

# **Part II - Prosper-Loan-Data-Analysis**

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# Investigation Overview

This study aimed to investigate factors that affect borrower rate and loan amount in the Prosper loan dataset. The majority of loans in the dataset were found to be current, with 23.2% being completed loans and 8% being charged off or defaulted. The ProsperScore, a custom risk score ranging from 1-10 with 10 being the best or lowest risk score, had a bell-shaped distribution with the highest count of 12,595 borrowers for score 4 and 12,503 borrowers for score 8. BorrowerAPR was found to be slightly higher than BorrowerRate, which makes sense due to additional fees such as mortgage, insurance, and closing costs. Prosper rating C had the highest frequency with 21.6% of total loans, while rating AA had the lowest frequency with 6.3%. Most of the borrowers were employed, and more non-employed individuals were issued loans than those with part-time jobs. Most Prosper borrowers had a debt to income ratio around 30%, with debt consolidation being the most common loan type, followed by home improvement and business loans. The most common loan term was 36 months or 3 years, followed by 60 months or 5 years, and very few borrowers had taken 12-month loans. Borrower rate was found to have increased significantly from 2009 to 2011 and dropped sharply from 2012. Borrowers with higher incomes, employment status, and who own a house tend to have lower rates than those with lower incomes, unemployment, and no homeownership. Prosper score, rating, wage, employment status, and homeownership were found to have a strong relation to borrower rate and APR. Short-term loans had a lower APR than long-term loans, and Prosper rating and loan status were found to affect the borrower APR, with AA and A ratings having the lowest APR and E and HR ratings having the highest APR. Charged off and defaulted loans had a higher APR than current and past-due loans. The loan original amount was found to be affected by income range, homeownership, and Prosper rating, with high-income borrowers who own a house having a loan original amount of around \$10k to \$35K. Borrowers with HR rating, even with high income, had a very high rate.

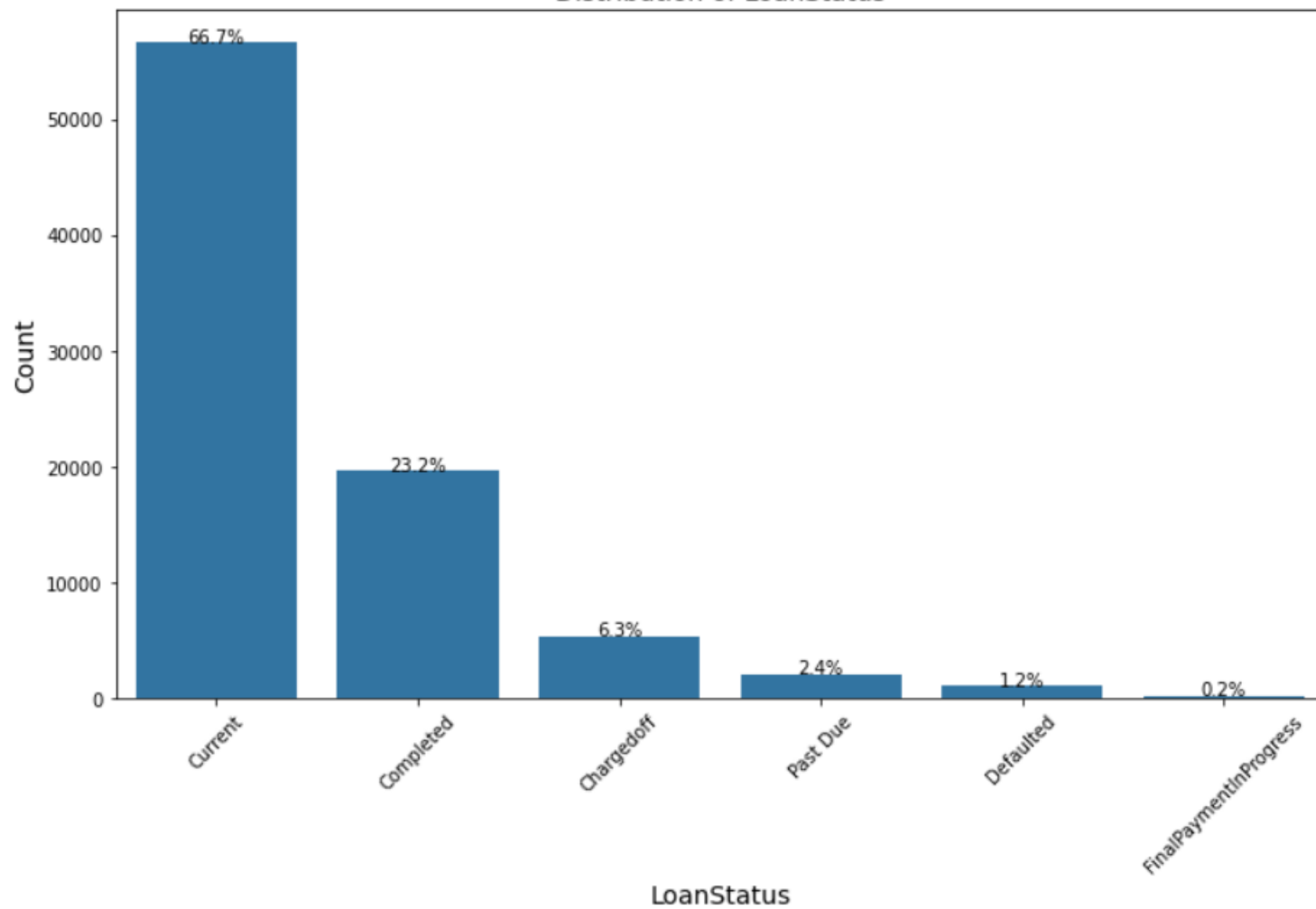
# Dataset Overview

The Prosper loan dataset includes information on 113,937 peer-to-peer loans facilitated by the credit company Prosper. The dataset includes 81 variables for each loan, including the date the loan was created, the loan number, the loan term, the current status of the loan, the borrower's APR and rate, the Prosper rating and score, and various other details about the borrower and the loan. The dataset covers loans made between 2009 and 2014 and includes information about the borrower, such as their income, employment status, and credit score, as well as information about the loan itself, such as the loan amount and the interest rate. Some data cleaning was done to make sure that the analysis and visualization were accurate and trustworthy.

# Loan Status Distribution

The majority of loans in the dataset were found to be current with 66.7%, with 23.2% being completed loans and 8% being charged off or defaulted. Other 2.4% past-due were aggregated together under one variable name Past-due.

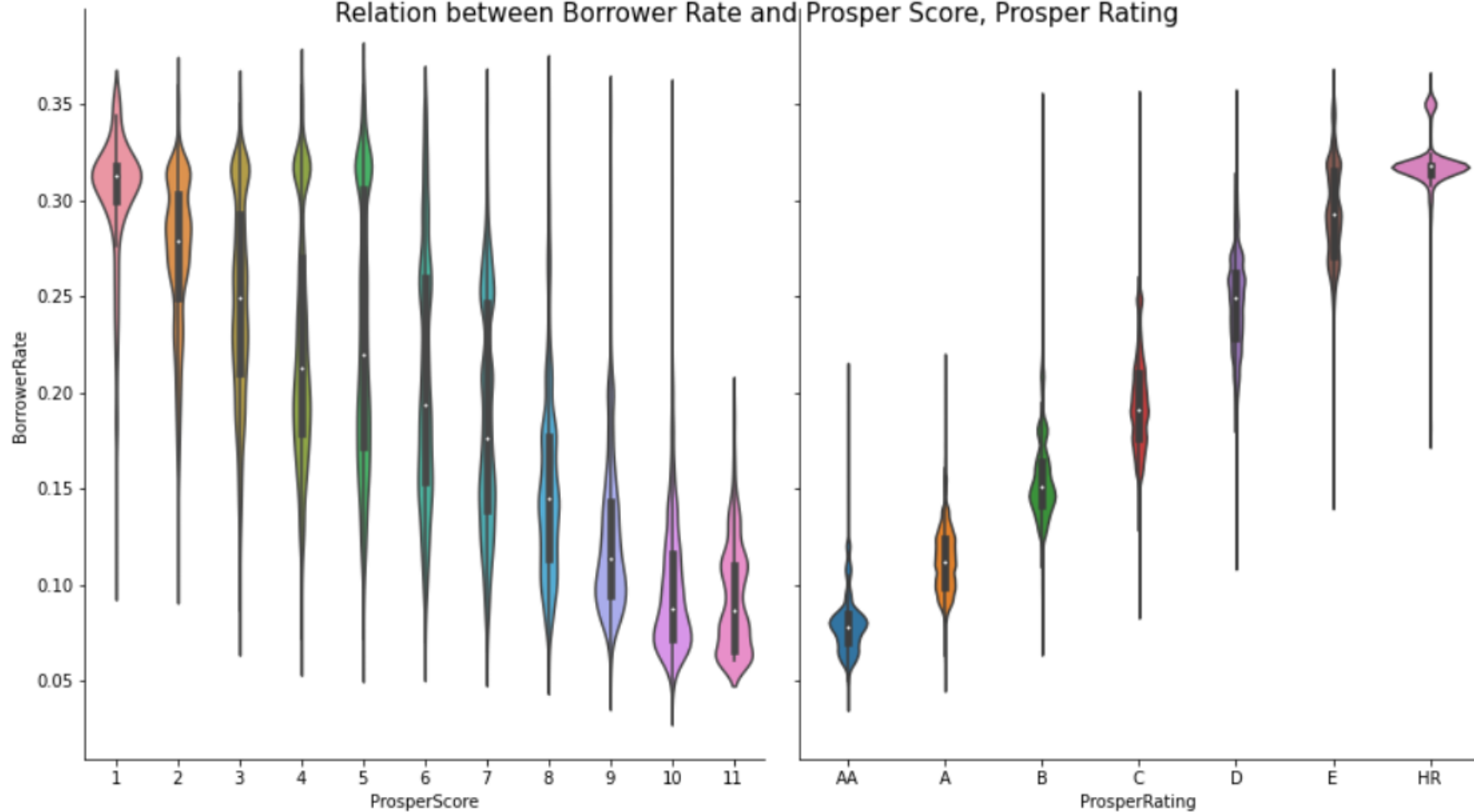
Distribution of LoanStatus



## Relation between Borrower Rate and Prosper Score, Prosper Rating

Prosper score and rating is a good key to figure out if a borrower would get a low or high rate. From our observation we see that high prosper score borrower get lower rate and lowest prosper score borrower get as high as 35% rate. Also, AA prosper rating borrower's get low rate while HR rating borrower's get high rate.

Relation between Borrower Rate and Prosper Score, Prosper Rating

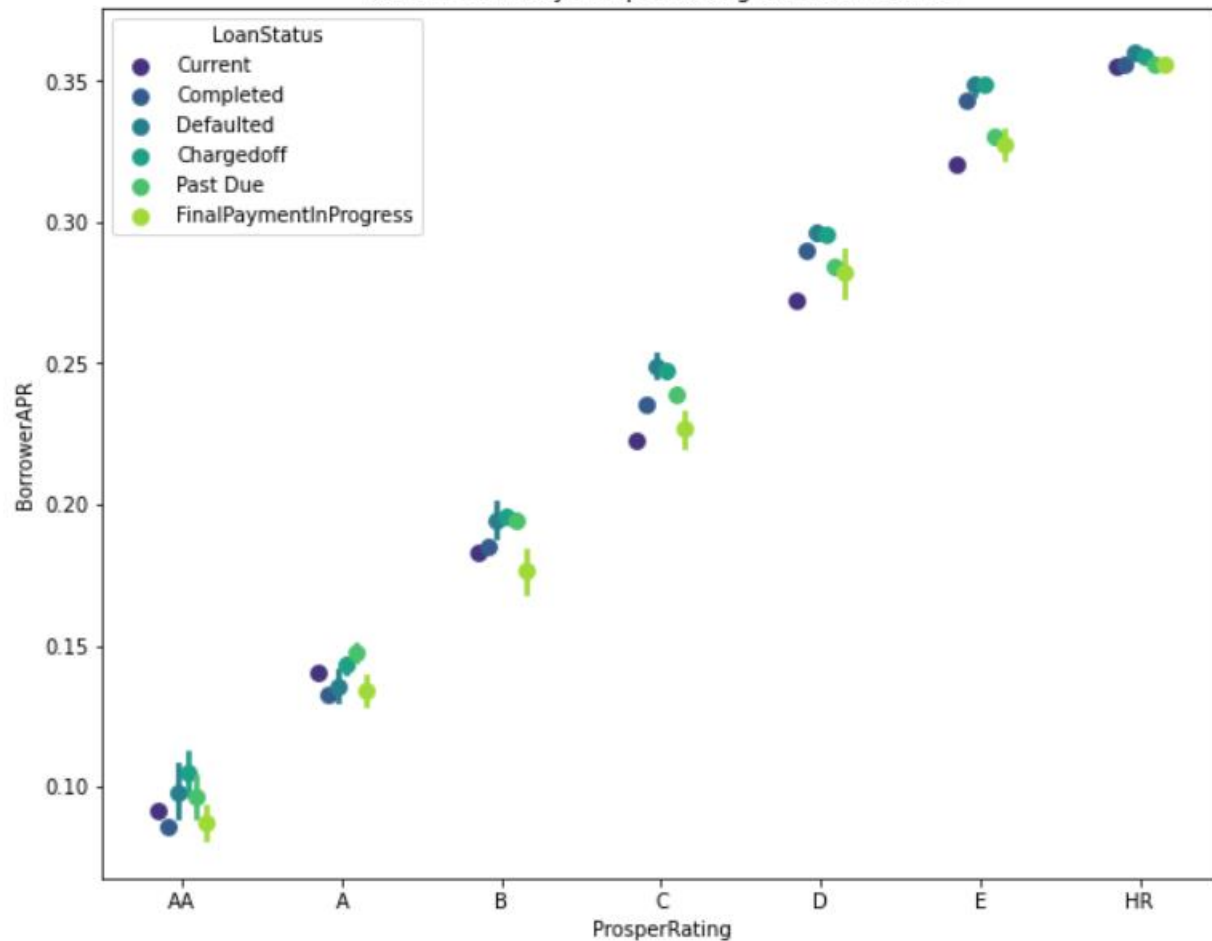


## Borrower APR by Prosper Rating and Loan Status

From our observation we see that Prosper rating and loan status effect the borrower APR. AA and A rating gets lowest and low APR while E and HR get high APR. Defaulted and charged off loans do have high APR than current and past due.



Borrower APR by Prosper Rating and Loan Status



## Loan original amount and Income range by homeowner status

Borrowers with higher incomes, and who own a house tend to have lower rates than those with lower incomes, unemployment, and no homeownership. Prosper score, rating, wage, employment status, and homeownership were found to have a strong relation to borrower rate and APR. Also, income range and home ownership effected loan approved amount as well. We can see that high income range (100K+) and a borrower who is homeowner their loan original amount is around 10k to 35K. Income range 75k-99k and 50k-74k have almost similar loan original amount approved.

Loan original amount and Income range by home owner status

