# LENDING CLUB CASE STUDY

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# PROBLEM STATEMENT

- Given a dataset from a large online loan marketplace where people can avail loans easily. It contains data about customers who are currently paying their loan, customers who already paid their loans and the ones who defaulted on their loan. It also contains information about consumer and loan attributes.

- The company wants us to find the drivers to identify risky loans (loans which are likely to be defaulted)

# DATASET UNDERSTANDING AND SUMMARY

- Given dataset has a lot of consumer and loan attributes related information

- It carries a lot of information which could be helpful to identify risky loans from new loan applications , like
    - ✓ interest rate
    - ✓ lending club assigned loan grades and loan sub grades
    - ✓ Duration of loan
    - ✓ Purpose of the loan
    - ✓ Title assigned to the loan by borrowers
    - ✓ Borrowers' address – particularly state
    - ✓ Loan issued month
    - ✓ Debt to income ratio and many more

# DATASET UNDERSTANDING AND SUMMARY CONTINUED

- It also carried information which couldn't be used to analyse risk drivers since this information won't be available for new loan applications
  - Borrowers' delinquency information
  - The last payment amount, last payment date, next payment date
  - Principal and interest breakdown of the loan
  - Hard inquiries, credit revolving balance, revolving credit utilization
  - Count of open credit lines, recovered amount
  - And many more

# LOAN BREAK UP INTO DEFAULT, RUNNING AND NON DEFAULT

Current loan was not taken into account during analysis.



Distribution of loan status

- Fully Paid — 83.0%
- Charged Off — 14.2%
- Current — 2.9%
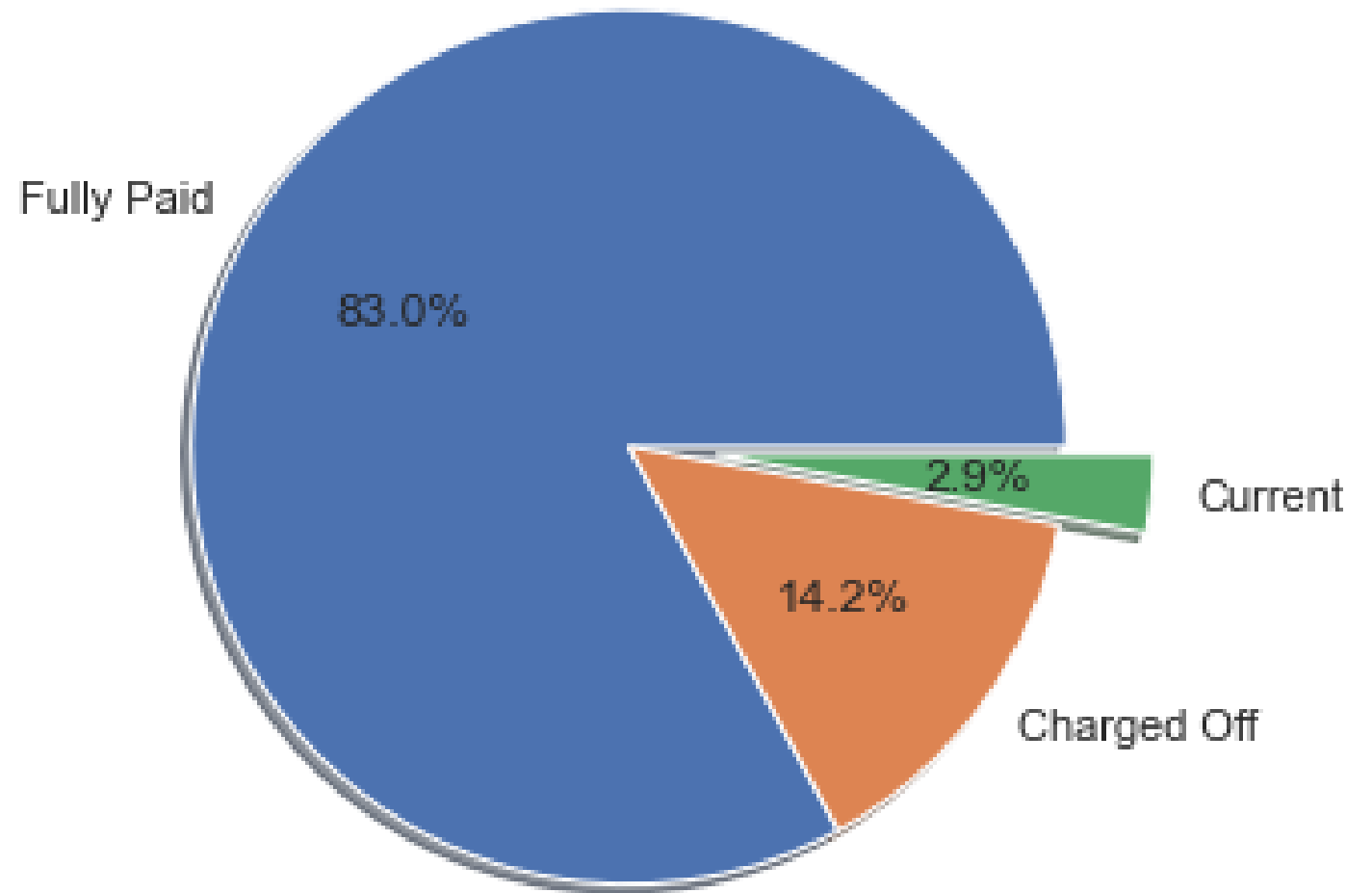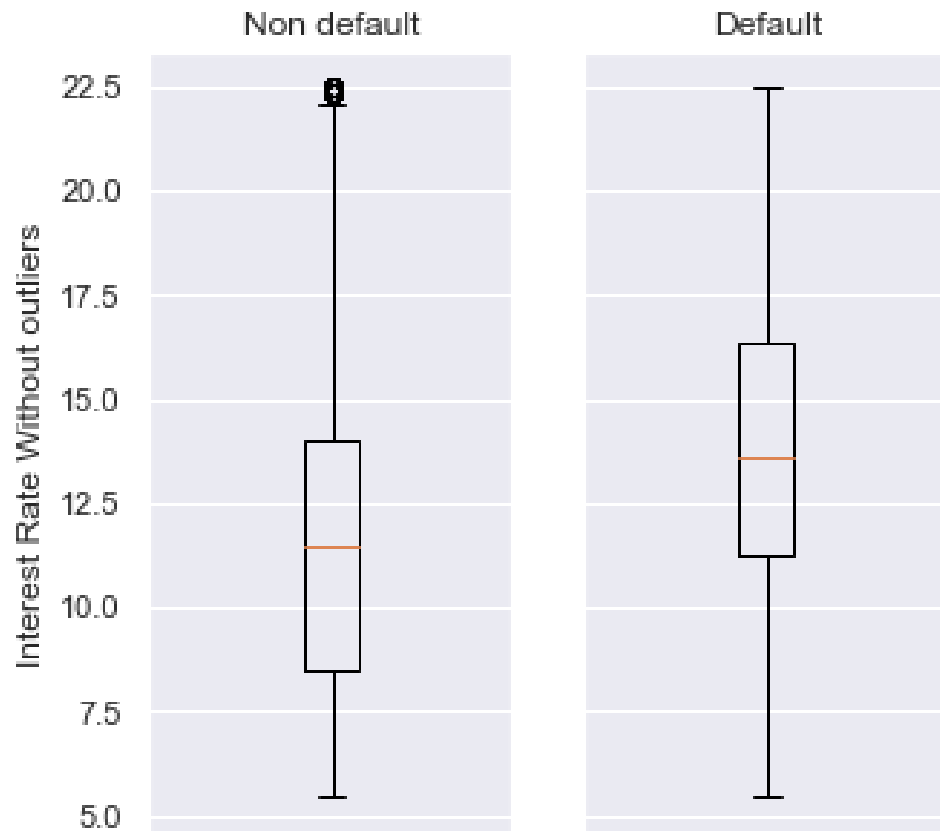
# INTEREST RATE ON LOANS

- Findings: Loans with high interest rate, in the range above 14%, tends to get default more often, since interest compounds exponentially over time.

- Recommendations: Approve loans with a certain limit of interest rate.

# LENDING CLUB ASSIGNED LOAN GRADES

- Lending club assigns grades to loans based on borrower's capability to repay loan

- Most loans are assigned grades A to F, with G having a minute sample space
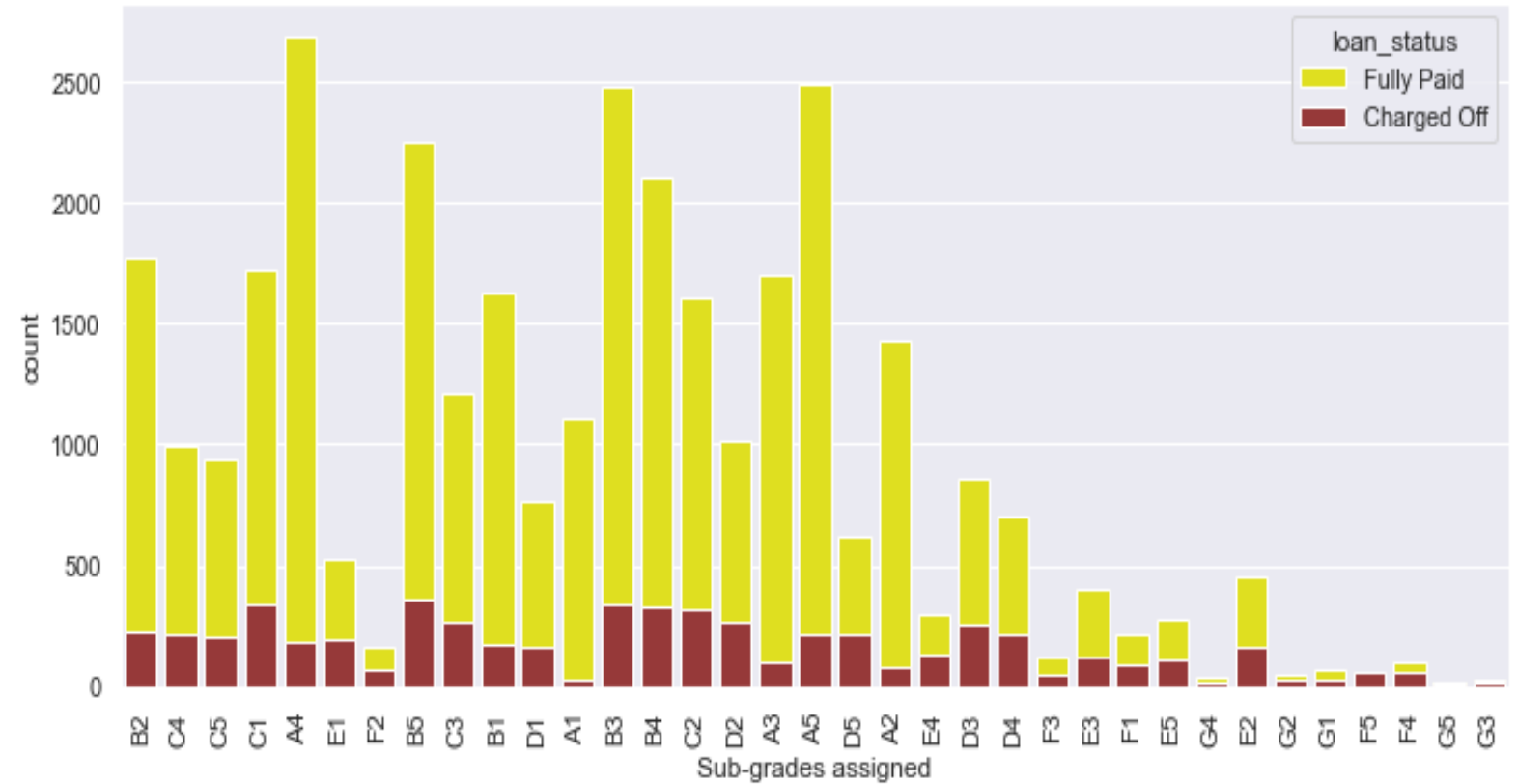
# DEFAULT LOAN PERCENT WITH RESPECT TO LOAN GRADES

- Findings: Loan default percent increase from grade A to grade G without exception.

- Loan grading assigned by lending club is a reliable criteria in identifying risky loan applications

- Recommendations: Lending club should scrutinize loan applications strictly falling under any loan grade after B before approving it.

# LENDING CLUB ASSIGNED LOAN SUB GRADES

- Lending club further assigns loan sub grades under all the loan grades based on risk and volatility.

- Sub grade are marked 1 to 5 with 1 being the best in a grade and 5 has the highest risk.

- The distribution matches with the loan grades

# DEFAULT LOAN PERCENT WITH RESPECT TO LOAN SUB GRADES

- Findings: Loan default percent increase from sub grade 1 to 5 within a loan grade

- Loan sub grades assigned by lending club is a reliable criteria in identifying risky loan applications within a loan grade

- Recommendations: Lending club should scrutinize loan applications strictly falling as sub grades increase from 1 to 5 under a grade
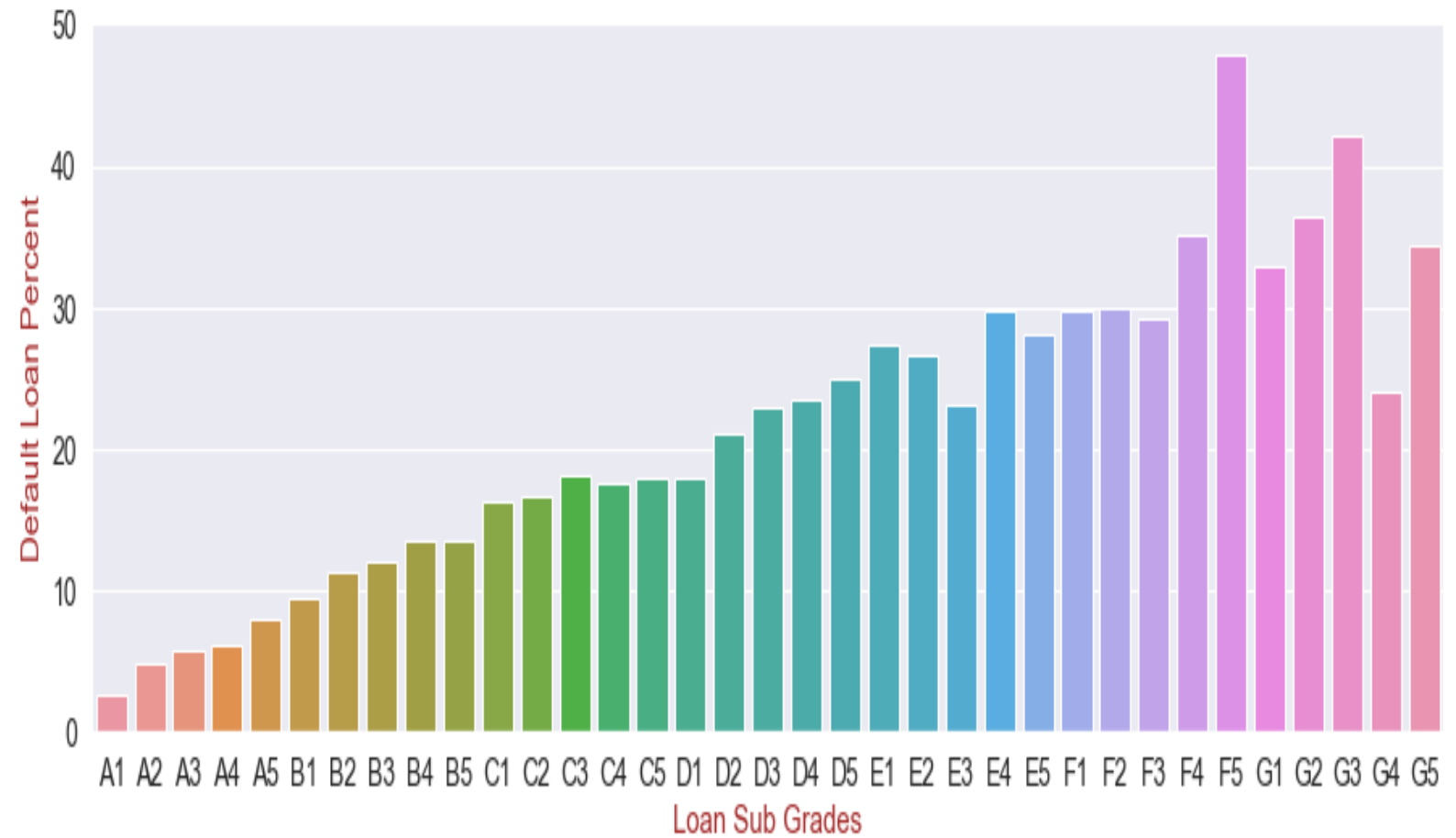
# DISTRIBUTION OF LOANS AS PER BORROWER ASSIGNED TITLE

- Findings: Borrowers assign loan titles in certain categories but most of the categories have a lot of variations. Eg: personal loans, personal, personal loan

- Recommendations: Lending club should recommend borrowers to choose title from a certain category for better classification and risk management
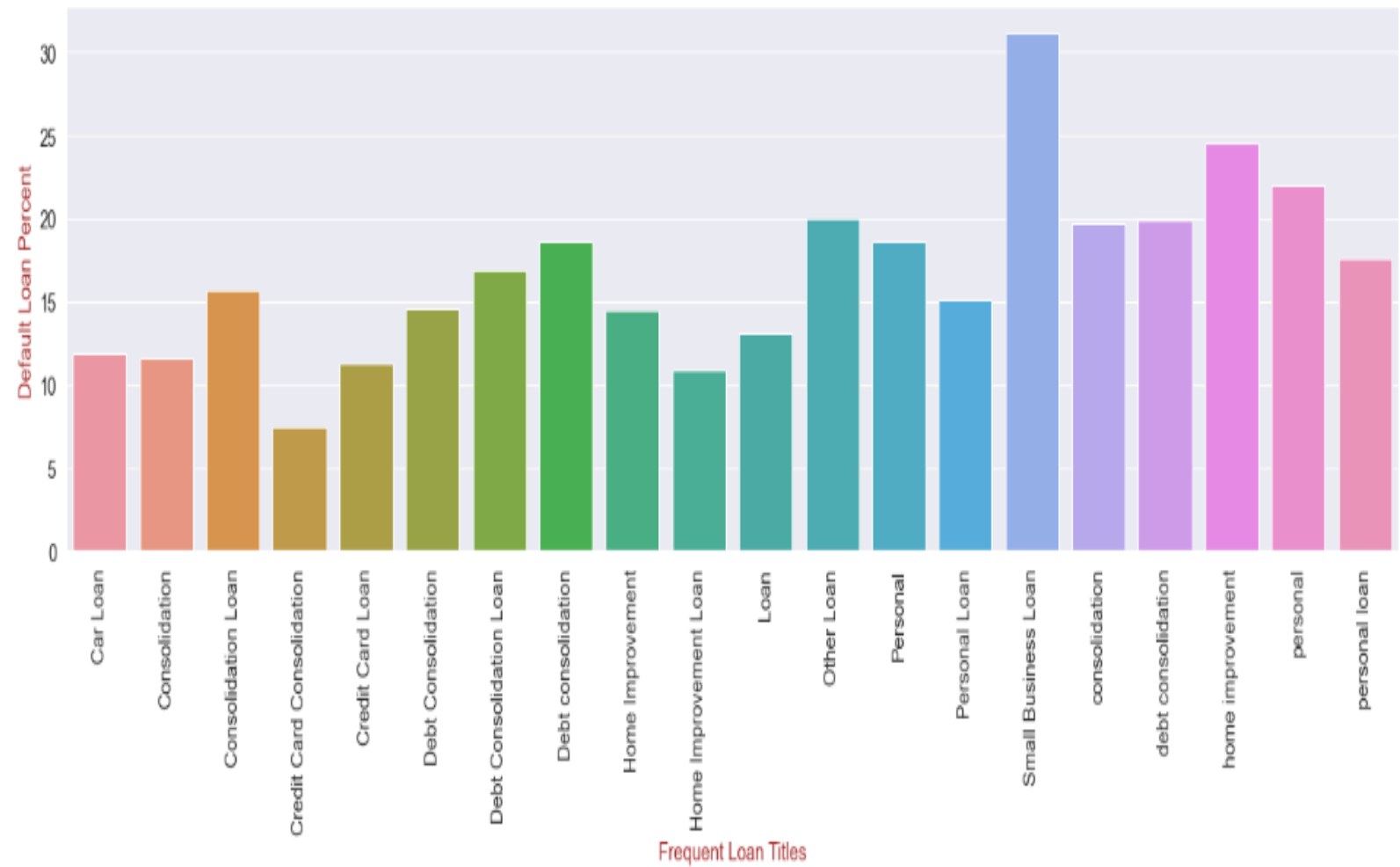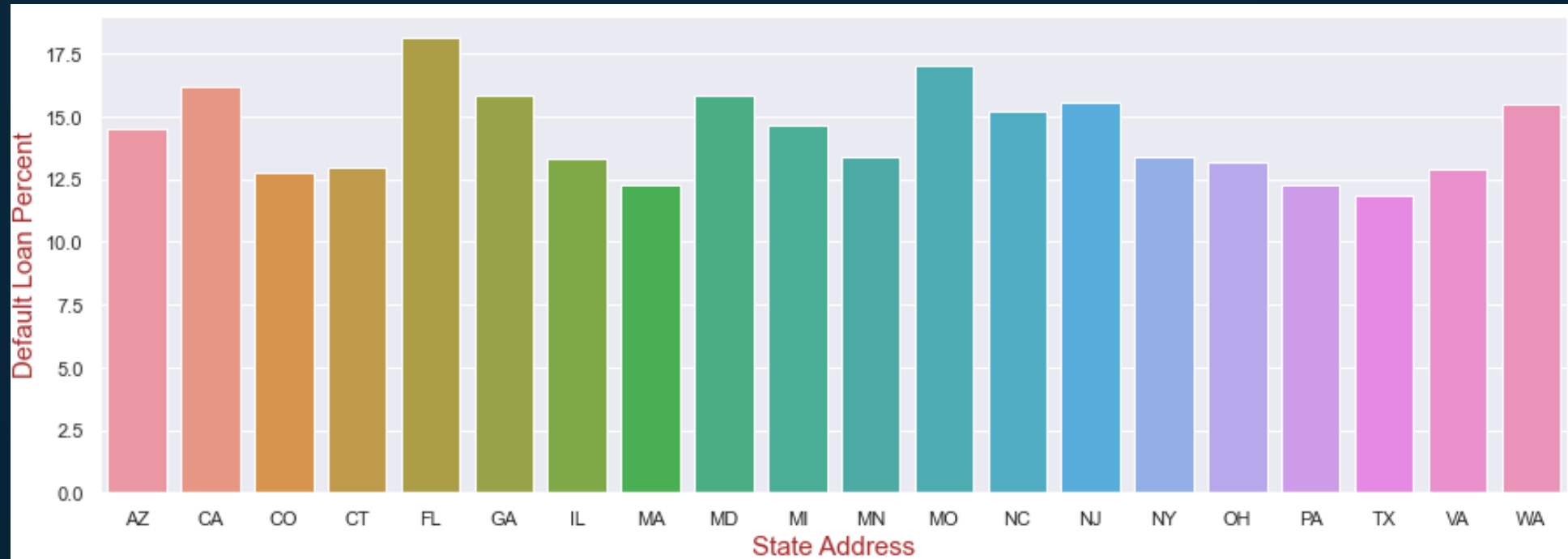
# DEFAULT LOAN PERCENT WITH RESPECT TO LOAN TITLES

- Findings: Loans titles with variations of small business loans are at the highest risk of default

- Recommendations: Lending club should approve loan titled 'small business loan' very carefully.
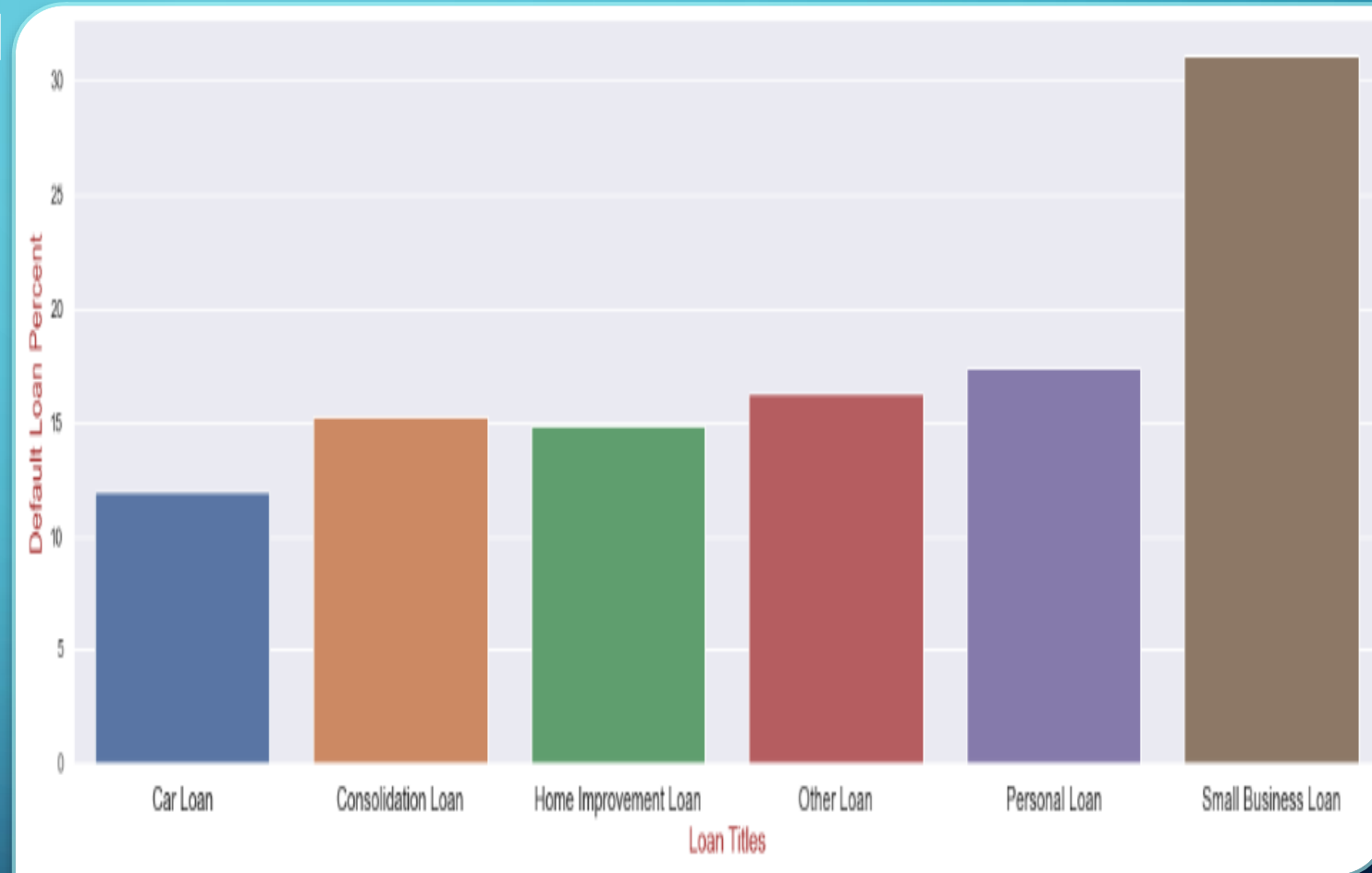
# DEFAULT LOAN PERCENT WITH RESPECT TO STATE ADDRESS

# BORROWERS' STATE ADDRESS FINDINGS AND RECOMMENDATIONS

- Findings: Borrowers belonging to Missouri(MO) and Florida(FL) have defaulted more on their loans

- Recommendation: Loan applications, with borrowers belonging to Missouri and Florida, should be approved pretty carefully.

# DISTRIBUTION BY LOAN TERM (DURATION)
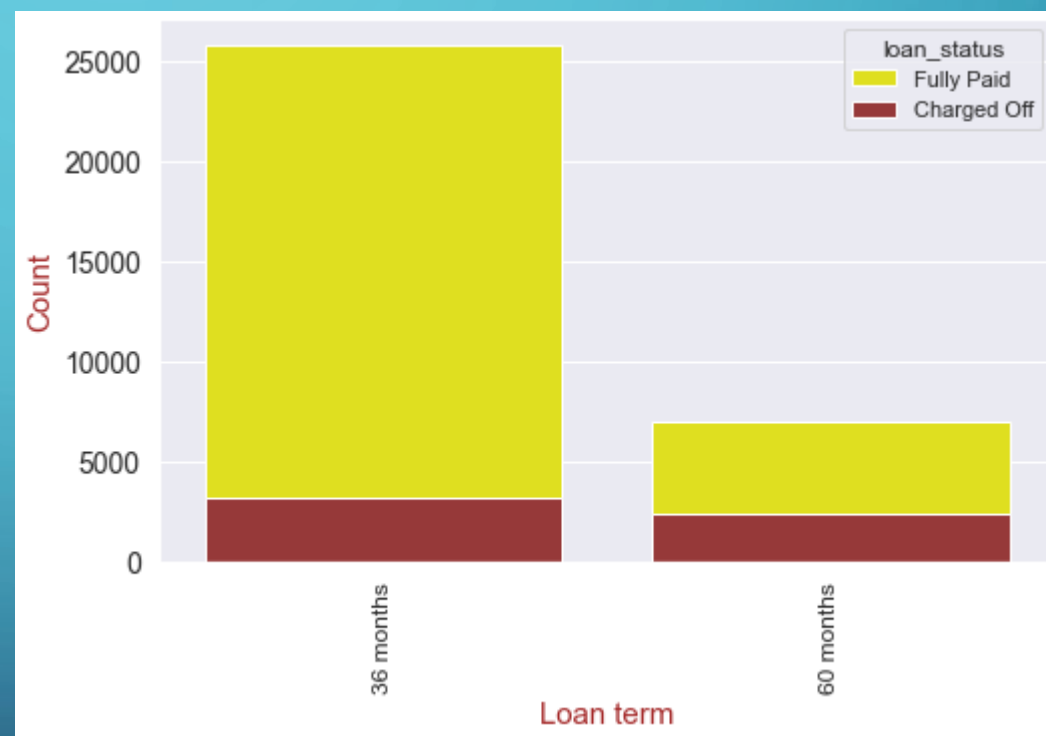
# DEFAULT LOAN PERCENT FOR LOAN DURATION

- Findings: As the duration of loans increased, the frequency of default increased as well

- Recommendation: As per the findings, long duration loan (60 months) should be approved after strict scrutiny as the risk is high

# DISTRIBUTION OF LOANS WITH RESPECT LOAN ISSUED MONTH

- Except for one or two exceptions, the frequency of approved loans increased from Jan to Dec
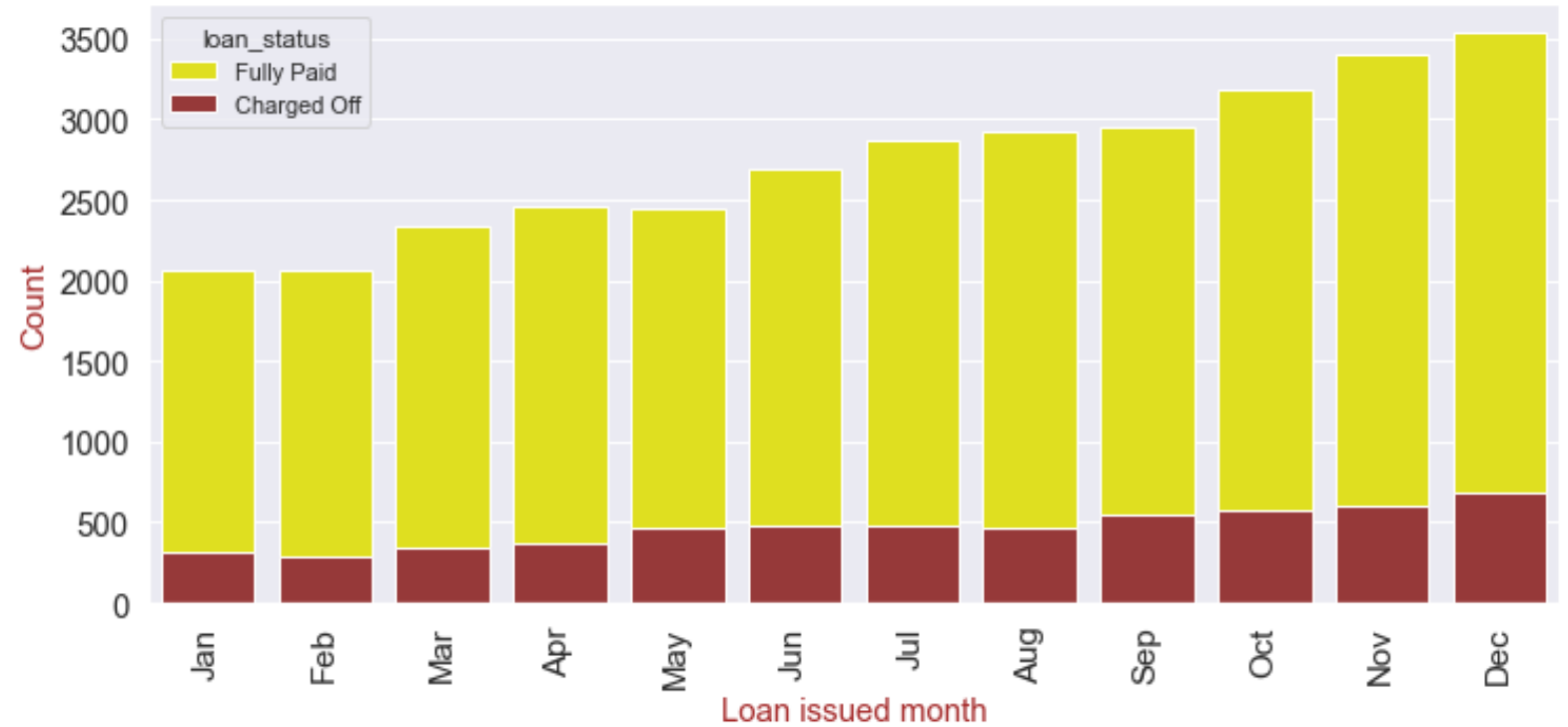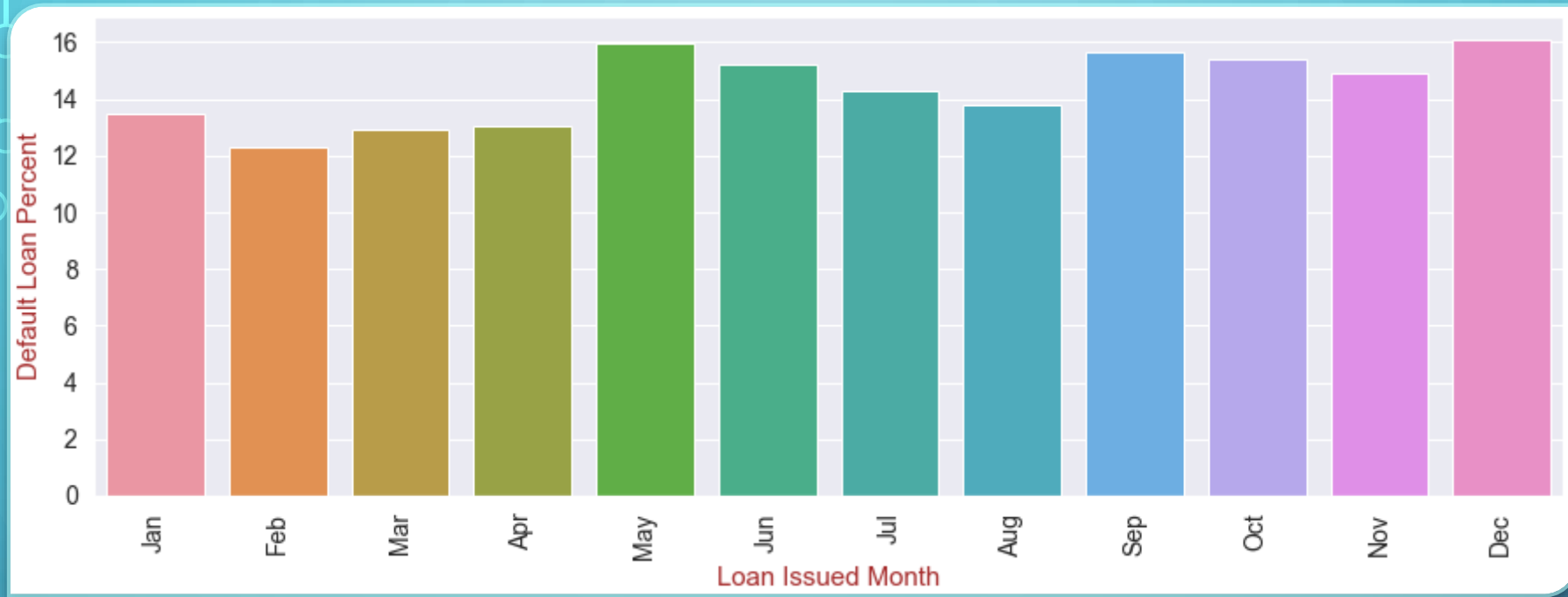
# DEFAULT LOAN PERCENT AS PER ISSUED MONTH

AFTER APRIL, THE PERCENTAGE OF DEFAULT LOAN INCREASES. IT IS DIFFICULT TO PREDICT THE REASON, BUT AS A RECOMMENDATION – APPLICATIONS DURING MAY AND DECEMBER SHOULD BE APPROVED WITH CAUTION

# SUMMARY

- Loans with high interest rate tend to get defaulted more. Since interest rate compounds and overall repayment amount gets big exponentially over time, loans given at lower interest rate could be safer

- Long given on 60 months durations tend to get default more often. Applications for long term loan should be approved with caution.

- Lending club assigned loan grades based on consumers' attributes is very useful. The default percent increases from grade A towards G, thus loan applications going from A to G should be approved very carefully.

- In a particular grade, the default frequency increases from 1 to 5 subgrades. Loan assigned with bigger sub grades should be approved with caution.

# SUMMARY CONTINUED

- Loans titled 'Small business loan' are risky and should be approved carefully understanding that the chances of default could be high.

- Loans taken for the purpose of small businesses are risky as we know from the title of the loans as well. Loan with this purpose should be approved understanding the amount of risk involved.

- Consumers belonging to Missouri(MO) and Florida(FL) have defaulted more on their loans. Loan applications with consumers from these states should be more scrutinized

- As late as the month is issued in a US fiscal year, the chances of default increases. Loan applications coming late in the fiscal year cycle should be approved carefully.