# LENDING CLUB CASE STUDY

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# ABSTRACT


- Lending Club is a consumer finance company which specialises in lending various types of loans to urban customers. When the company receives a loan application, it makes a decision for loan approval based on the applicant's profile.

- The goal of this analysis 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 risks applicants) at a higher interest rate etc…,

- 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.

# PROCESS FLOW

Data Load → Data Cleaning → Univariate Analysis → Bivariate Analysis → Conclusion

**Data Load**

- Load Loans Dataset

**Data Cleaning**

- Dropping unwanted attributes
- Syncing and altering the DataTypes of the attributes
- Case conversion of categorical attributes
- Removing unwanted values from attributes
- Handling Missing Values
- Outlier Detection
- Deriving attributes from the current attributes
- Binning continuous attributes

**Univariate Analysis**

- Analysing continuous data
- Analysing discrete data
- Understanding categorical data
- Plotting distributions of numeric data to understand the characteristics
- Understanding the frequencies of categorical data

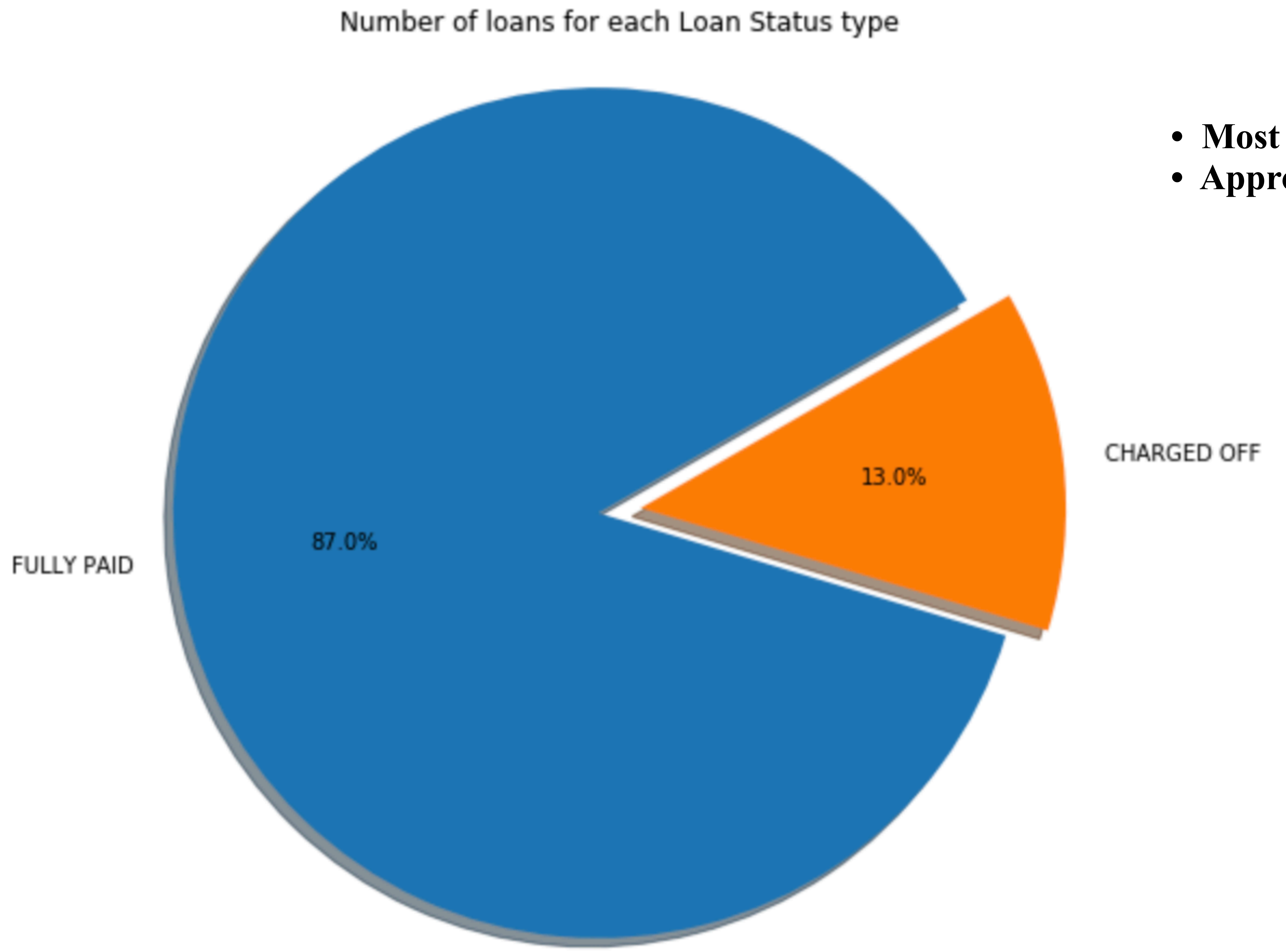
**Bivariate Analysis**

- Analysing the behaviour of attributes combined with the loan status
- Grouping and plotting variables to find default rate pattern
- Finding correlation between numerical attributes

**Conclusion**

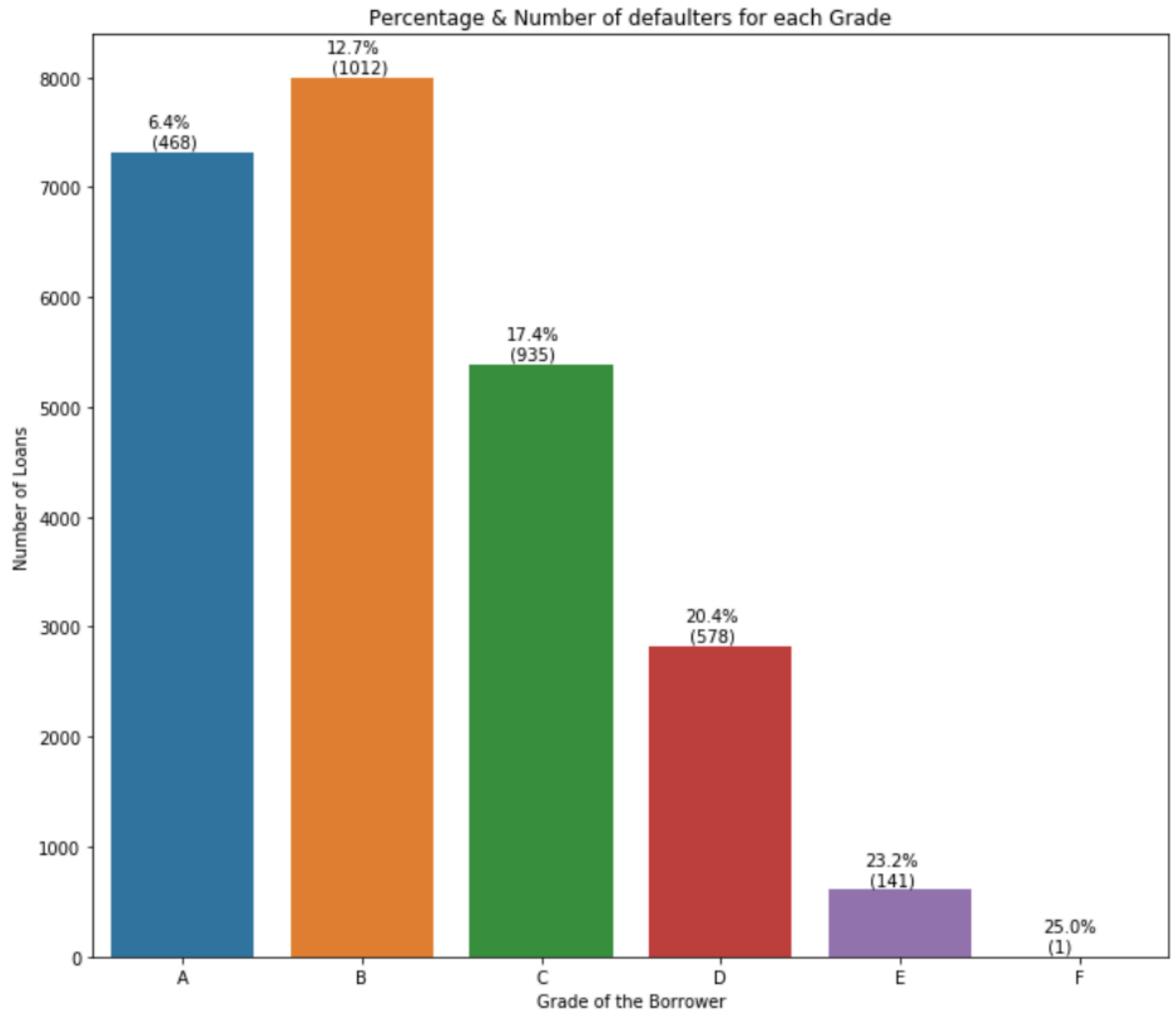
- Deriving top attributes which drive the default rate to take better actions for such loan applications

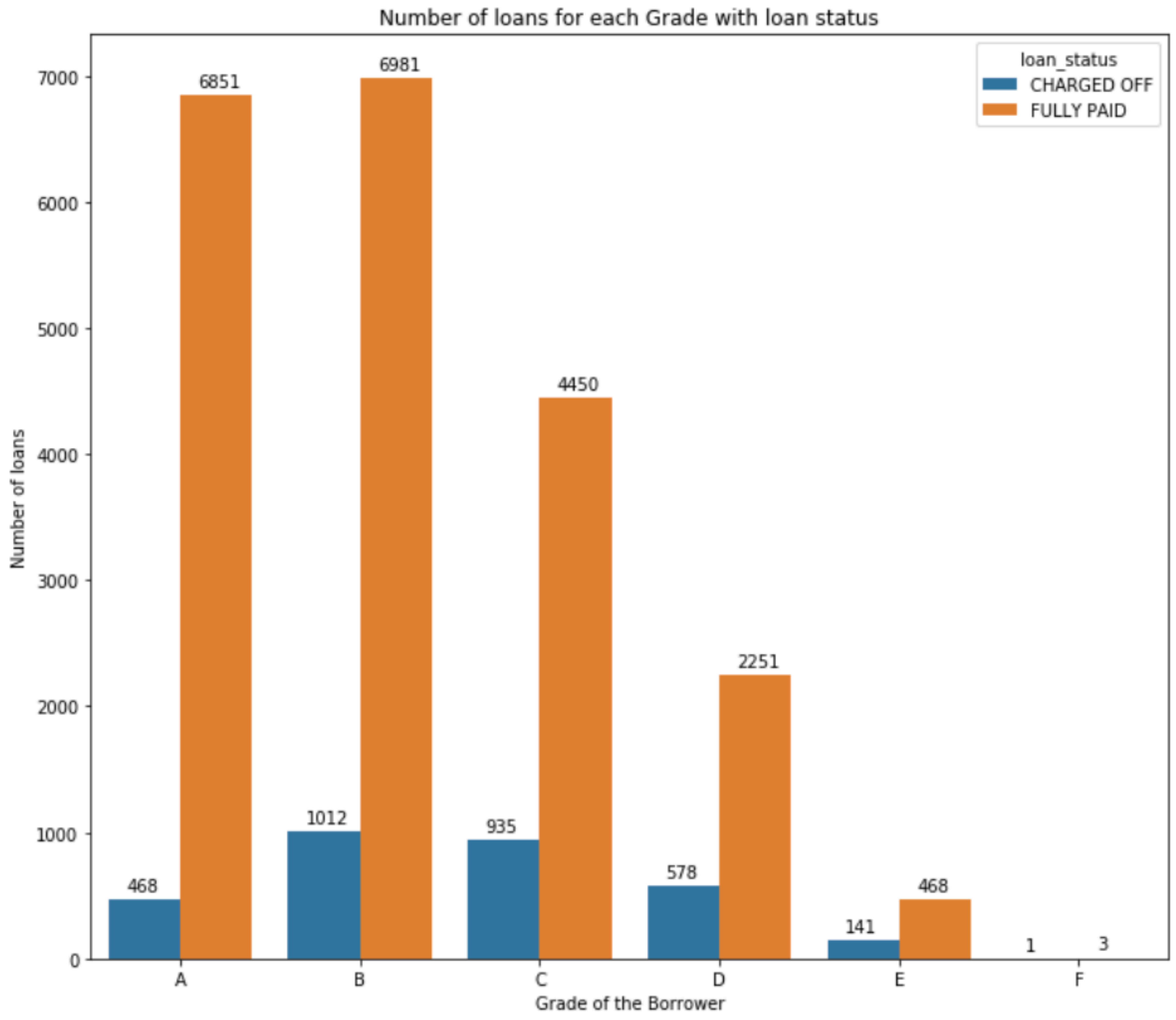
# ANALYSIS




- **Most of the borrowers have fully paid their loans**
- **Approximately 13% of the total borrowers are defaulters**

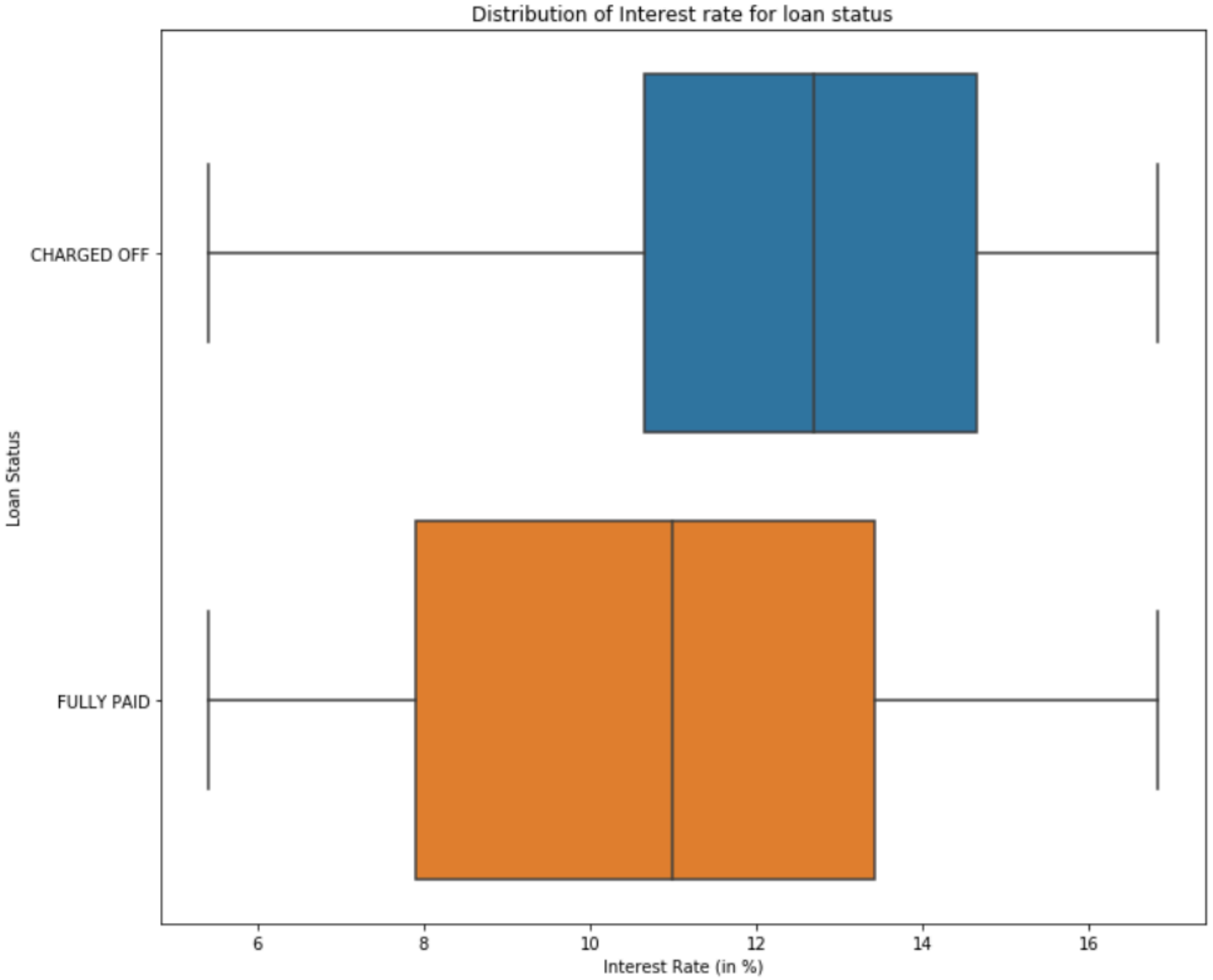
# GRADE OF THE BORROWER:

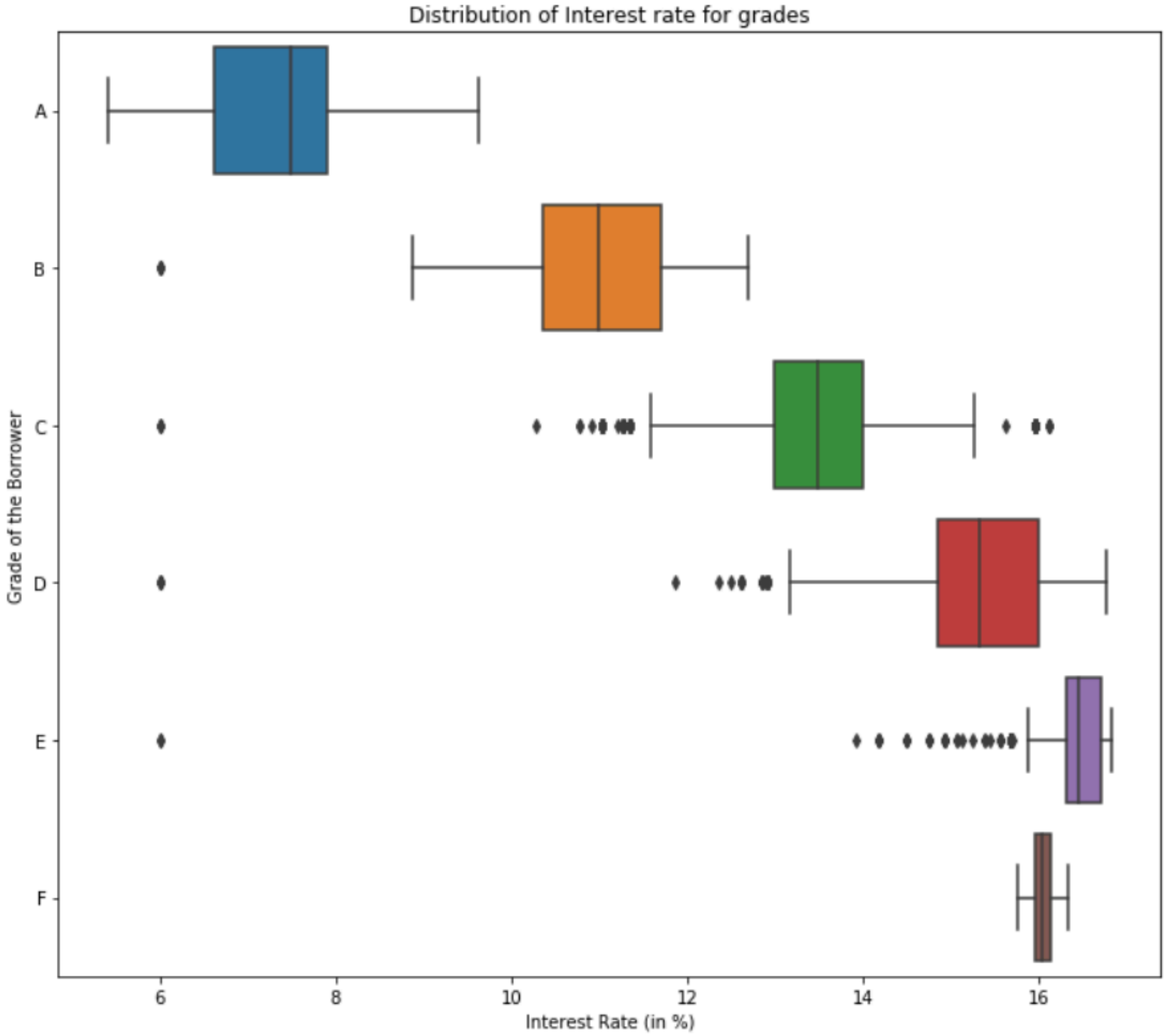



**If a borrower has a grade other than 'A' or 'B' is more likely to tend to default the loan**

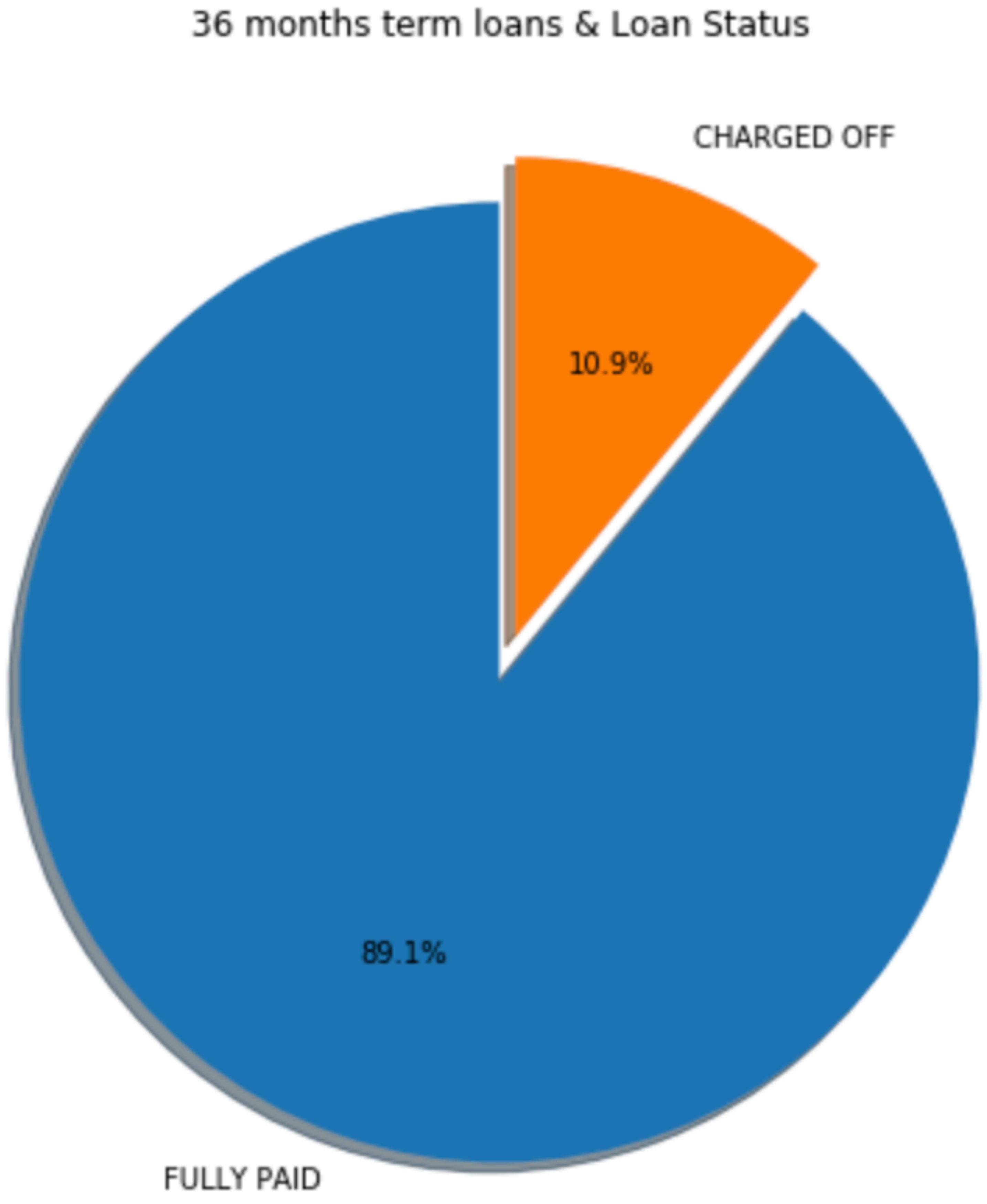
# INTEREST RATE:

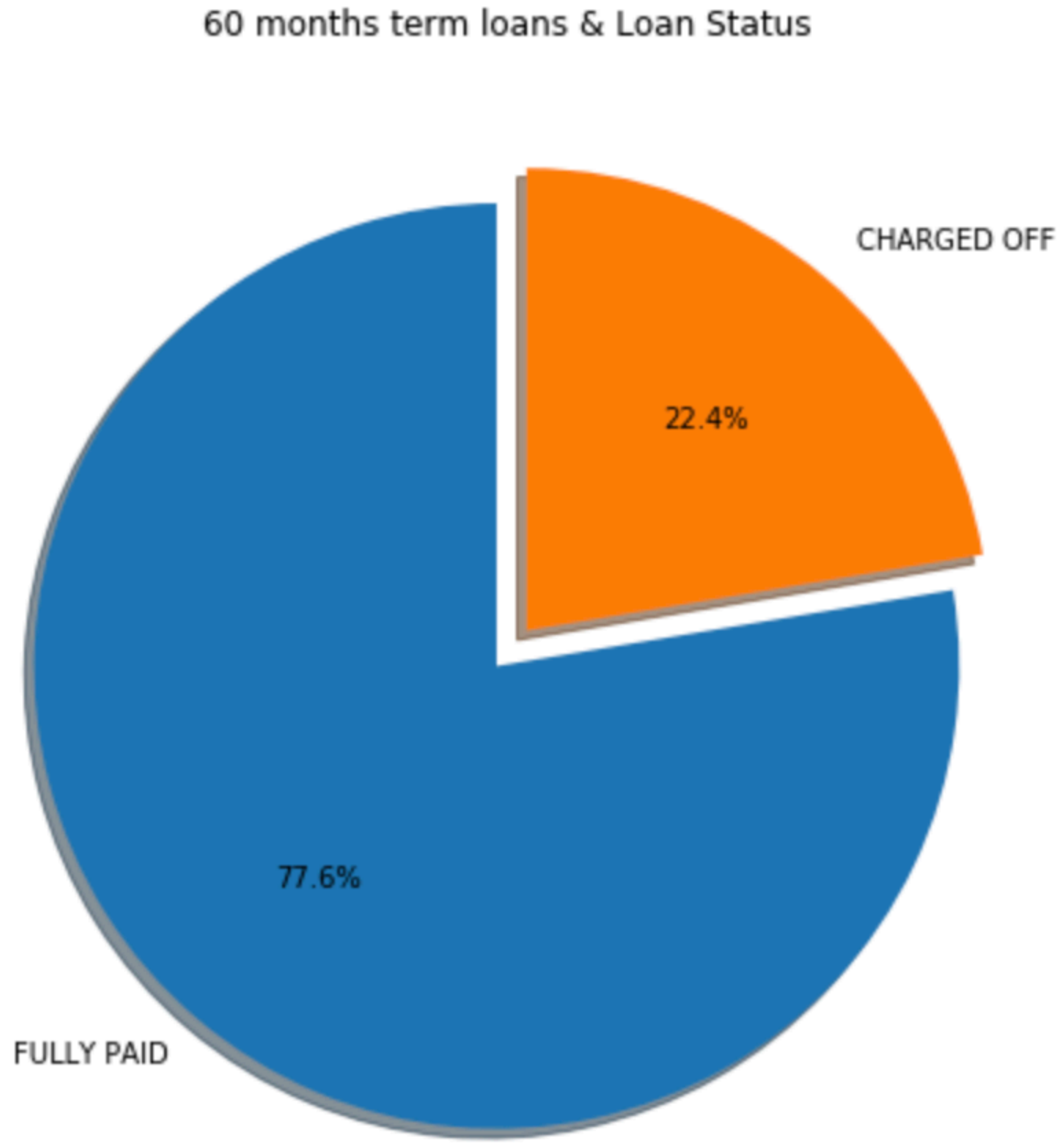



- **For loans with higher interest rate are more prone to default**
- **And as we observe the distribution in Grades, for Grade-A borrowers, the interest rate is less compared to the other grades**
- **From the above analysis, we can say that Grade-A borrowers are more likely to pay the loan fully**

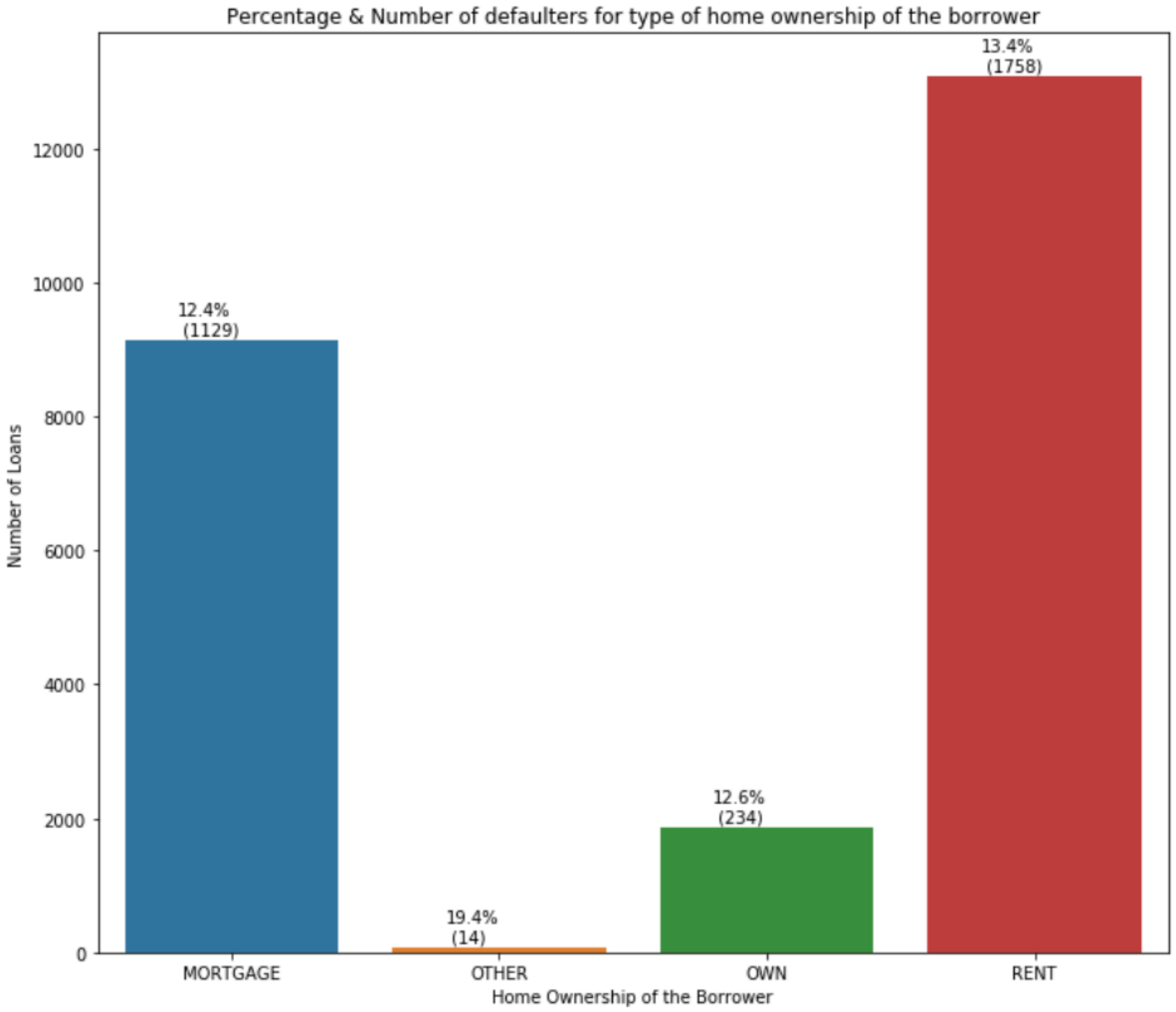
# LOAN TENURE/TERM:

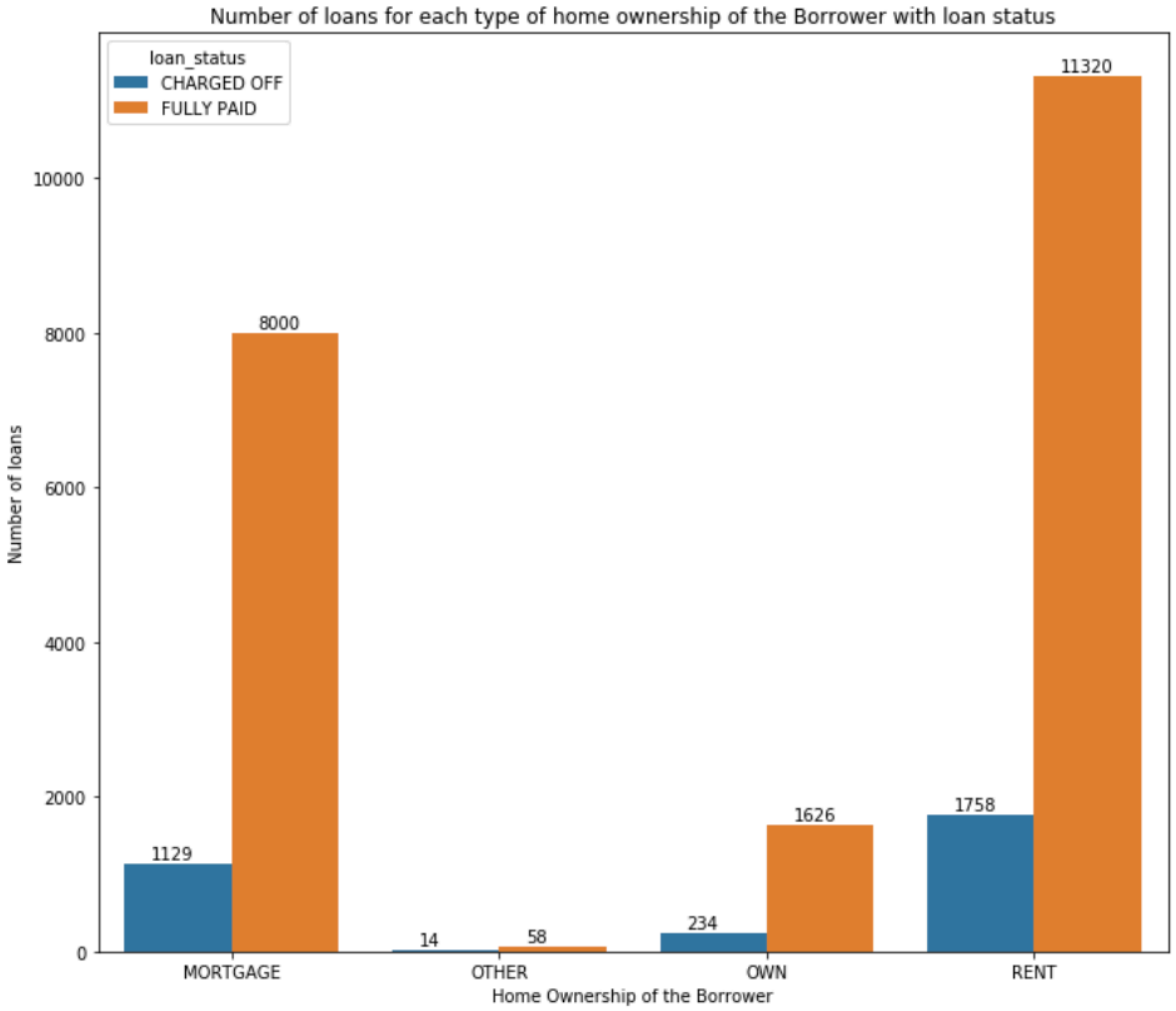



**Loans approved for 60 months have a greater percentage (22.4%) approximately double to the loans approved for 36 months to default**

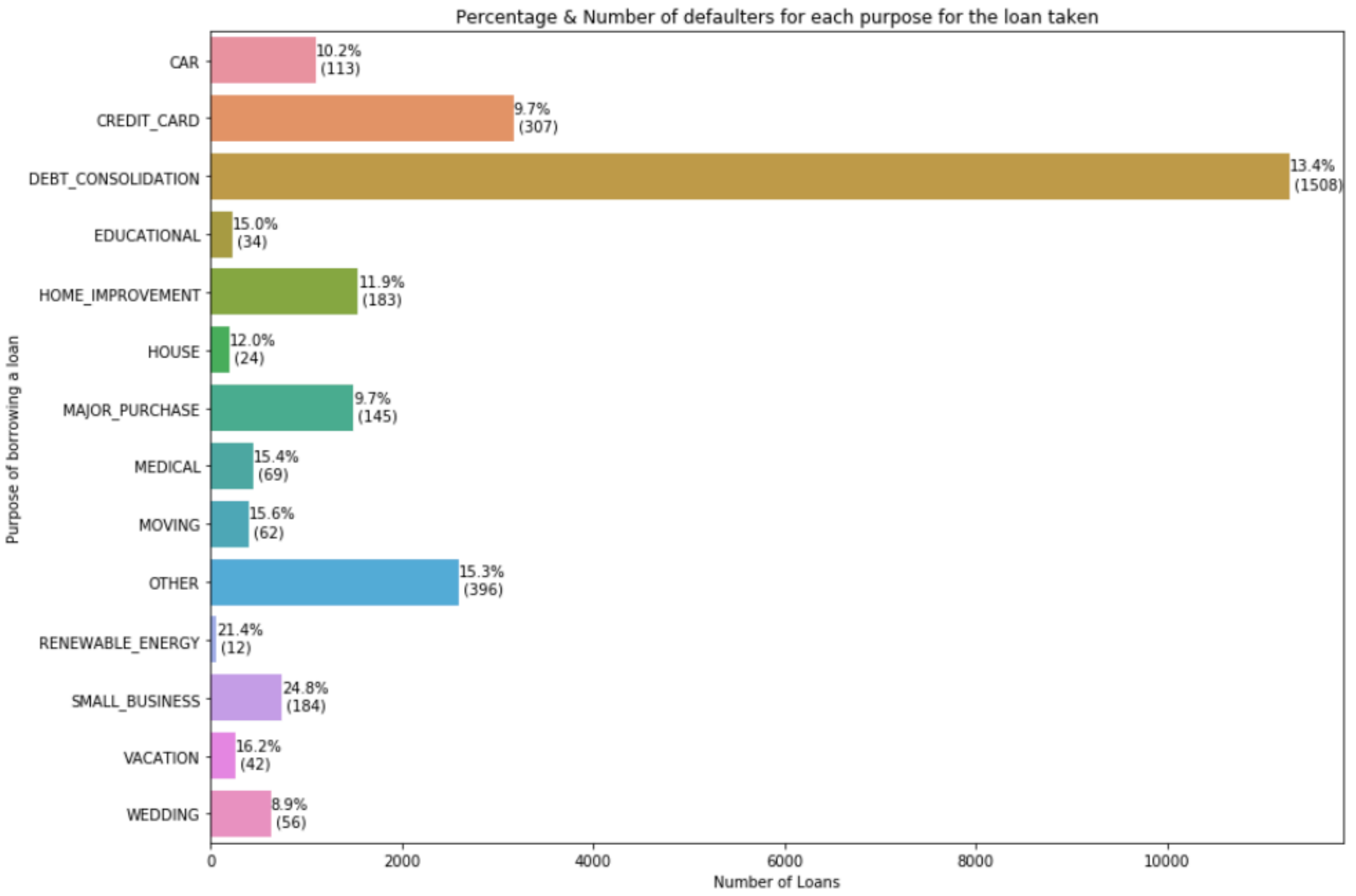
# BORROWER’S HOME OWNERSHIP:

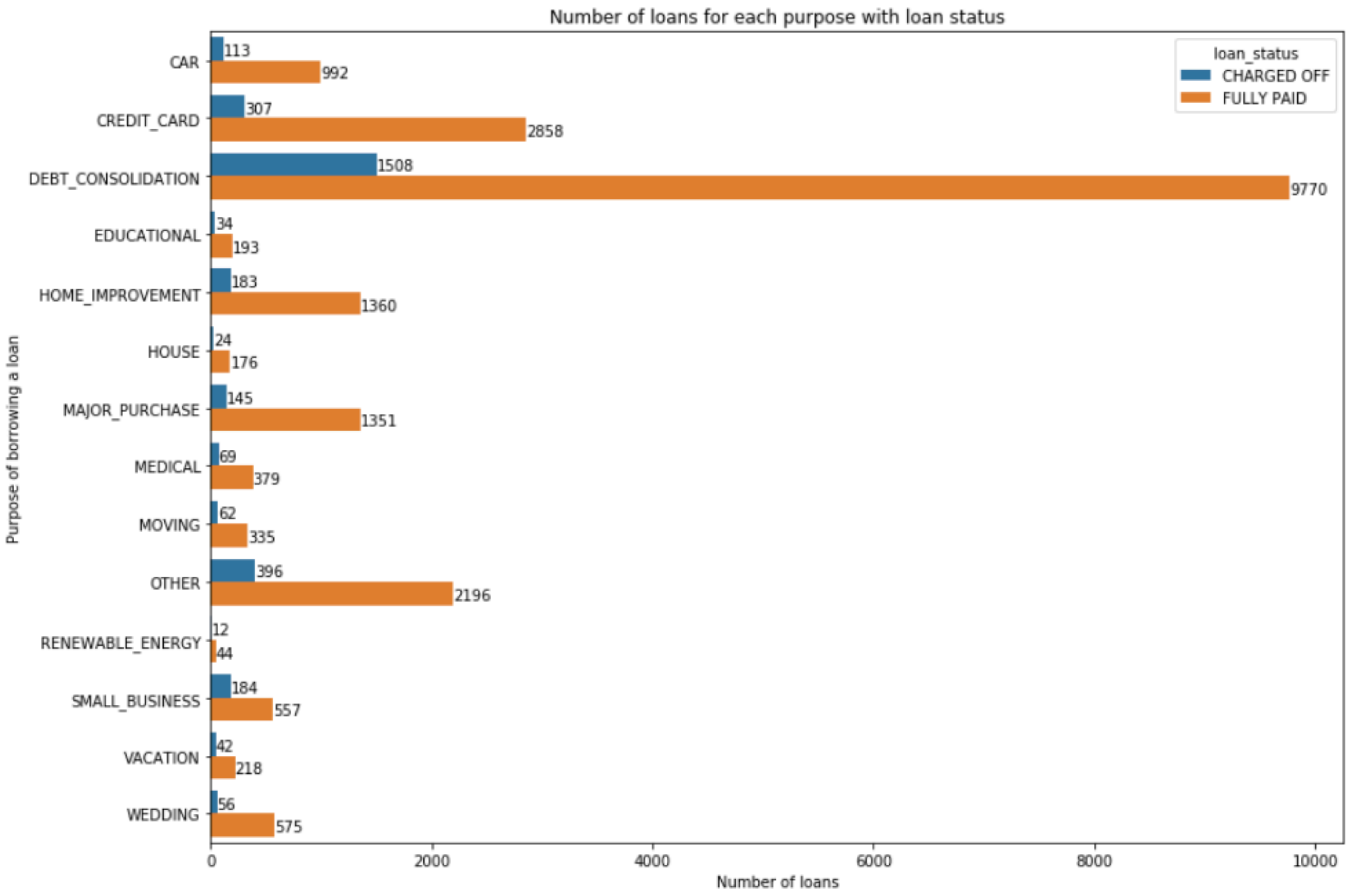



- **Borrowers who don't own a house are more likely to default**
- **They might be having other loans for mortgage or rent due to which they are unable to fully pay the loan**

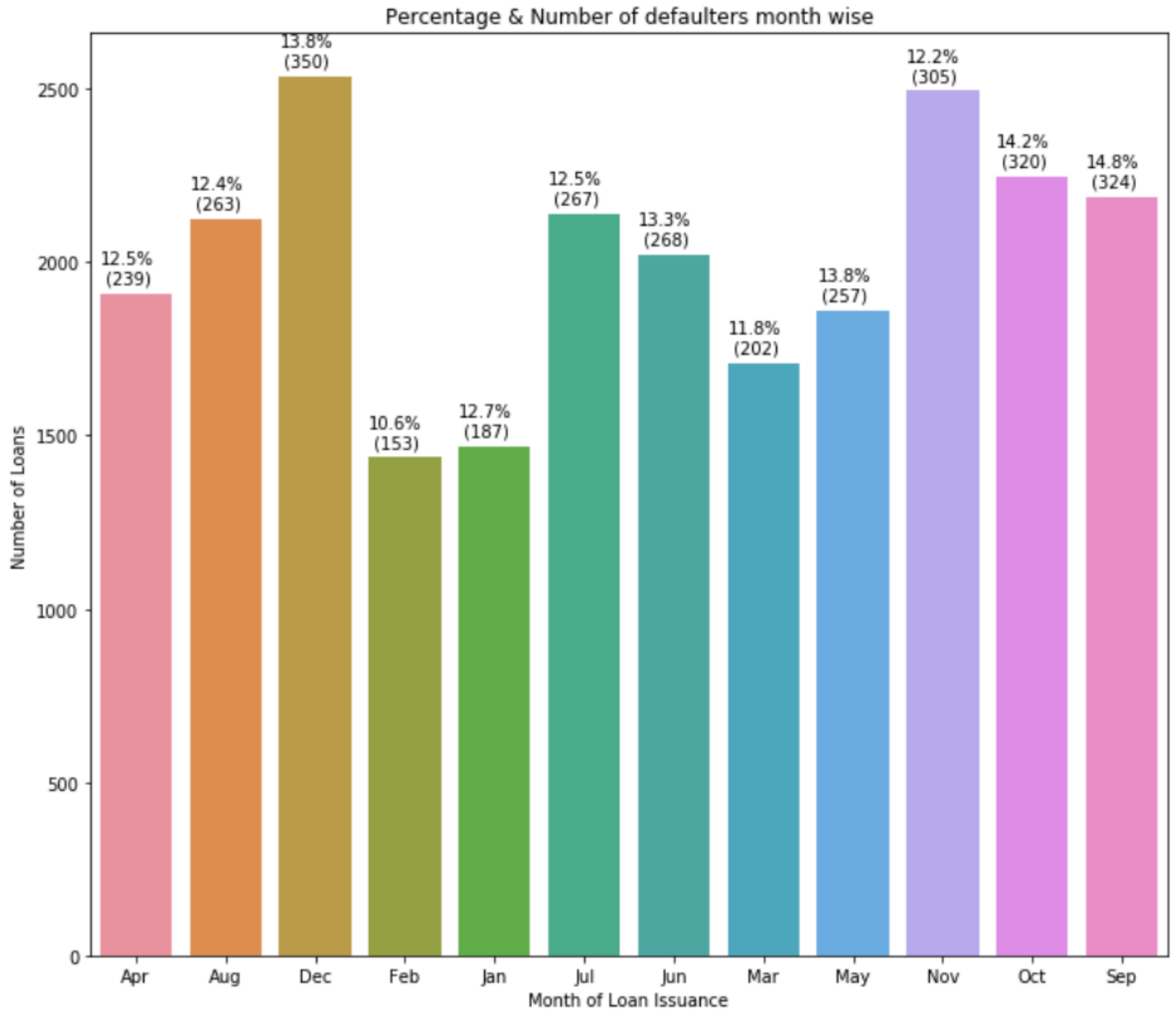
# PURPOSE OF BORROWING A LOAN:

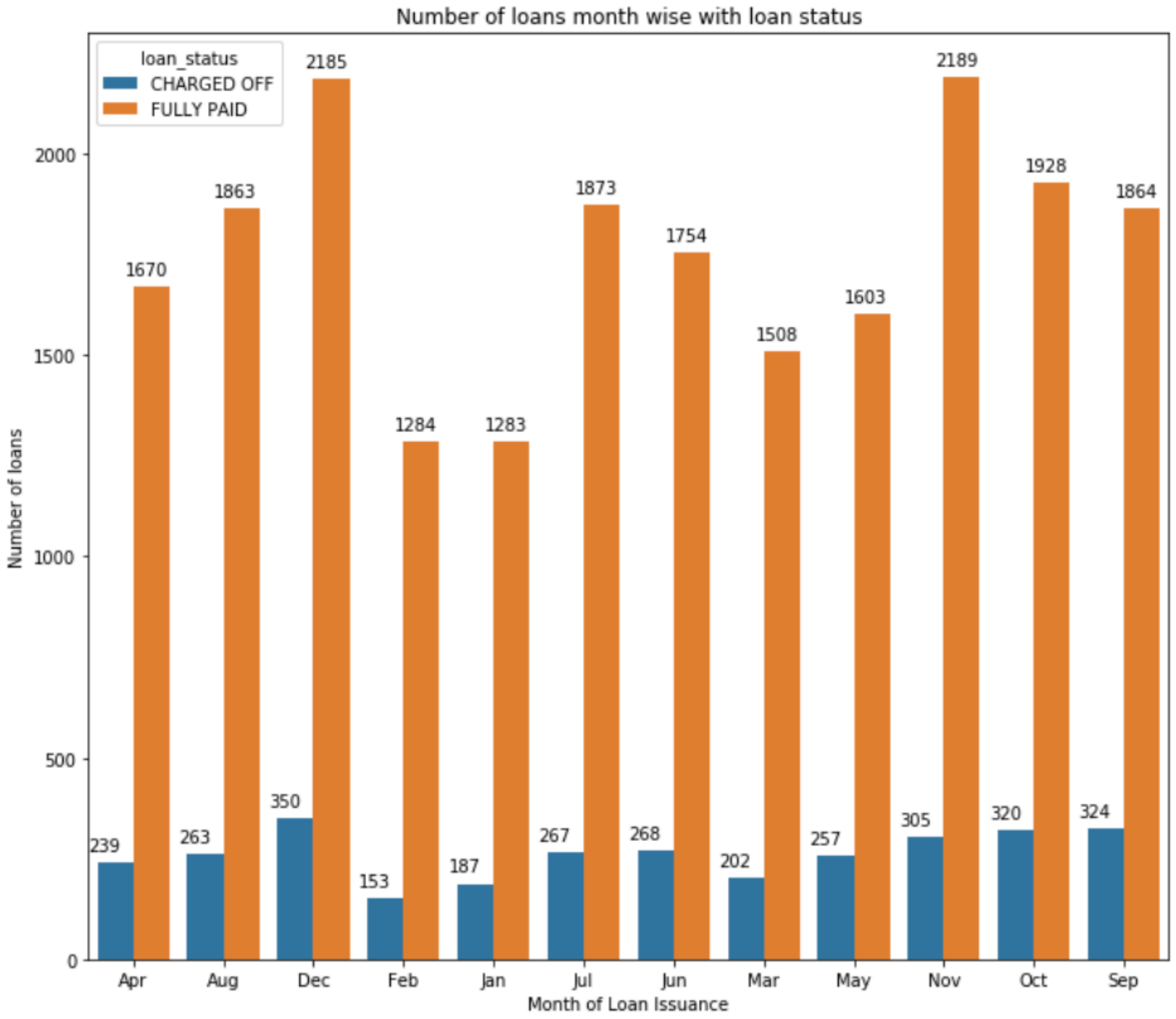



- **Small Business, Renewable energy, Vacation are the top three purposes where the loans are more likely to be defaulted**

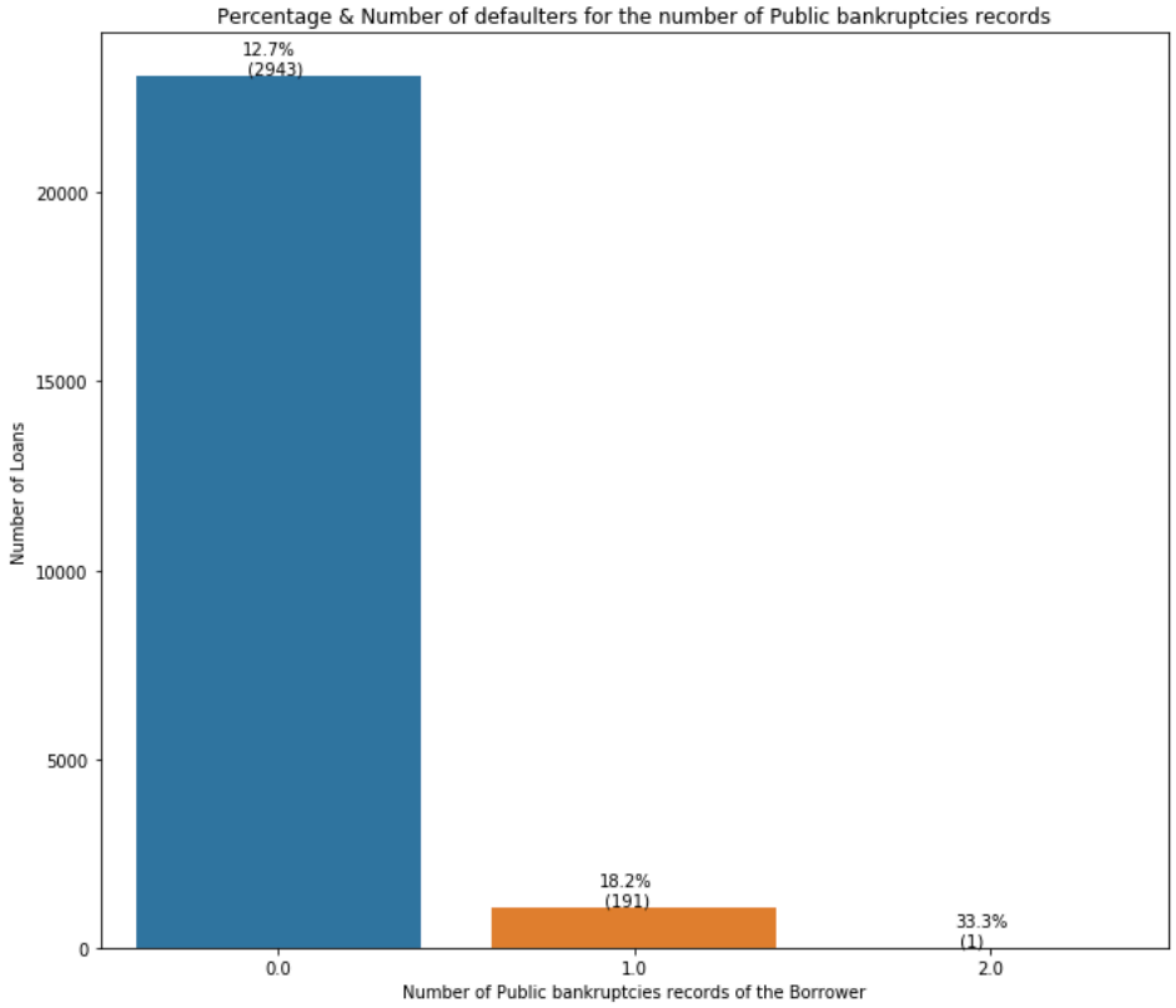
# MONTH OF LOAN ISSUANCE:

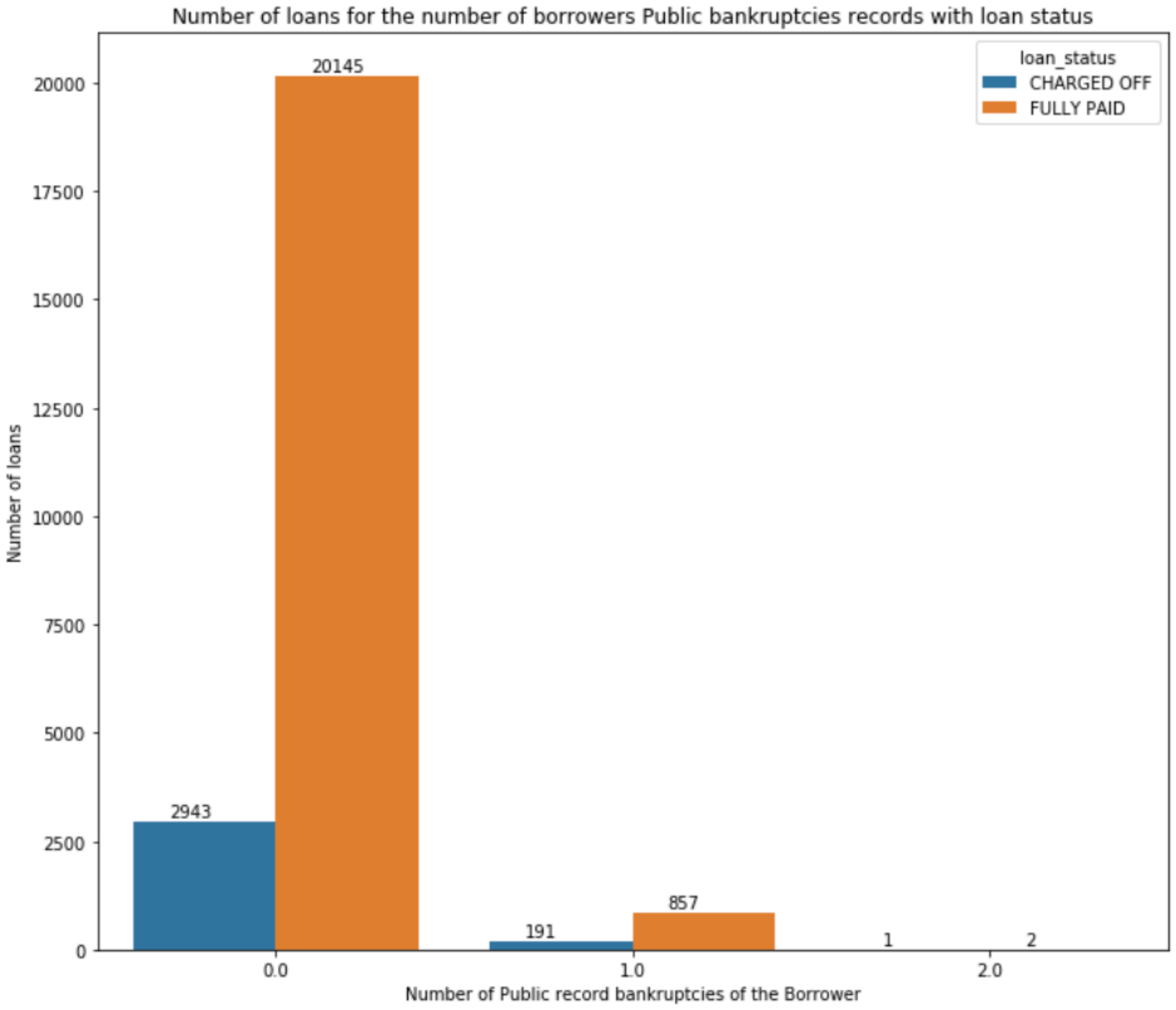



- **We can observe that the percentage of defaulters is less for the starting months of the year and went increasing to the end of year**
- **The loans issued in the ending months of the year are more likely to be defaulted**

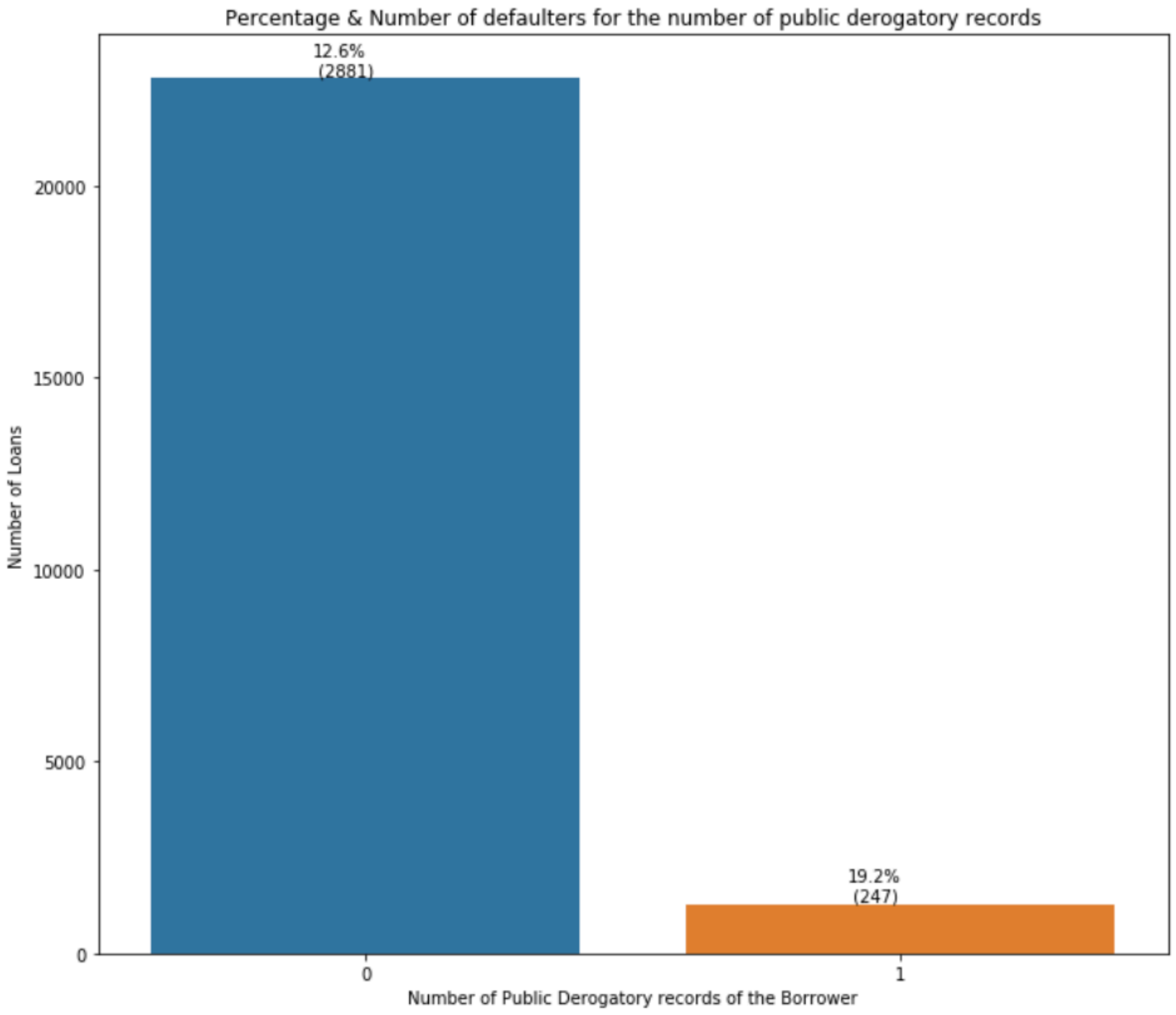
# PUBLIC BANKRUPTCIES RECORD OF THE BORROWER:

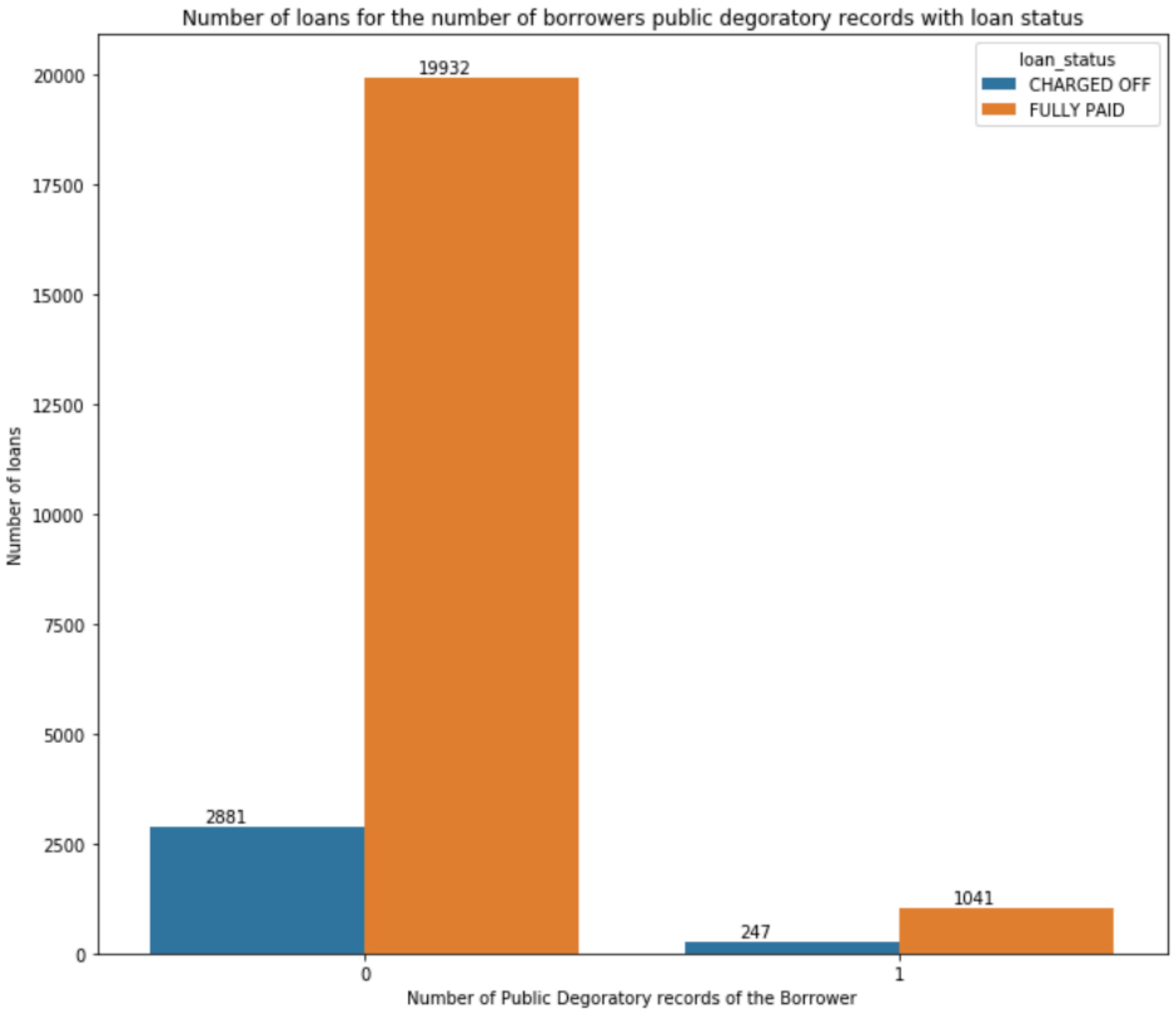



**More number of public bankruptcies records, the borrower is more likely to default the loan**

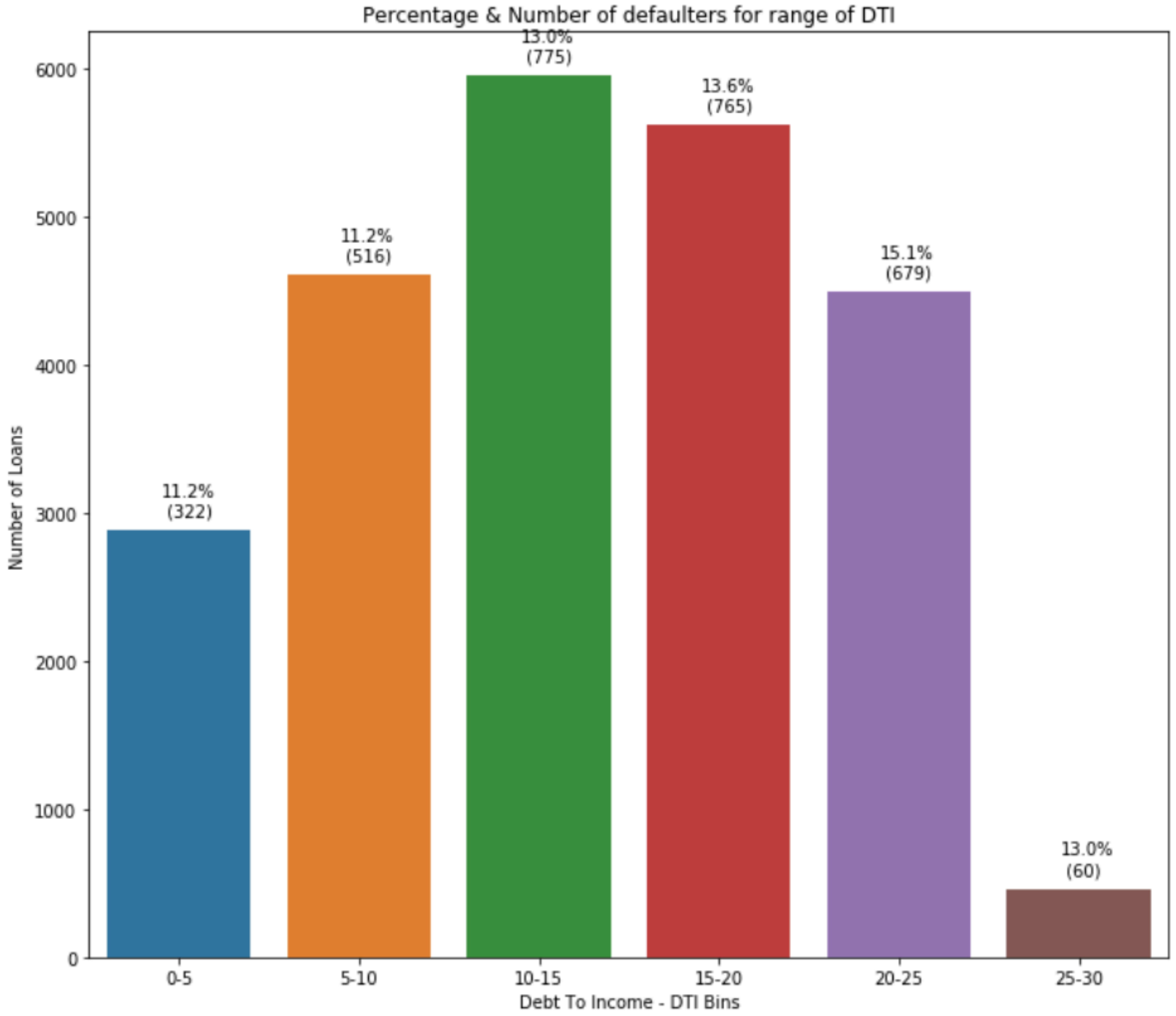
# PUBLIC DEROGATORY RECORD OF THE BORROWER:

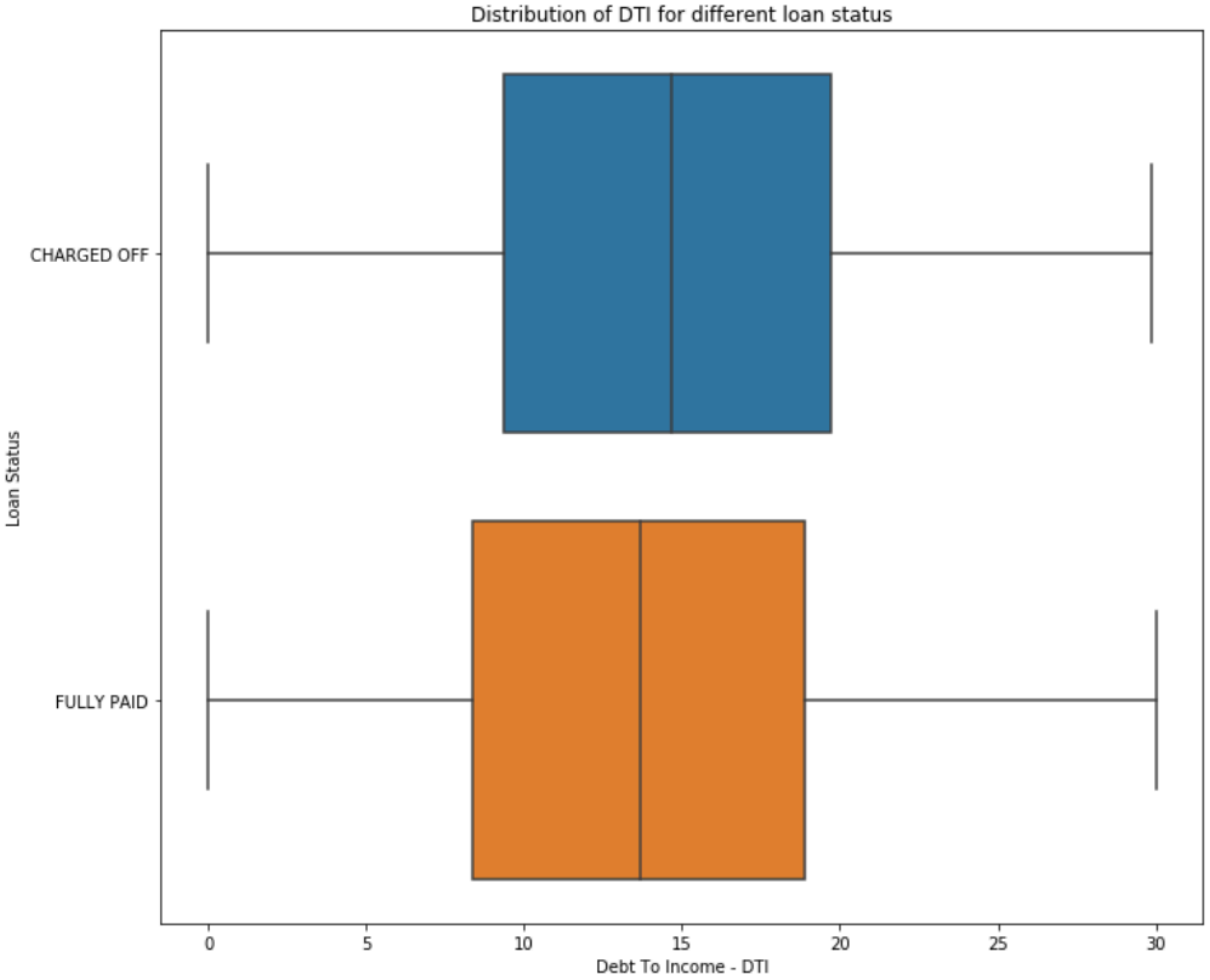



**More number of public derogatory records, the borrower is more likely to default the loan**

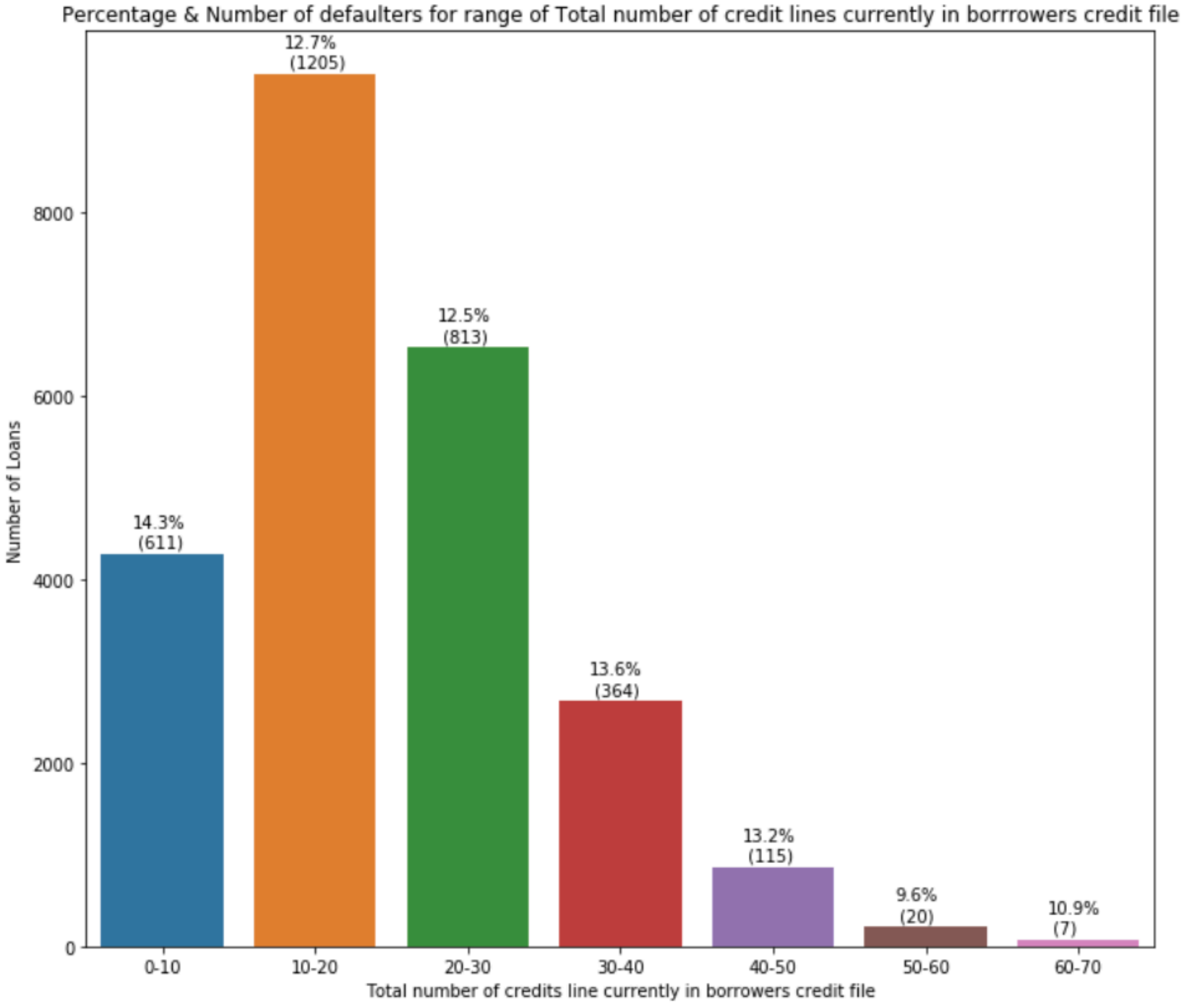
# DEBT TO INCOME (DTI):

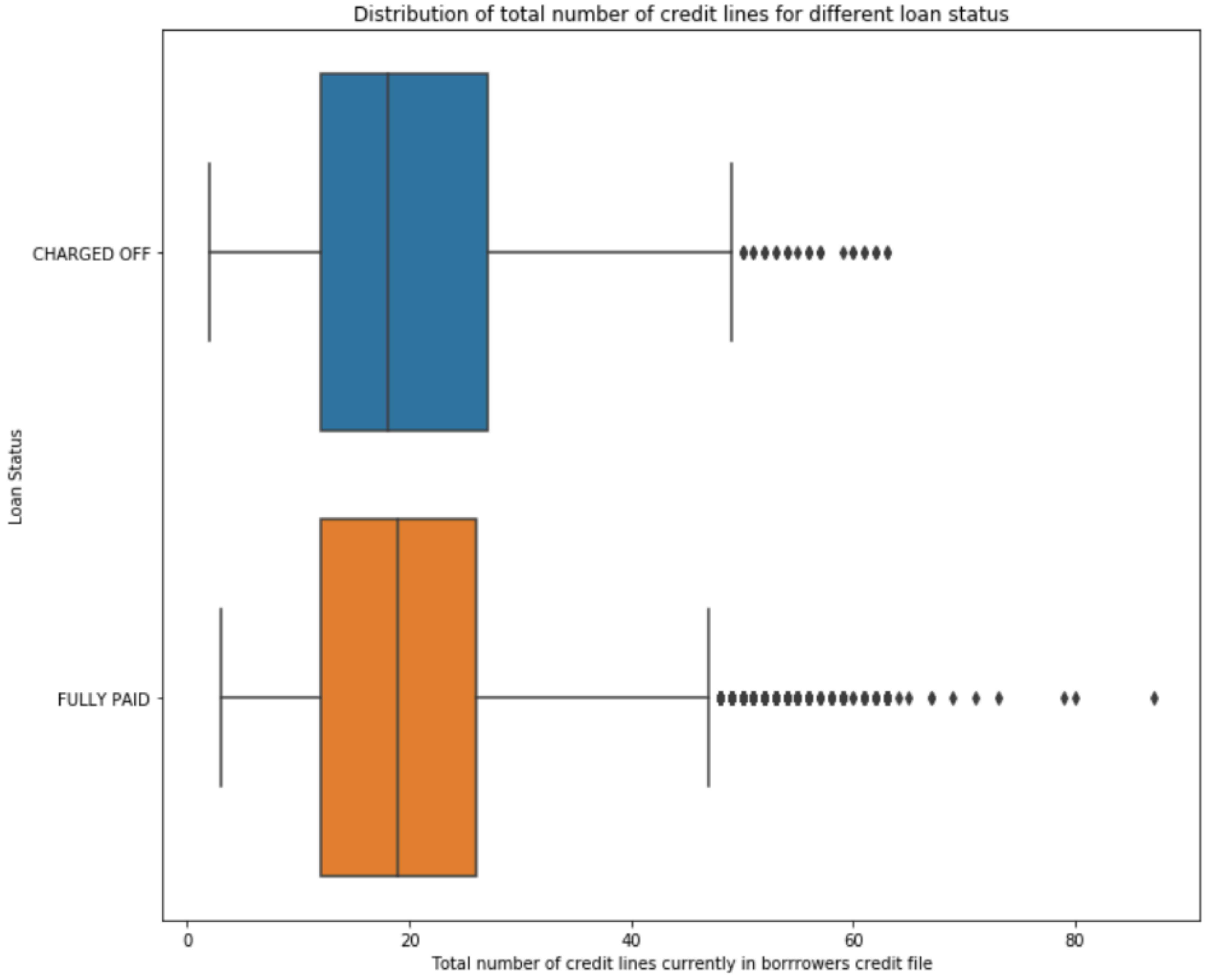



- **DTI is the derived metric from annual income. DTI is directly proportional to probability of loan defaulting**
- **The higher value of DTI, higher are the chances of Loan defaulting**

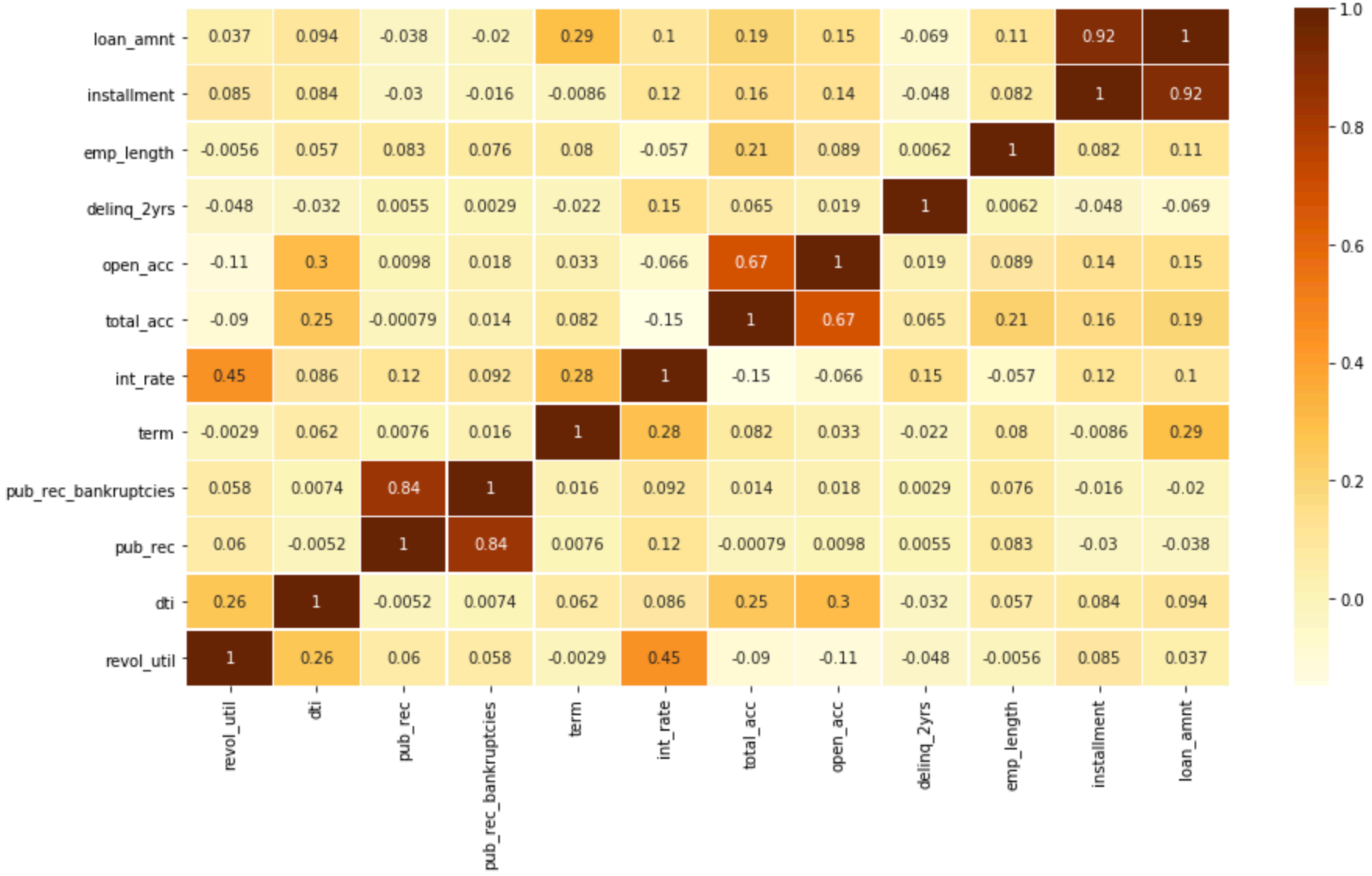
# REVOLVING LINE UTILIZATION RATE:




- **A good revolving line utilization rate is less than 30-40.**
- **We can also observe that the percentage of defaulters are increasing with the increase of revolving utilization.**

# CORRELATION BETWEEN CONSUMER AND LOAN ATTRIBUTES:




- Public derogatory records & Public records of bankruptcies, Total number of credit lines & Open credit lines, Loan amount & Instalment amount are highly positively correlated, which is highly relatable
- Interest Rate & Revolving Line utilization rate are fairly positively correlated. As the Interest Rate increased for more defaulters, the revolving line utilization rate also increases
- Interest Rate & Total number of credit lines are highly negatively correlated

# CONCLUSION:

## Below are some of the observations made on the attributes which drive the loan defaulting:

- **GRADE OF THE BORROWER** : If the borrower has a lesser grade **(i.e, less than B grade - C, D, E, F)** is more likely to be a defaulter.
- **INTEREST RATE** : Loans with higher interest rate **(greater than ~ 11-12%)** are more likely to be defaulted.
- **LOAN TERM/TENURE** : **60 months** tenure loans are highly to be defaulted.
- **DEBT TO INCOME** : The higher value of DTI **(> 10)**, higher are the chances of Loan defaulting.
- **REVOLVING LINE UTLIZATION RATE** : Borrowers with high Revolving line utilization rate **(> 30)** are more likely to be defaulters.
- **LOAN ISSUING MONTH** : Loans issued at the ending months of the year **(generally post August)** have higher chances to be defaulted.
- **PUBLIC DEROGATORY RECORDS** : Borrowers with high number of public derogatory records **(More than 1)** are more likely to be defaulters.
- **PUBLIC RECORDS OF BANKRUPTCIES** : Borrowers with high number of public records of bankruptcies **(More than 1)** are more likely to be defaulters.
- **LOAN PURPOSE** : Loans borrowed for **'Small Business, Renewable energy, Vacation'** purpose might turn out to be defaulted.
- **BORROWER HOME OWNERSHIP** : Borrower's who **do not own a house** will most likely turn out to be defaulters.