

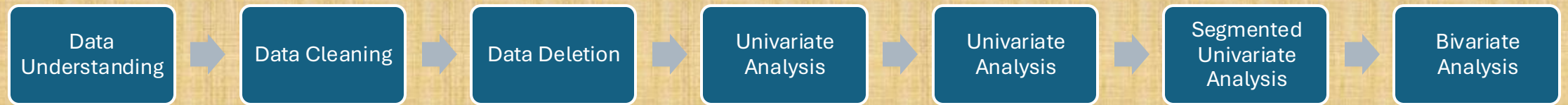
Lending Club Case Study

Group Member: Lakshmi Prashanth TS (anbk130@gmail.com)
Nisarg Shah (nisarg11493@gmail.com)

Objective:

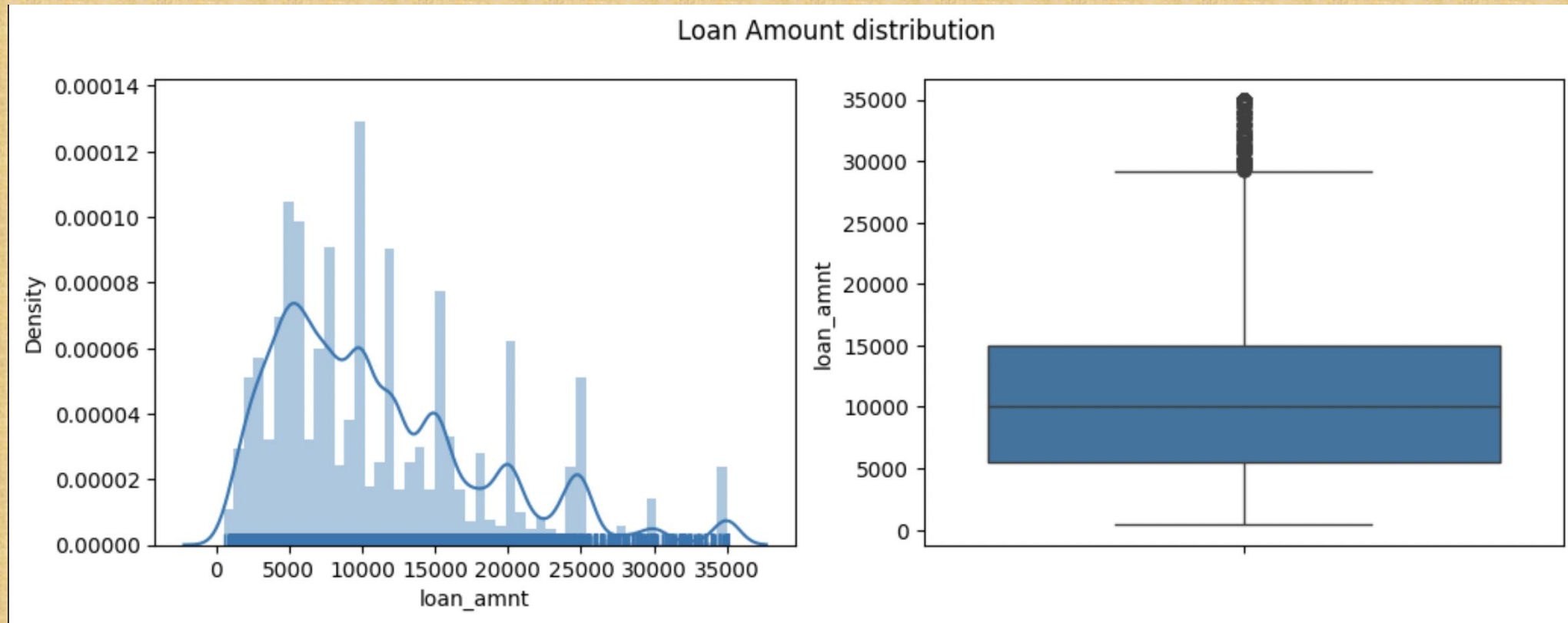
- consumer finance company which specialises in lending various types of loans to urban customers. When the company receives a loan application, the company has to make a decision for loan approval based on the applicant's profile. Two types of risks are associated with the bank's decision:
- If the 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.

Problem Solving Chronology



Data Analysis – Univariate Analysis

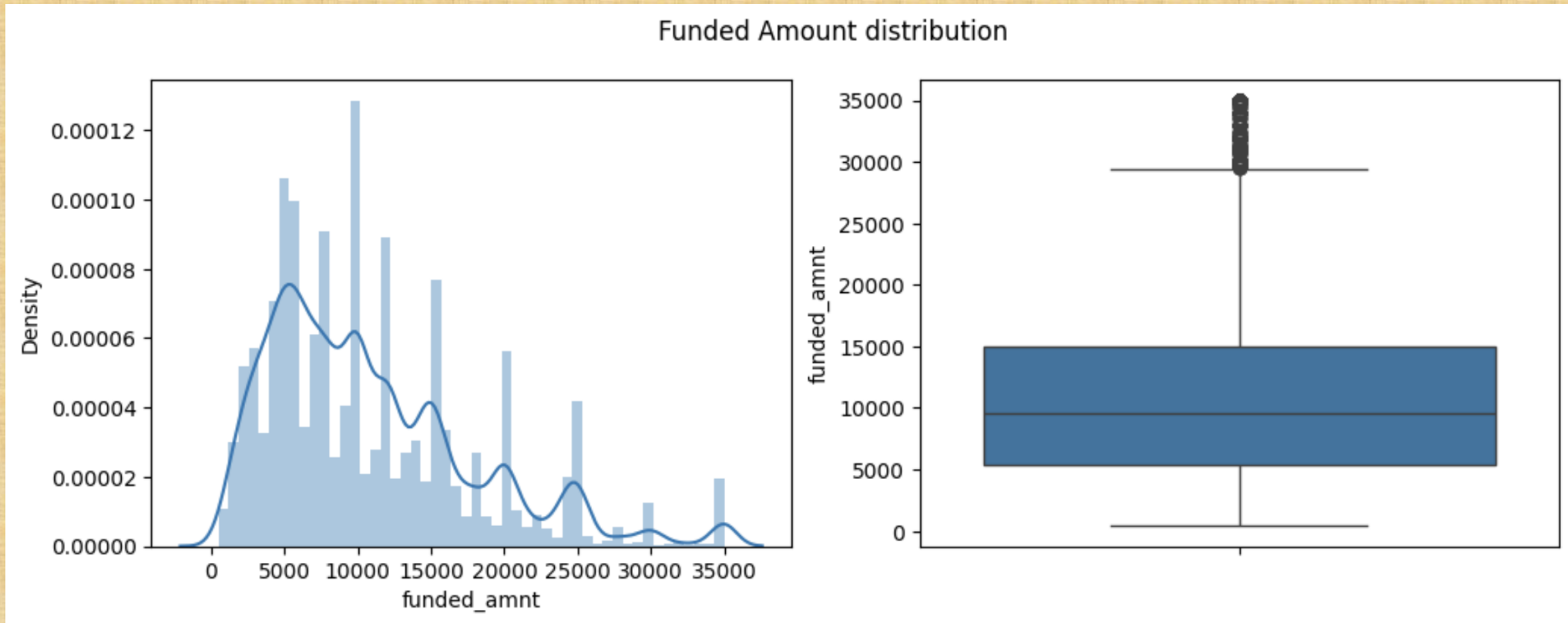
- Loan Amount Analysis



- Observation :
- From the above plots, more number of people took loan amount of 10000, and also median of distribution is 10000. And very few people took more than 30000 loan amount

Data Analysis – Univariate Analysis

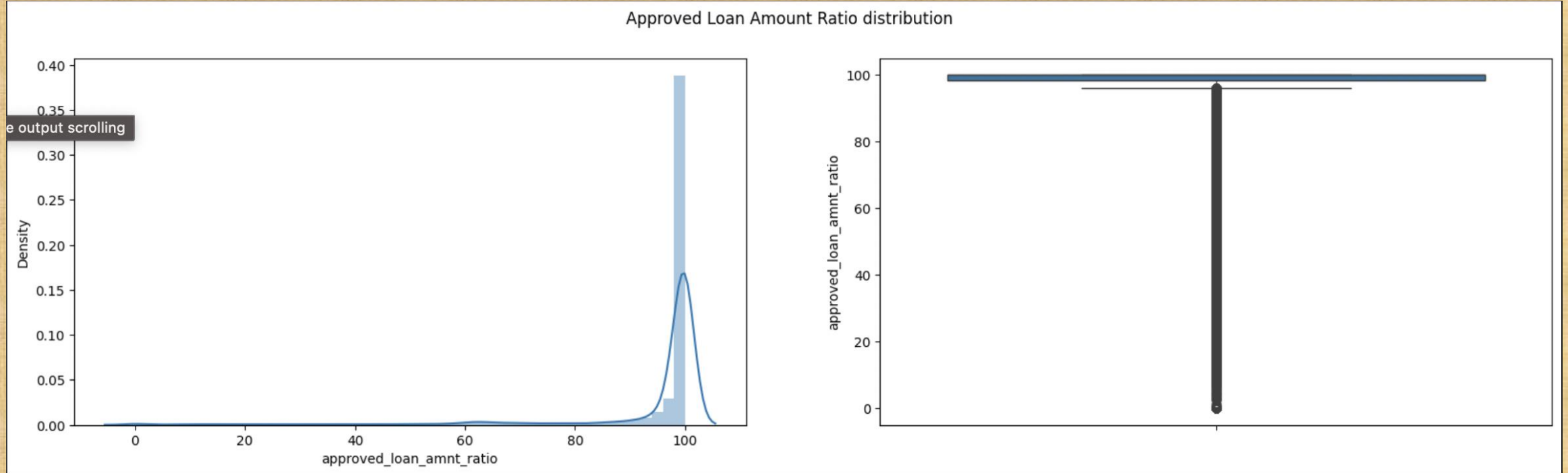
- Funded Amount Analysis



- Observation :
- Funded amount data behaves similar to loan Amount, Which tells us that Lending club approved most of Applied loan amount.

Data Analysis – Univariate Analysis

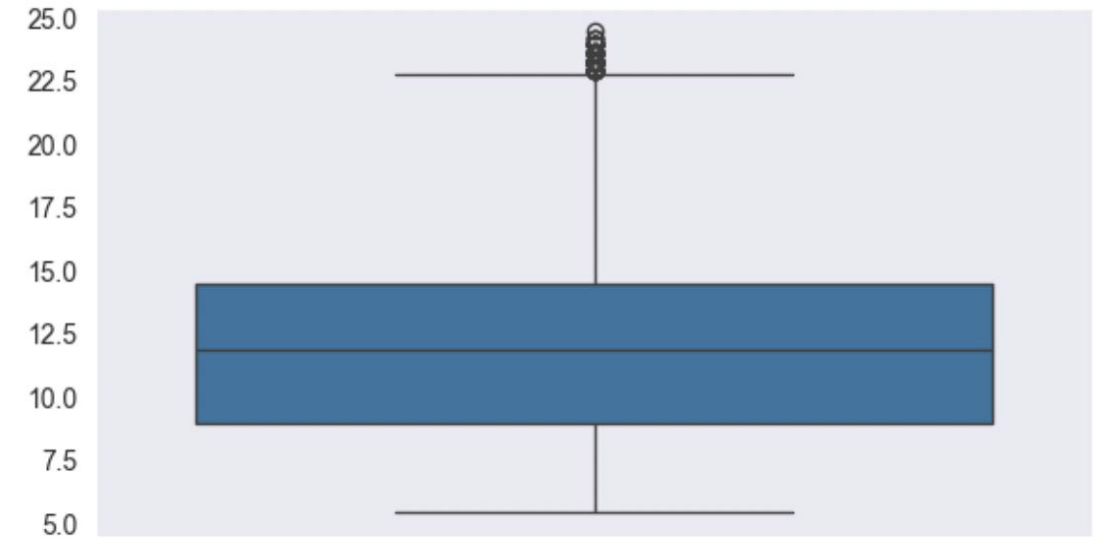
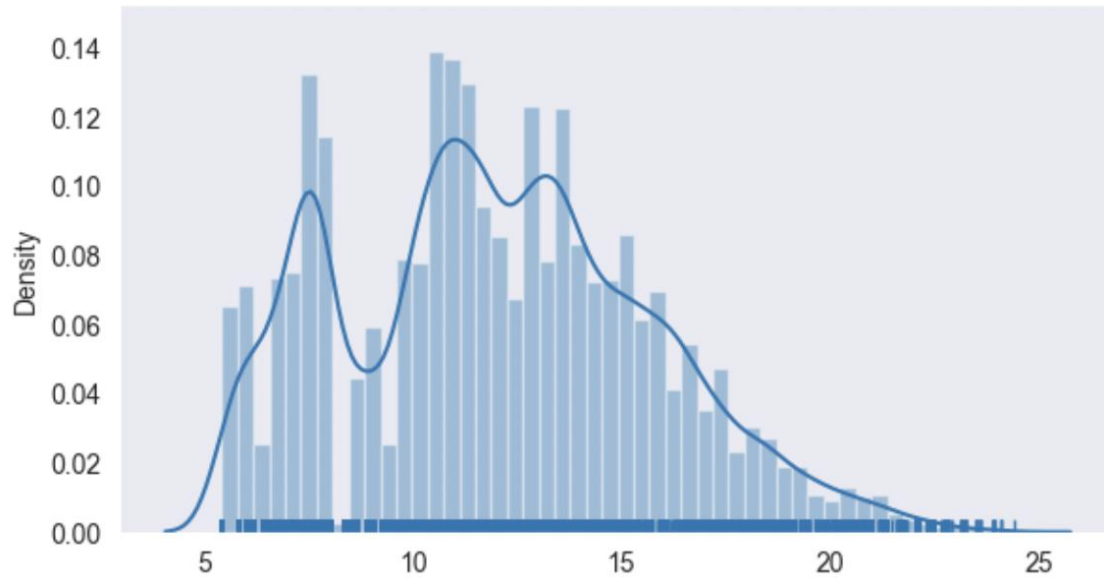
- **Approved Loan Amount Ratio**



- Observation :
- 70% of Borrowers got 100% loan amount from investors.

Data Analysis – Univariate Analysis

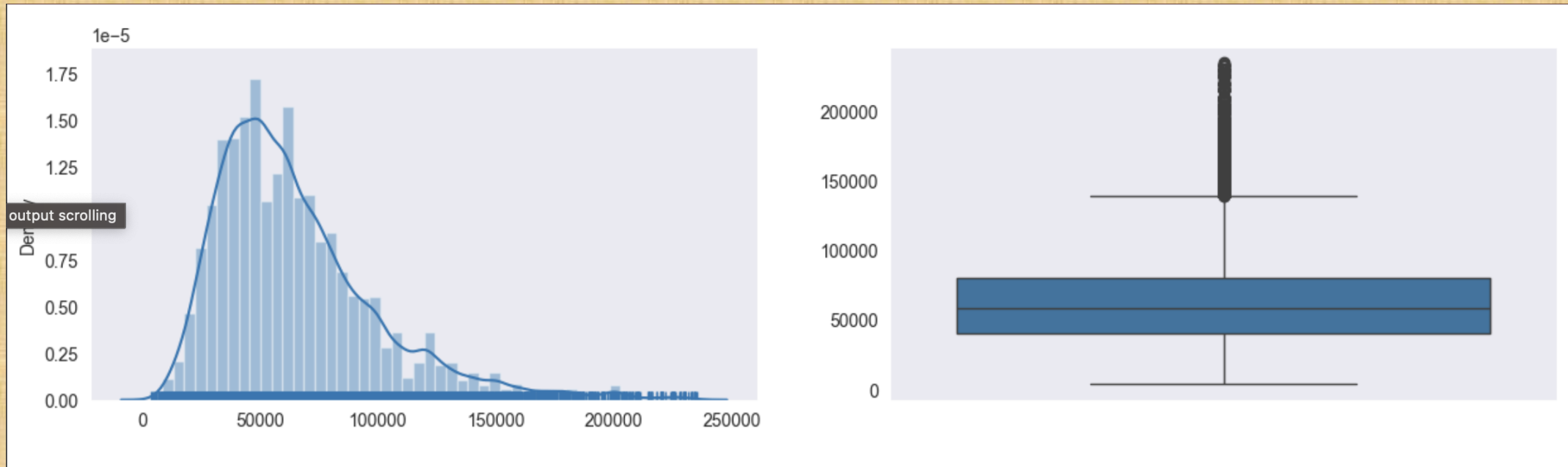
- Interest Rate



- Observation :
- Plots show that most of the Interest Rates on loans are in range of 10% - 15%
- Some people took loan at higher rates of interest i.e., 22.5%

Data Analysis – Univariate Analysis

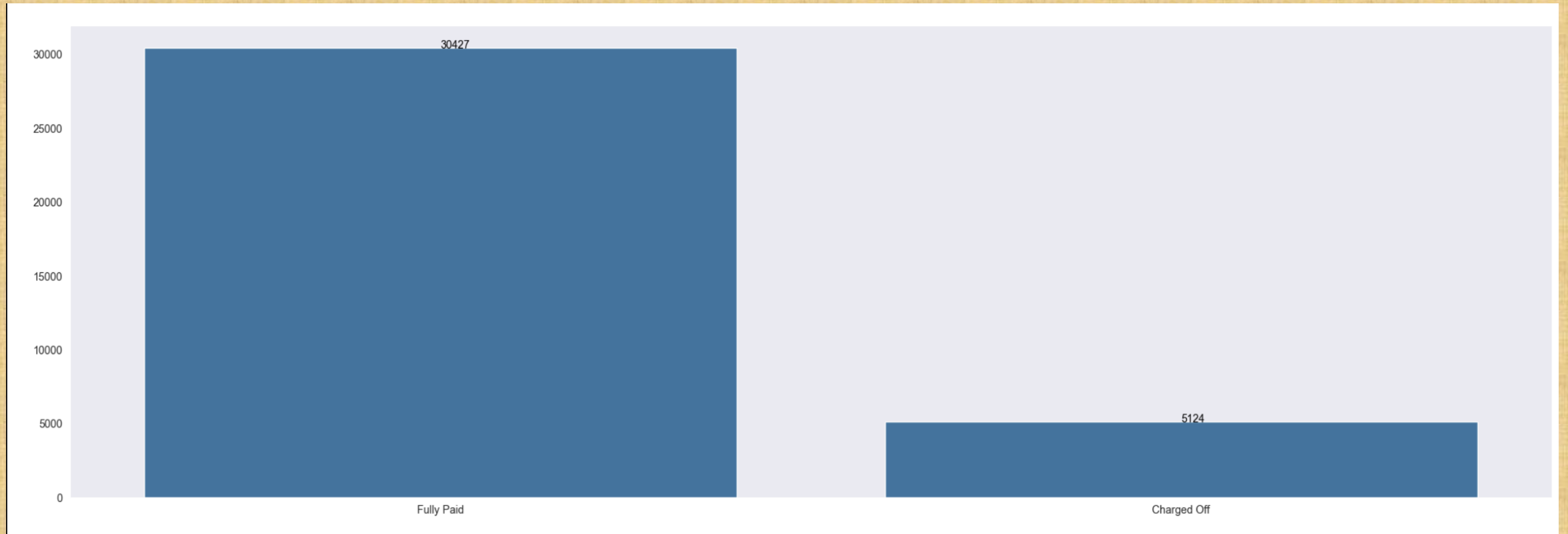
- Annual Income



- Observation :
- Plots show that most of the borrower's Annual incomes are in range of 40000- 80000

Data Analysis – Unordered Categorical variables

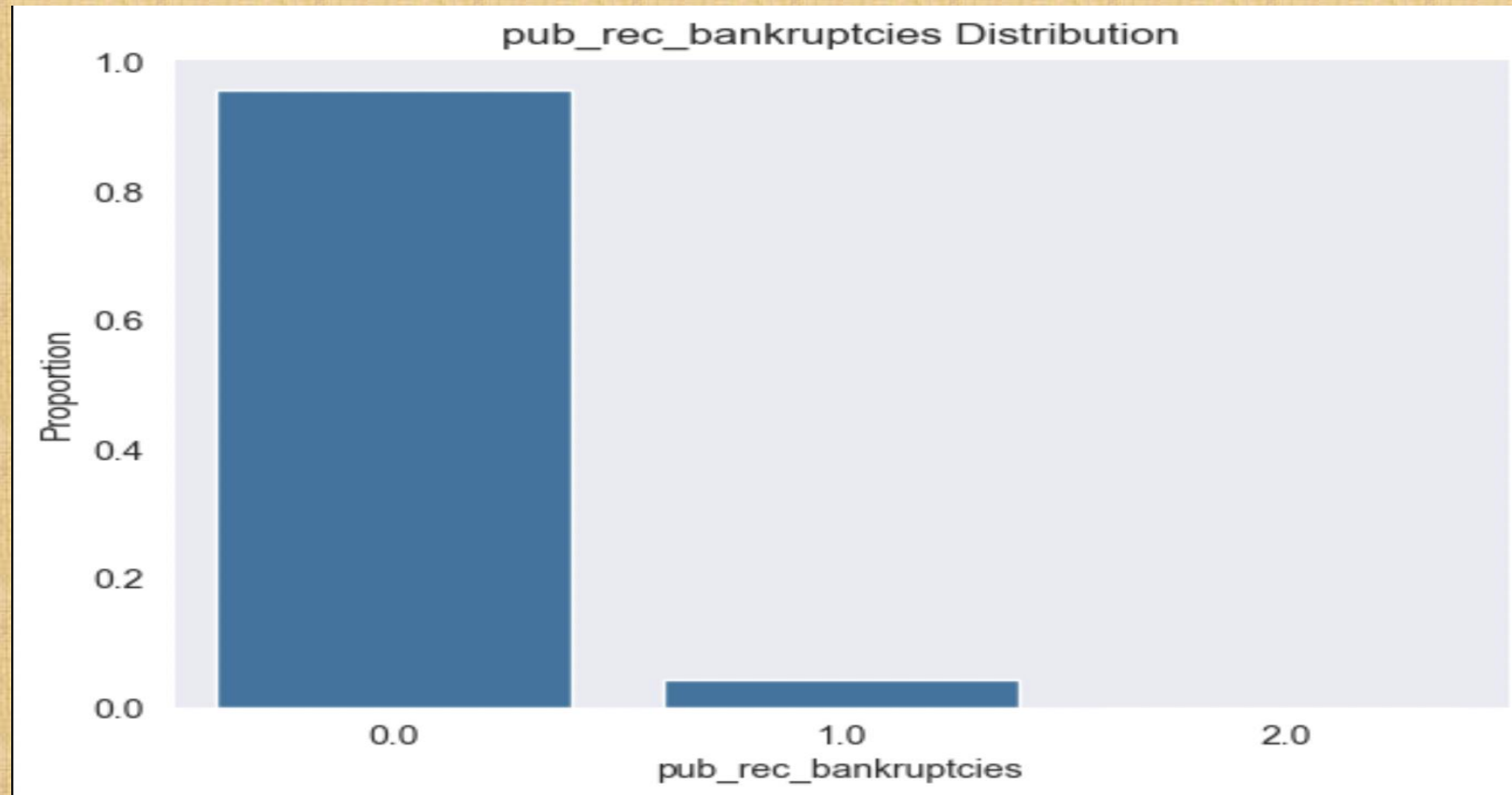
- **Loan Status**



- Observation :
- plot shows that close to 14% loans were charged off out of total loan issued

Data Analysis – Unordered Categorical variables

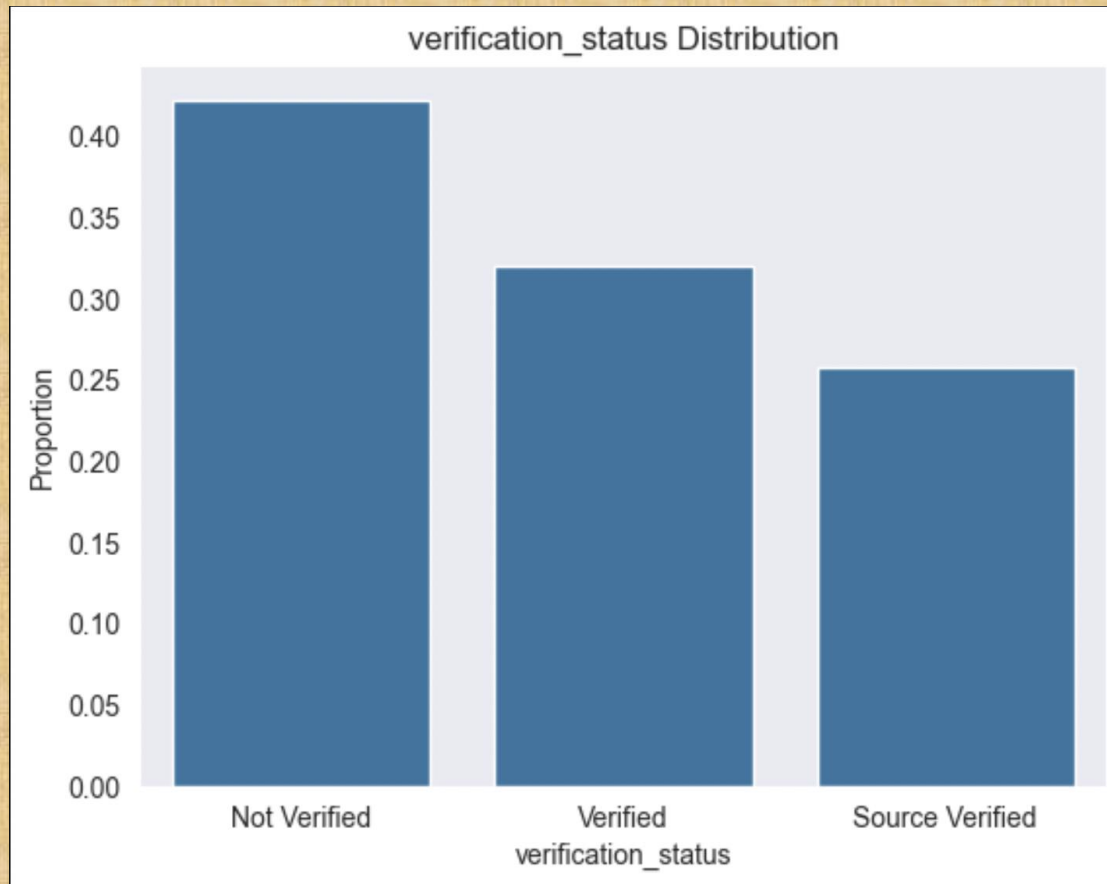
- **pub_rec_bankruptcies**



- Observation :
- 99% people have not gone bankrupt.

Data Analysis – Unordered Categorical variables

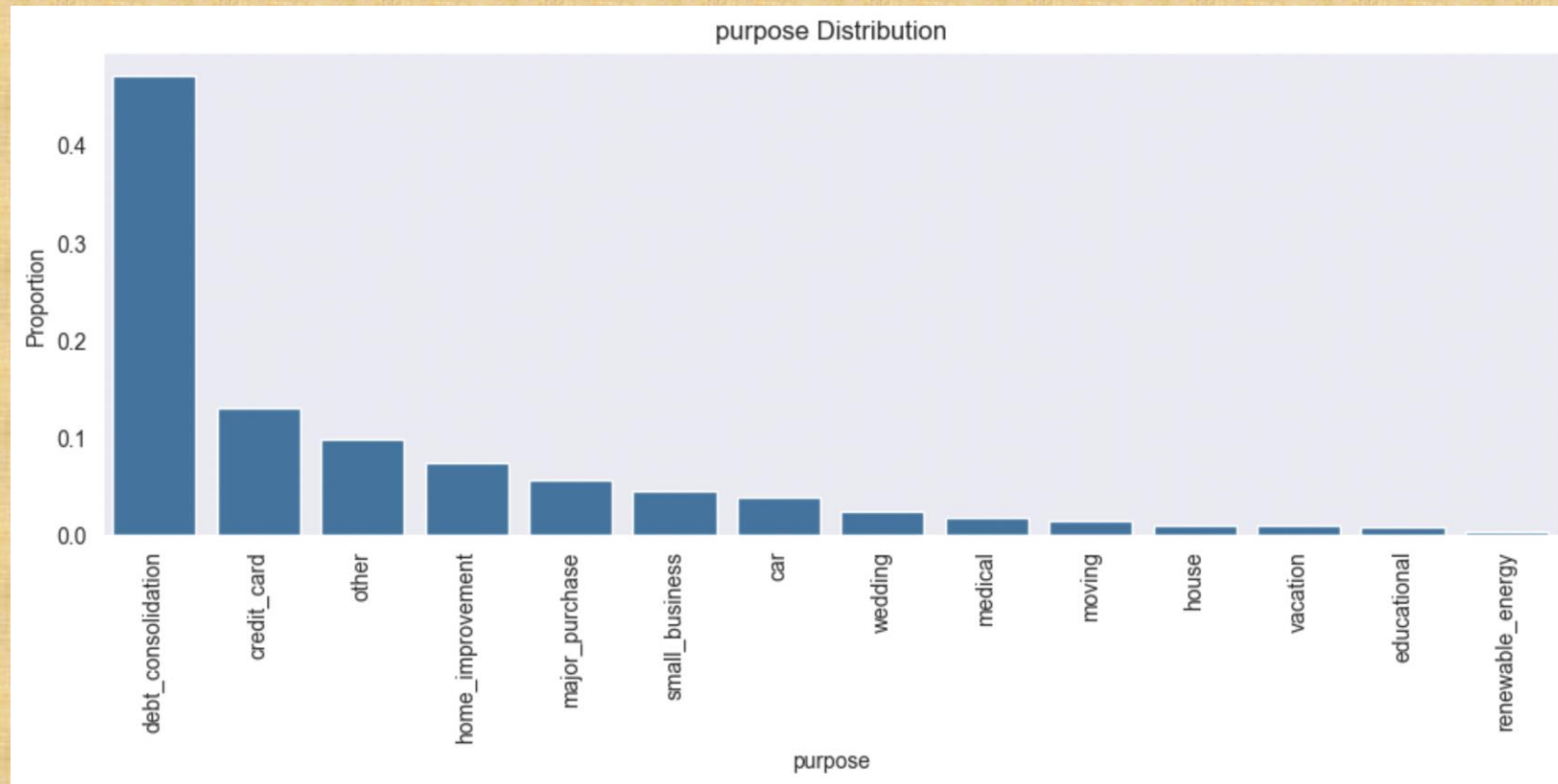
- **Verification status**



- Observation :
- Majority of loans were given without verification of applicants income.

Data Analysis – Unordered Categorical variables

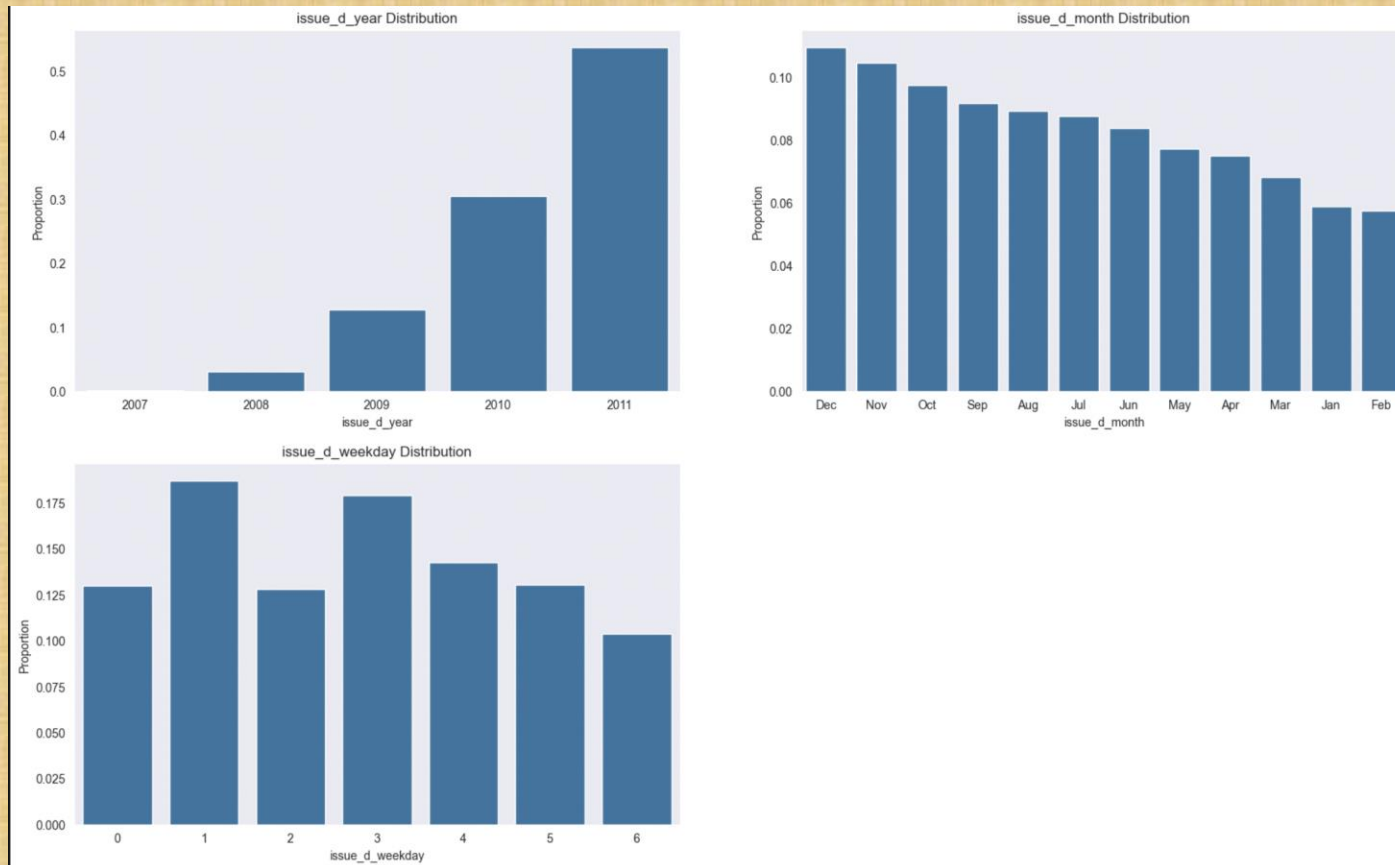
- Purpose



- Observation :
- Looks like more number of people took loan for debt consolidation and a very few people took for renewable energy.

Data Analysis – Ordered Categorical variables

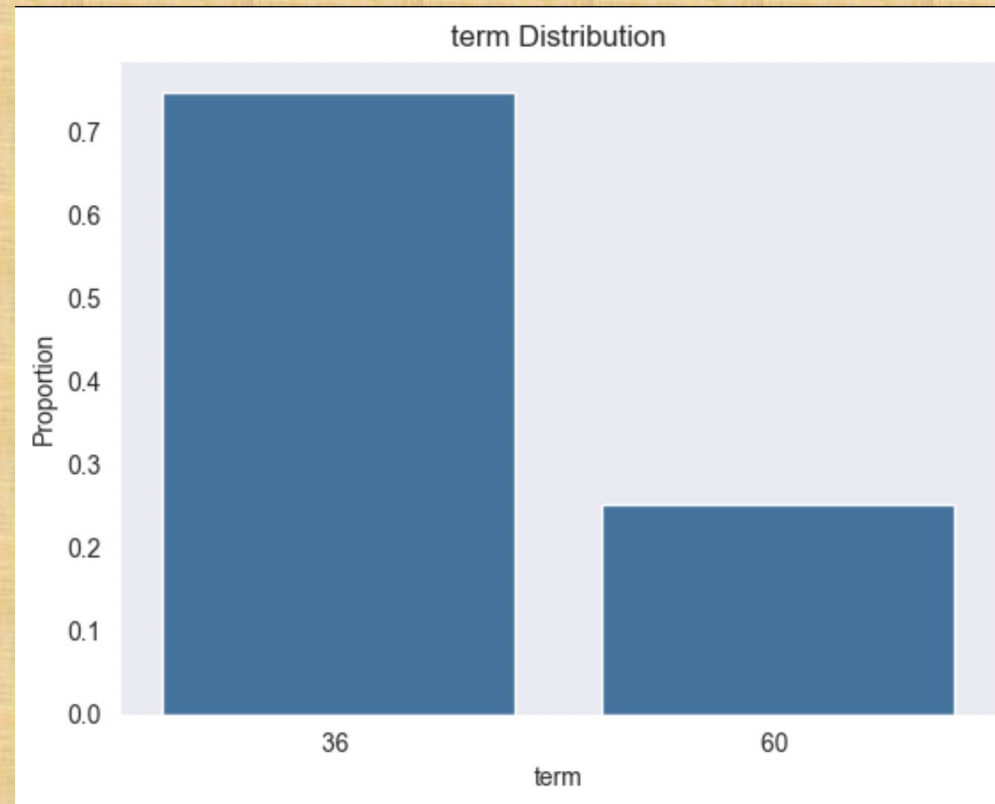
- Loan issue Date(year, month)



- Observation :
- The lending club(LC) has doubling loan issues every year.
- There are more issues of loan in last 3 months every end of the ear i.e., Oct, Nov and Dec.
- LC has issued more loans on tuesday and wednesday than other weekdays.

Data Analysis – Ordered Categorical variables

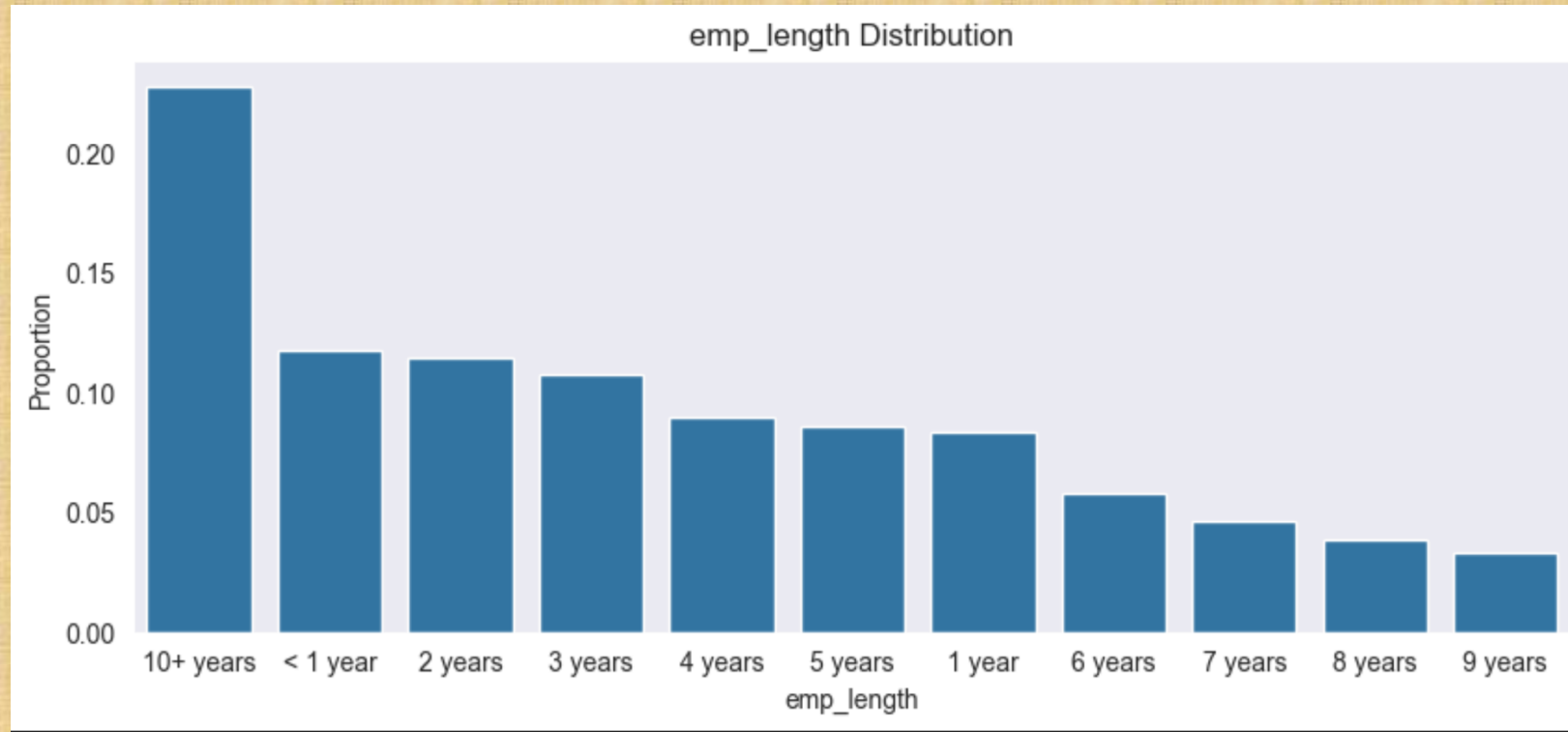
- Loan issue Term



- Observation :
- Borrowers have taken 36 months tenure more than 60 months.

Data Analysis – Ordered Categorical variables

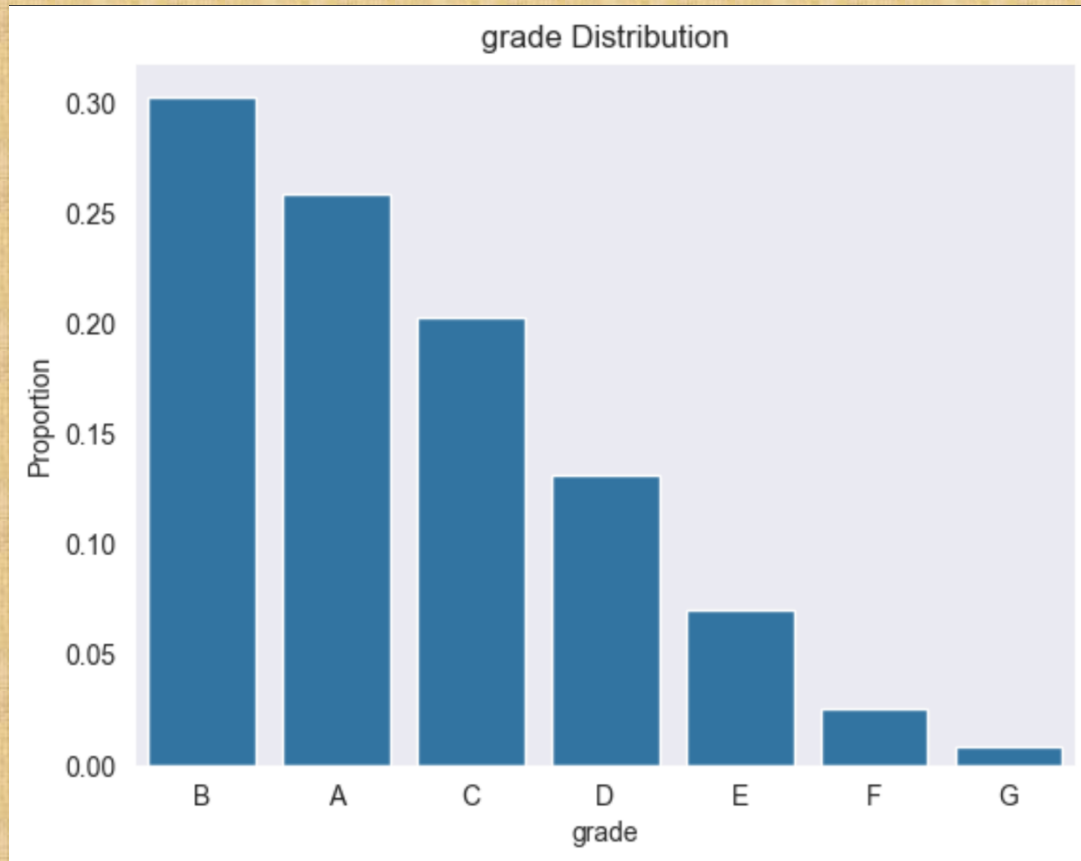
- Employment length



- Observation :
- Borrowers are mostly 10+ years emploment length.

Data Analysis – Ordered Categorical variables

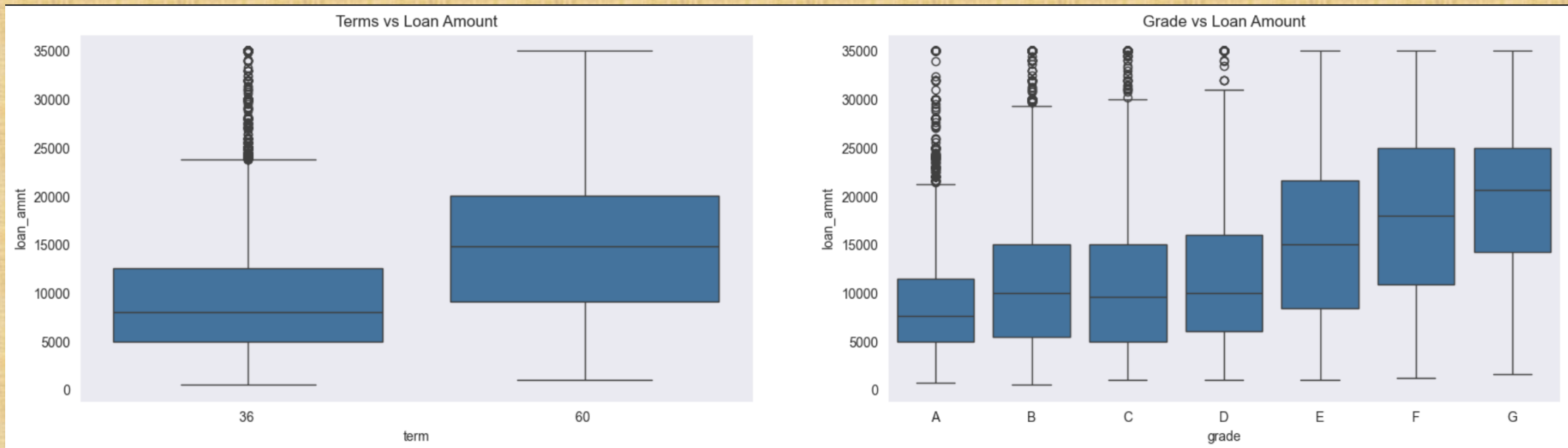
- Grade



- Observation :
- Most borrowers fall under A and B grades then other grades.

Data Analysis – Segmented Univariate Analysis

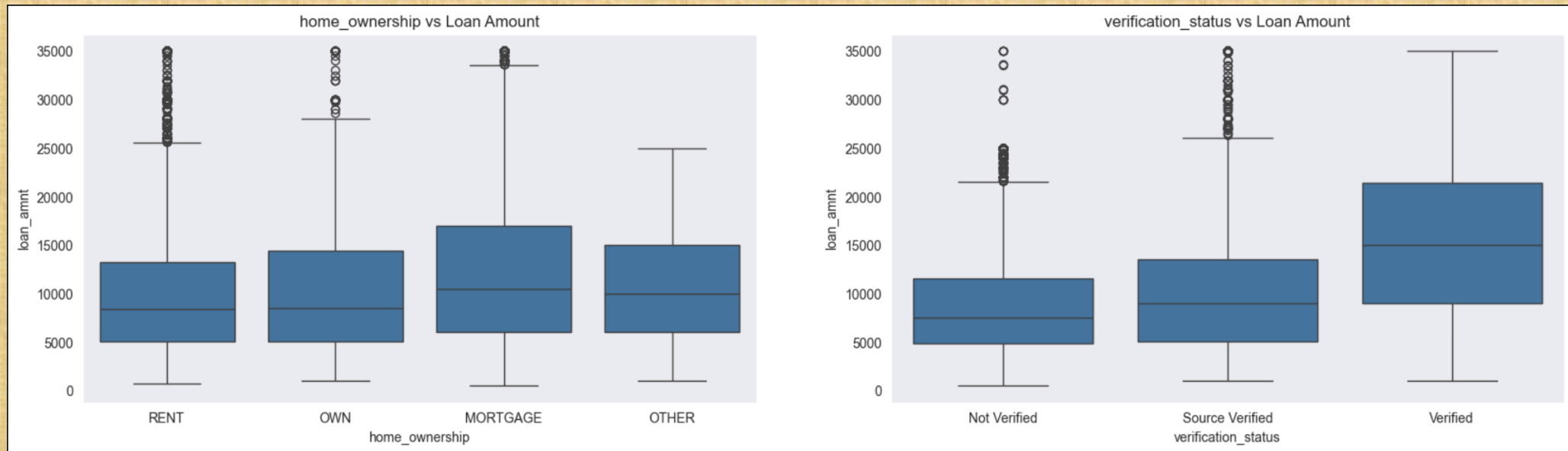
- **Loan Amount**



- Observation :
- Higher amount loans have high tenure i.e, 60 months.
- Grade 'G' and 'H' have taken max loan amount. As Grades are decreasing the loan amount is increasing.

Data Analysis – Segmented Univariate Analysis

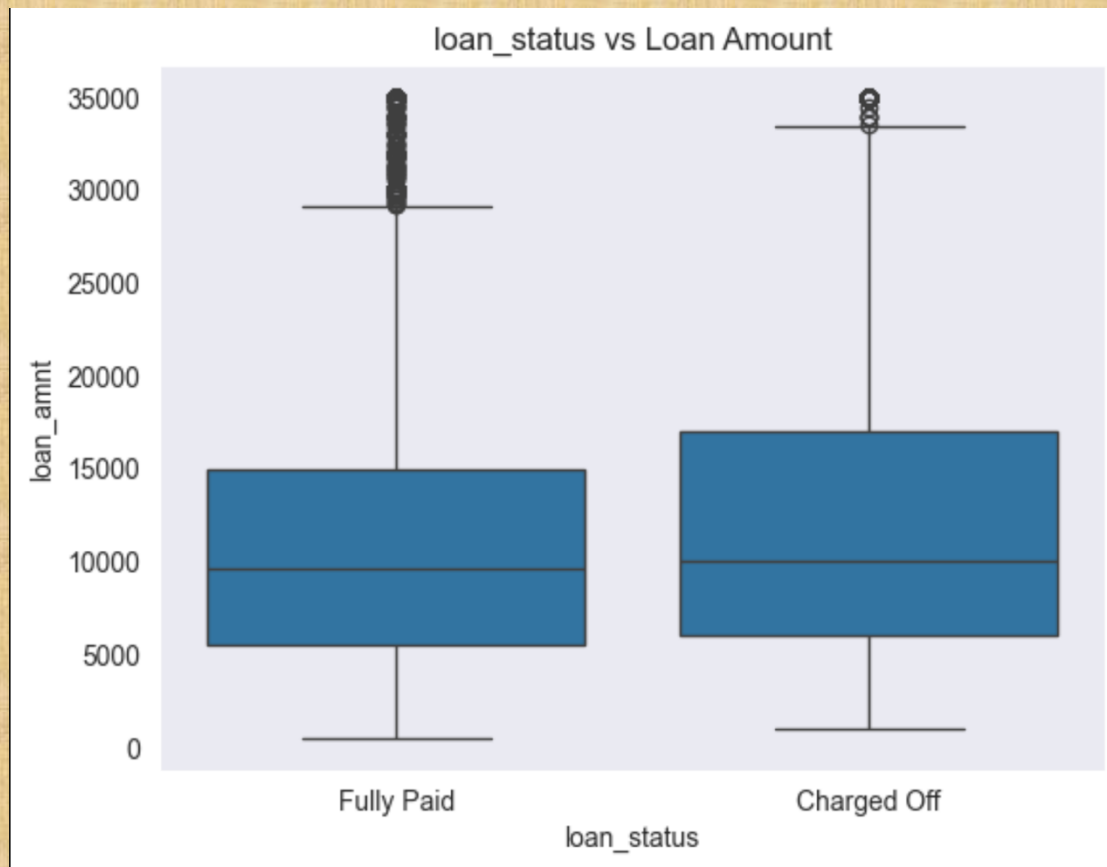
- **home_ownership vs Loan Amount** and **verification_status vs Loan Amount**



- Observation :
- more borrowers are from MORTGAGE and also the median loan amount also high for MORTGAGE owned borrowers. And most of borrowers are verified for borrowing loan >9k.

Data Analysis – Segmented Univariate Analysis

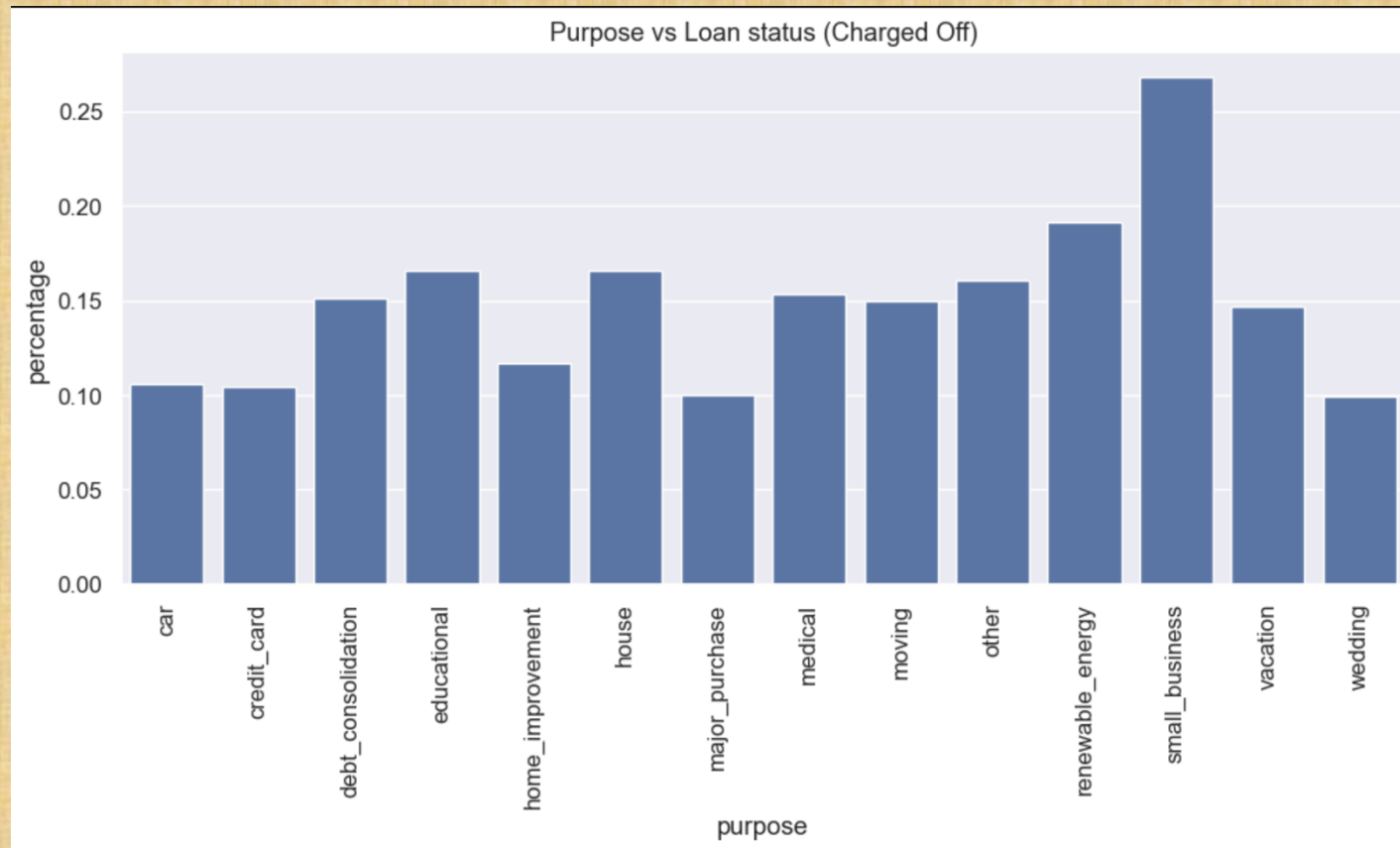
- **Loan_status vs Loan Amount**



- Observation :
- Charged Off loans have higher amounts than Fully Paid ones.

Data Analysis – Bivariate Analysis

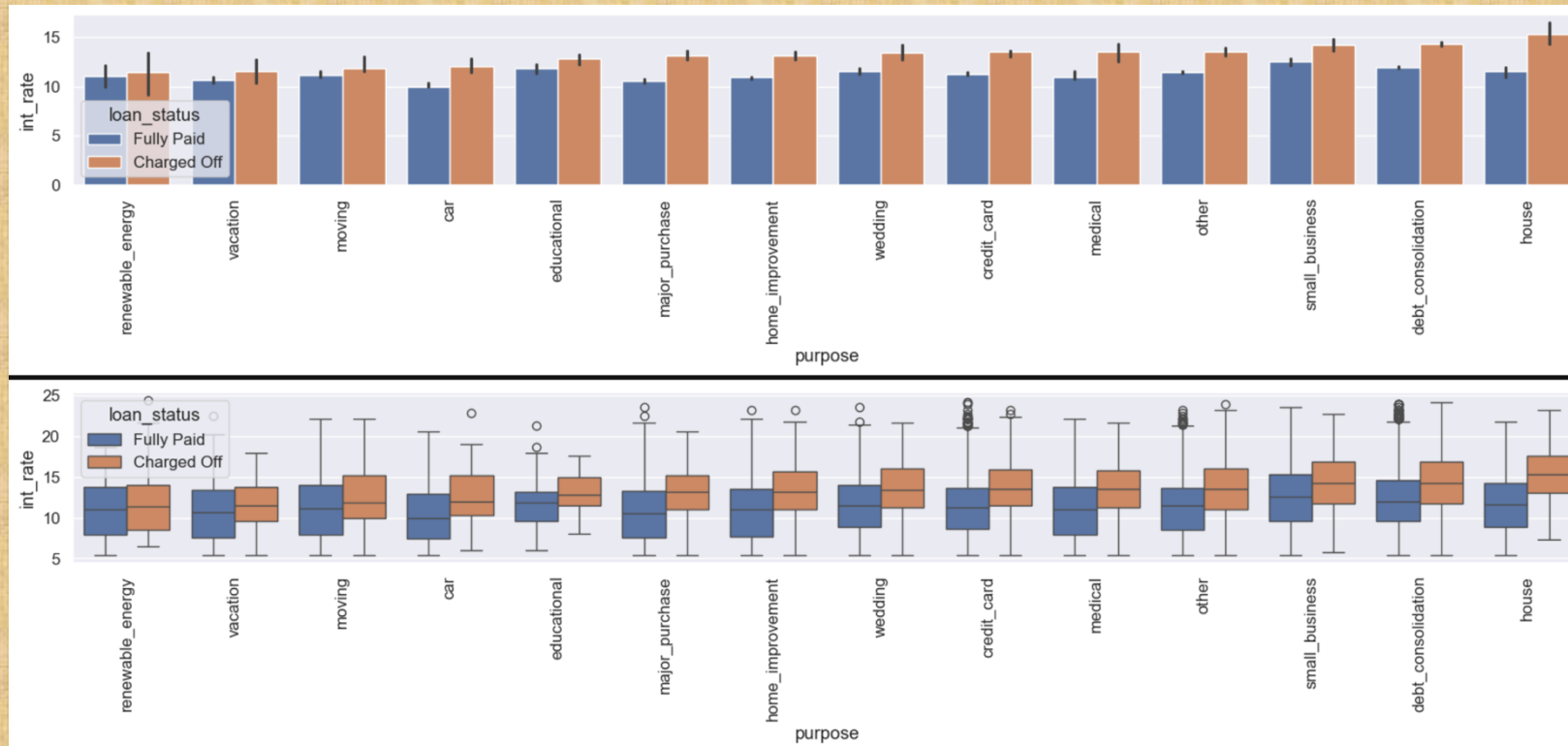
- Purpose vs Chargedoff_Proportion



- Observation :
- Charged-off are higher for small_business comparatively.

Data Analysis – Bivariate Analysis

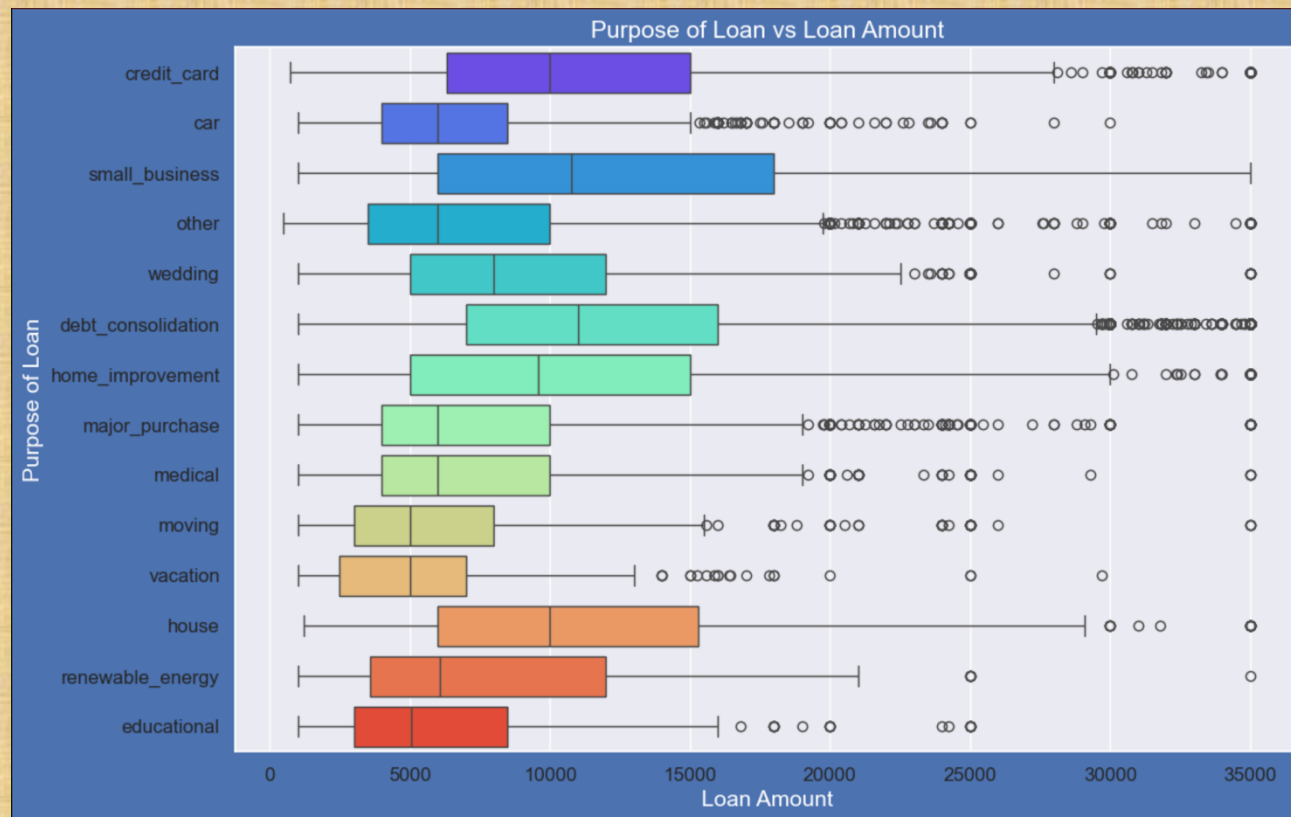
- Purpose vs interest rate



- Observation :
- Home loans with high interest rates are mostly defaulted. Even small business and debt consolidation has similar observation.

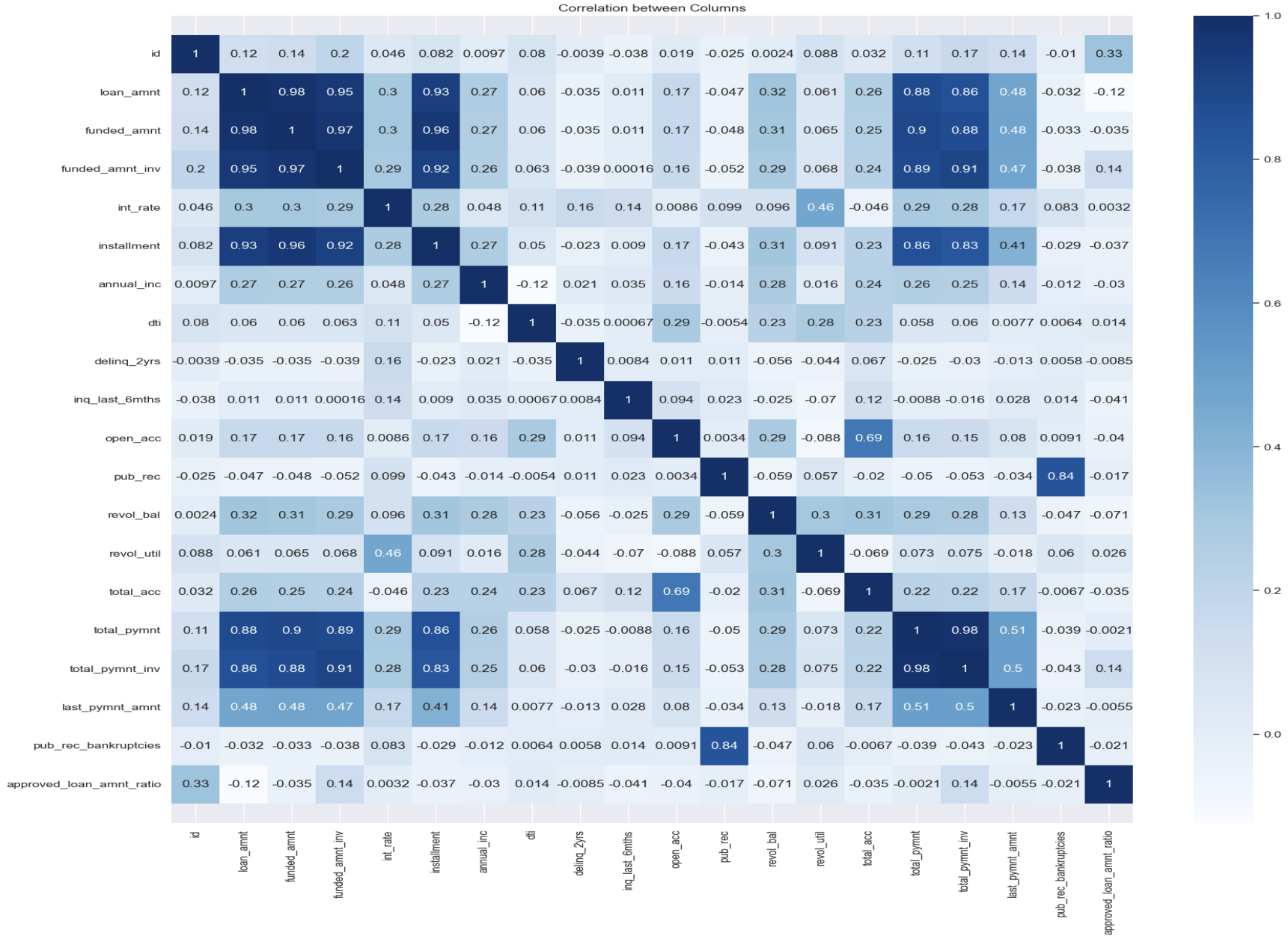
Data Analysis – Bivariate Analysis

- Purpose of loan vs Loan amount



- Observation :
- Median, 95th percentile, 75th percentile of loan amount is highest for loan taken for small business purpose among all purposes.
- Debt consolidation is second and Credit card comes 3rd.

Data Analysis – Correlation Matrix



- Observation :
- Observation is that Loan amount, investor amount, funding amount are strongly correlated.
- Annual income with DTI(Debt-to-income ratio) is negatively correlated. Debt income ratio is the percentage of a consumer's monthly gross income that goes toward paying debts.
- That means when annual income is low DTI is high & vice versa.
- positive correlation between annual income and employment years.

• Summary :

DATA ANALYSIS

- Univariate Analysis:

1. Funded amount analysis shows lending club has approved most of the loans.
2. Most of the interest rates are in between 10-15% and few has rates > 22.5%.
3. Most of the borrower's Annual incomes are in range of 40000- 80000.

- Unordered Category List:

1. Close to 14% loans were charged off out of total loan issued.
2. 99% people has gone bankrupt.

- Ordered Categorical List:

1. The lending club(LC) has doubling loan issues every year.
2. Borrowers are mostly 10+ years emploment length.

- Segmented Univariate Analysis:

1. Higher amount loans have high tenure i.e, 60 months.
2. Charged Off loans have higher amounts than Fully Paid ones.

- Bivariate Analysis:

1. For higher interest rates the default rate is higher in both 36- and 60-months tenure.
2. Small Business has more defaults when the loan amount is also high.

- Correlation Matrix:

1. Observation is that Loan amount, investor amount, funding amount are strongly correlated.
2. Annual income with DTI(Debt-to-income ratio) is negatively correlated. Debt income ratio is the percentage of a consumer's monthly gross income that goes toward paying debts.
3. That means when annual income is low DTI is high & vice versa.
4. Positive correlation between annual income and employment years.