

Lending Club Case study

Lending Club is an online lending marketplace, facilitating personal loans and business loans which allows borrowers to shop loans at competitive rates.

Problem Statement:

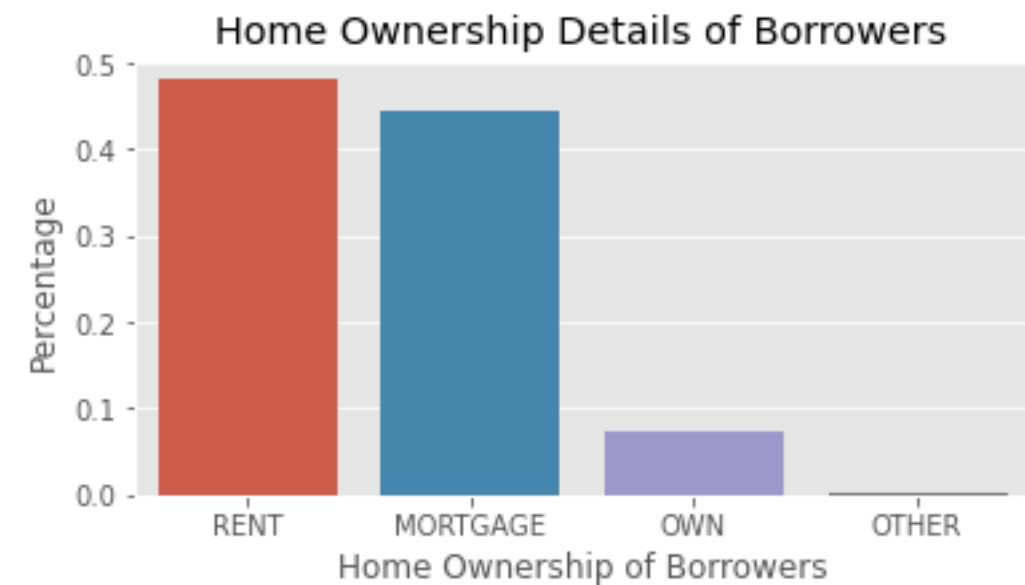
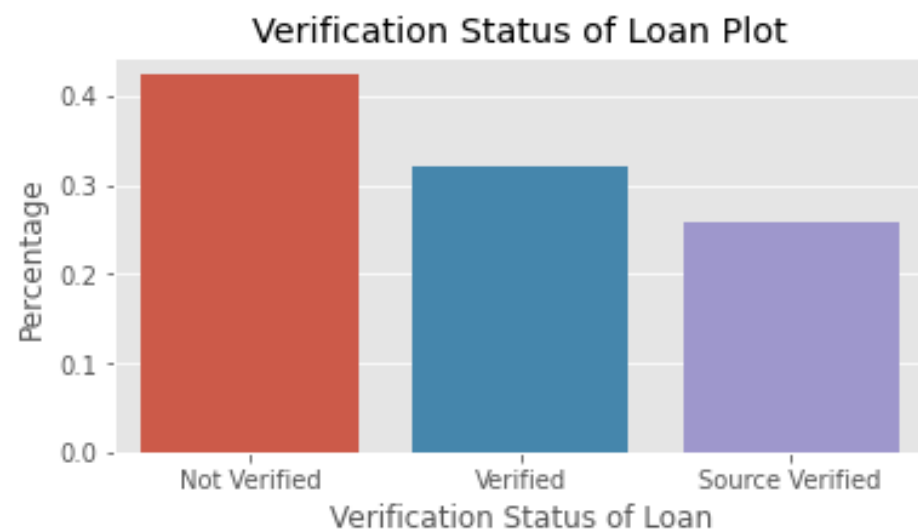
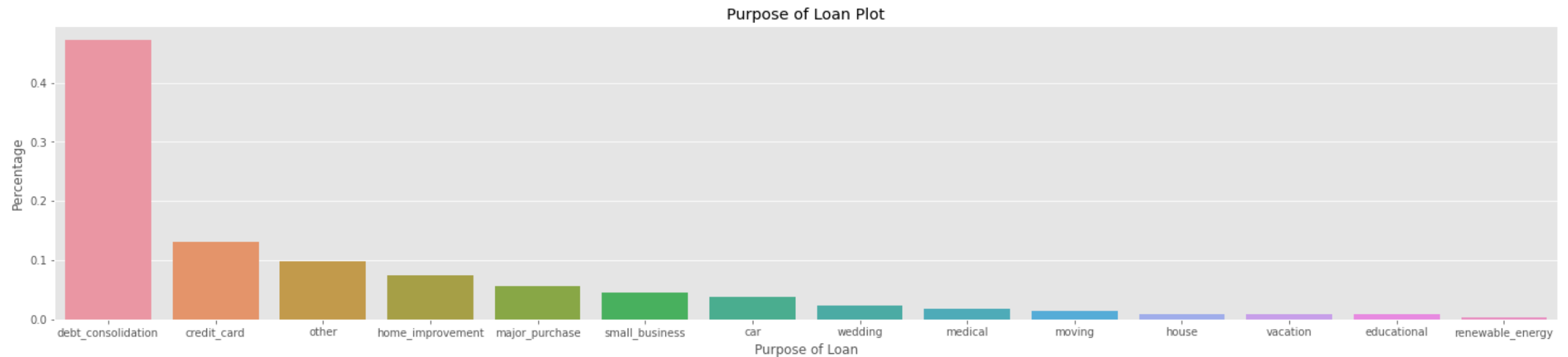
Analyse the given loan data of Lending Club to understand the driving factors behind loan default, i.e. the variables which are strong indicators of default. Default of a loan means failure to repay a loan according to the agreed terms.

The company can utilise this knowledge for its portfolio and risk assessment. The aim is to identify patterns which indicate if a person is likely to default, which may be used for taking actions such as denying the loan, reducing the amount of loan, lending (to risky applicants) at a higher interest rate, etc.

Solution approach :

- Perform a high-level analysis of the loan data sheet to get an overview of the data description of columns provided, deduce the columns that might be prominent to loan attributes like Loan Interest rate, Loan term, Borrowers Credit etc.
- Load data and view the data structures, data types, date formats, total number of records/columns etc.
- Clean the data for Null values , Uniques values, drop unnecessary columns, Unwanted spaces/symbols in column values etc.
- Reformat Date columns to aid the analysis.
- Derive additional columns to aid our analysis .
- Perform EDA(Exploratory data analysis) methods like Univariate/Segmented Univariate and Bivariate analysis using plots to deduce the patterns and insights of why borrowers default on loans.
- Use these data insights to arrive at the conclusion of borrows defaulting on a loan. Recommend preventive measures to Lending Club to mitigate this loan default risk.

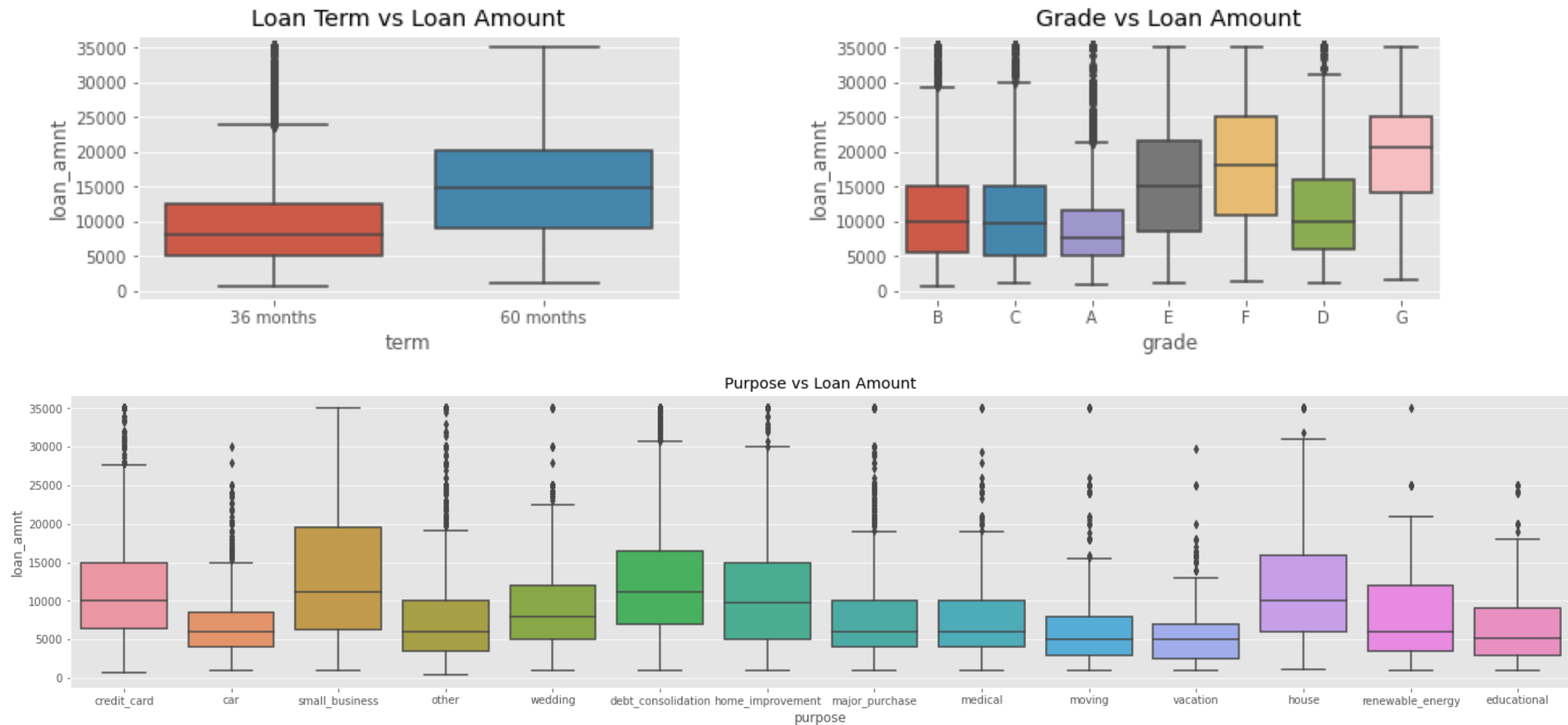
Data Analysis : Generic



Insights from the plots above:

- Borrowers mostly got the loan for consolidating their debts.
- Most of the Loans issued by Lending club are Not-Verified which means not all details of the borrowers documentation is not verified.
- Most of the borrowers have Rental and Mortgage home ownership, very few with own houses got loans.

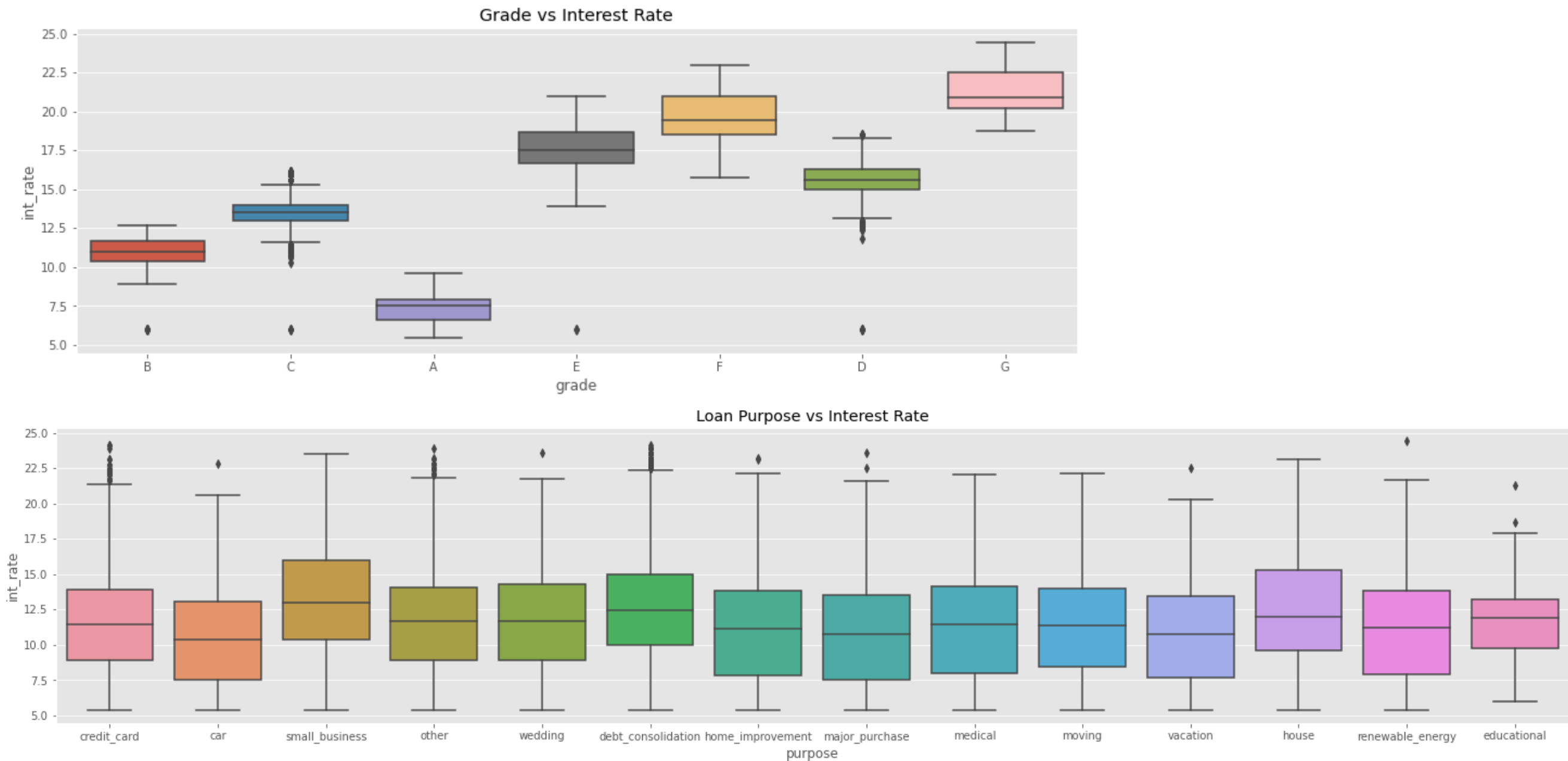
Data Analysis : Loan amount aspect



Insights from the plots above:

- Loan term of 60 Months have average loan amount of \$15K and maximum loan amount issued.
- Grade G, E, F has more Loan amount issued, this is more risk since low grade loan have borrowers with low credit history and low repayment capacity
- Small Business loan purpose is having high loan amount issued

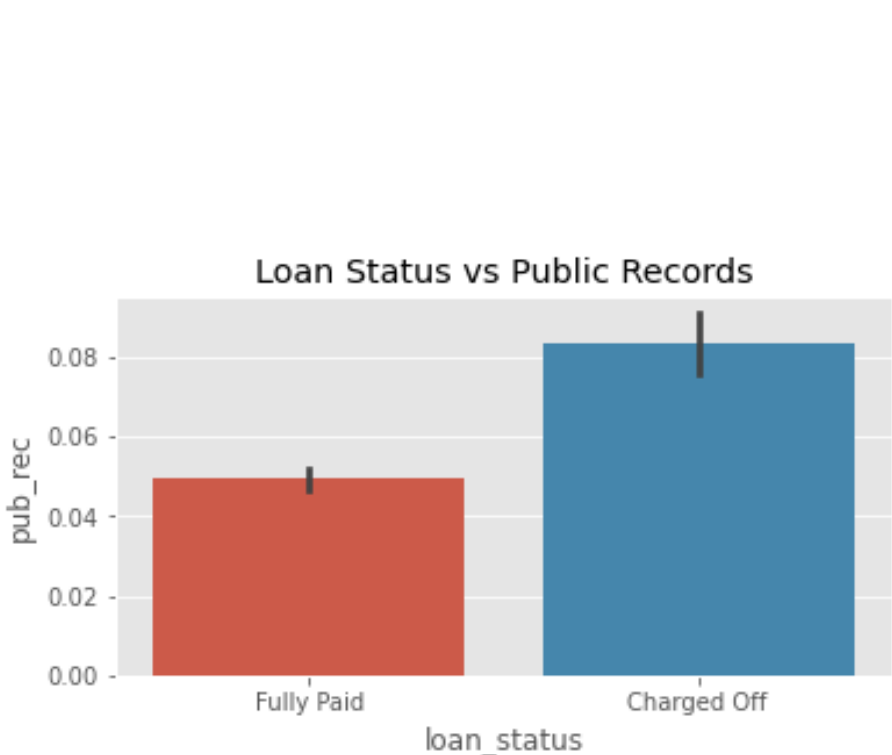
Data Analysis : Loan Interest rate aspect



Insights from the plots above:

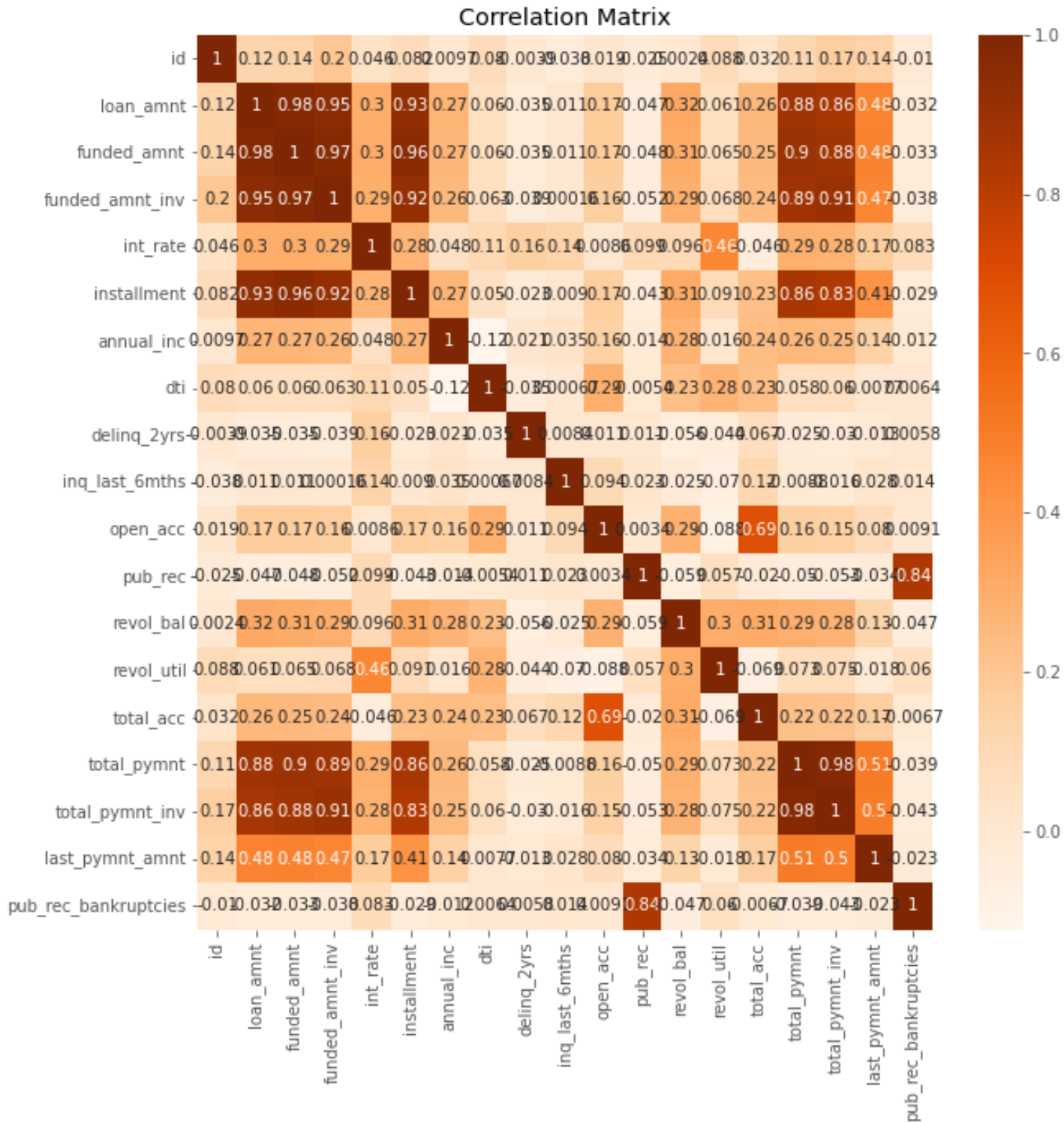
- Lesser Loan grades have higher interest rate.
- Most of the borrowers with loans for Small Business have high Interest rates

Data Analysis : Public records aspect

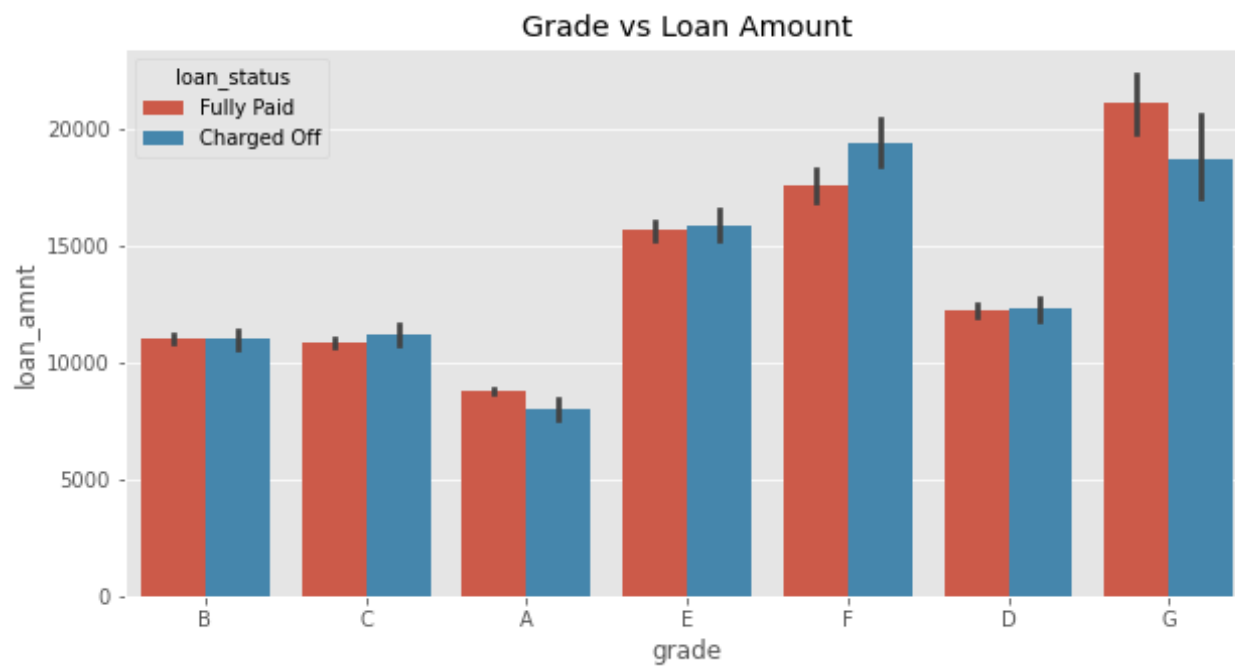
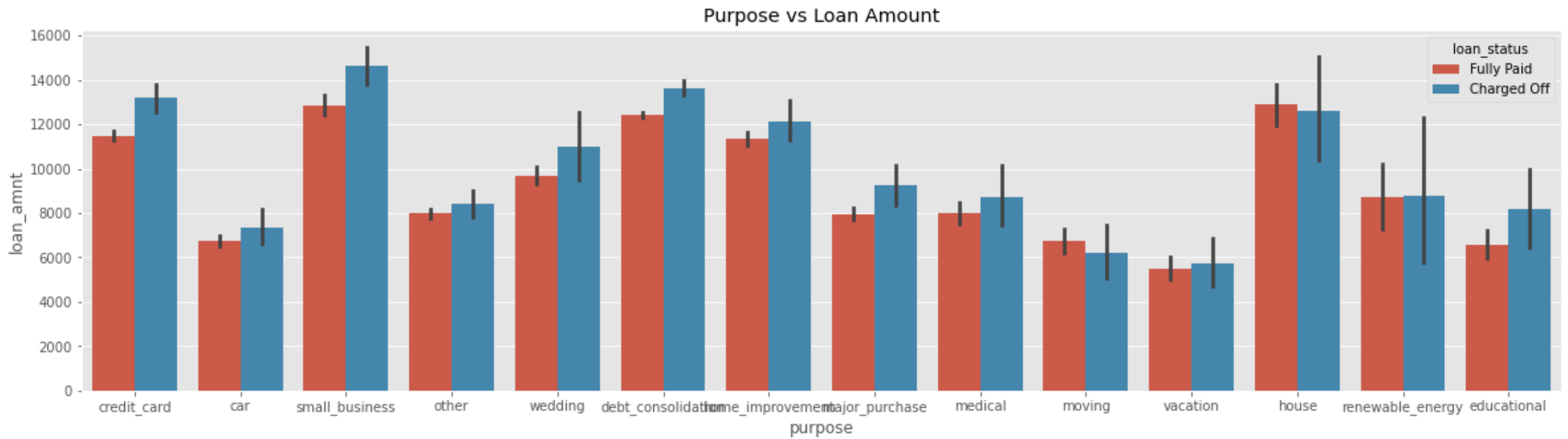


Insights from the plots above:

- Borrowers who have public records are more likely to get defaulted.
- Public Records is highly correlated with bankruptcies (See Pub_rec vs Pub_rec_bankruptcies in the Heat map above).



Data Analysis : Loan status aspect



Insights from the plots above:

- Lesser Loan grades have higher interest rate.
- Most of the borrowers with loans for Small Business have high loan amount.

Conclusion:

Loan Grade:

- Low grade loans G, E, F have loans issued with higher loan amount and higher interest rate, there is more risk involved with low grade loans where borrowers who generally have low credit history and low repayment capacity.

Recommendation: Lending Club can minimise the disbursement of low grade loans.

Loan Purpose:

- Loans issued for Small Business purpose have higher loan amount and higher interest rates, there is a definite risk of default for this purpose.

Recommendation: Lending Club can minimise the disbursement of loans for Small business purpose and add additional verification process to mitigate the default risk.

Public Record:

- Borrowers with public records have defaulted on the payments to some financial intuitions earlier and also likely to go bankrupt.

Recommendation: Lending Club can avoid issuing loans to applicants who have Public records in their credit history.