommend caution while funding small businesses in general and specially in income range below 50K
2. Loans borrowed for education and renewable energy also default more. More verification/controls to be exercised in these categories
3. Loans funded with amounts 12K and above default more in all income groups specially in 6-10Y+. A better verification process needs to be exercised here
4. Recommend Not to fund applicants with Inquiries in last 6 months
5. Recommend Not to consider applicants with public records and public record bankruptcies
6. Recommend more verification for applicants coming from Nebraska, Nevada Idaho, California and Florida



THANK YOU