

This project is a part of Exploratory Data Analysis. The data set I choose is prosper Loan data. This data set contains 113,937 loans with 81 variables for each loan that has been issued. We will be analyzing the various factors that are affecting the loan status and visualize the relationship between various variables.

Variables that are used in the analysis  
**BorrowerAPR**: The Borrower's Annual Percentage Rate (APR) for the loan.

**CreditGrade**: The Credit rating that was assigned at the time the listing went live. Applicable for listings pre-2009 period and will only be populated for those listings.

**OnTimeProsperPayments** : Number of on time payments the borrower had made on Prosper loans at the time they created this listing. This value will be null if the borrower has no prior loans.

**IncomeRange** : The income range of the borrower at the time the listing was created.

**StatedMonthlyIncome** : The monthly income the borrower stated at the time the listing was created.

**LoanOriginalAmount**:The origination amount of the loan.

**ProsperRating (Alpha)**:The Prosper Rating assigned at the time the listing was created between AA - HR. Applicable for loans originated after July 2009.

**DebtToIncomeRatio**:The debt to income ratio of the borrower at the time the credit profile was pulled. This value is Null if the debt to income ratio is not available. This value is capped at 10.01 (any debt to income ratio larger than 1000% will be returned as 1001%).

**LoanStatus**:The current status of the loan: Cancelled, Chargedoff, Completed, Current, Defaulted, FinalPaymentInProgress, PastDue. The PastDue status will be accompanied by a delinquency bucket.

**CreditGrade**:The Credit rating that was assigned at the time the listing went live. Applicable for listings pre-2009 period and will only be populated for those listings.

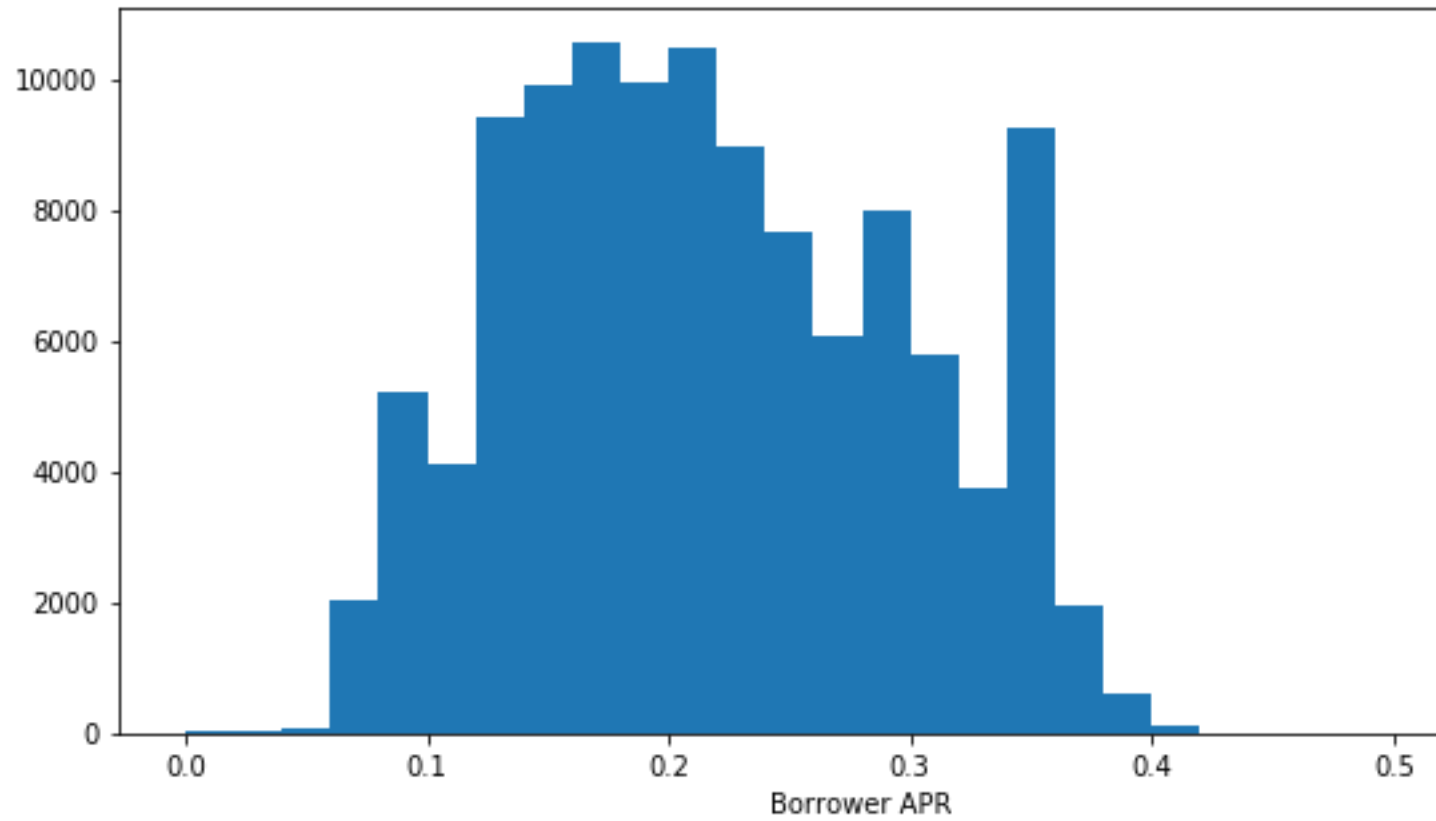
**EstimatedLoss**:Estimated loss is the estimated principal loss on charge-offs. Applicable for loans originated after July 2009.

**OnTimeProsperPayments**:Number of on time payments the borrower had made on Prosper loans at the time they created this listing. This value will be null if the borrower has no prior loans.

Borrowers are concerned with their APR when they apply for the loan, so the primary objective is to analyze Borrower APR and several other factors that are affecting the APR

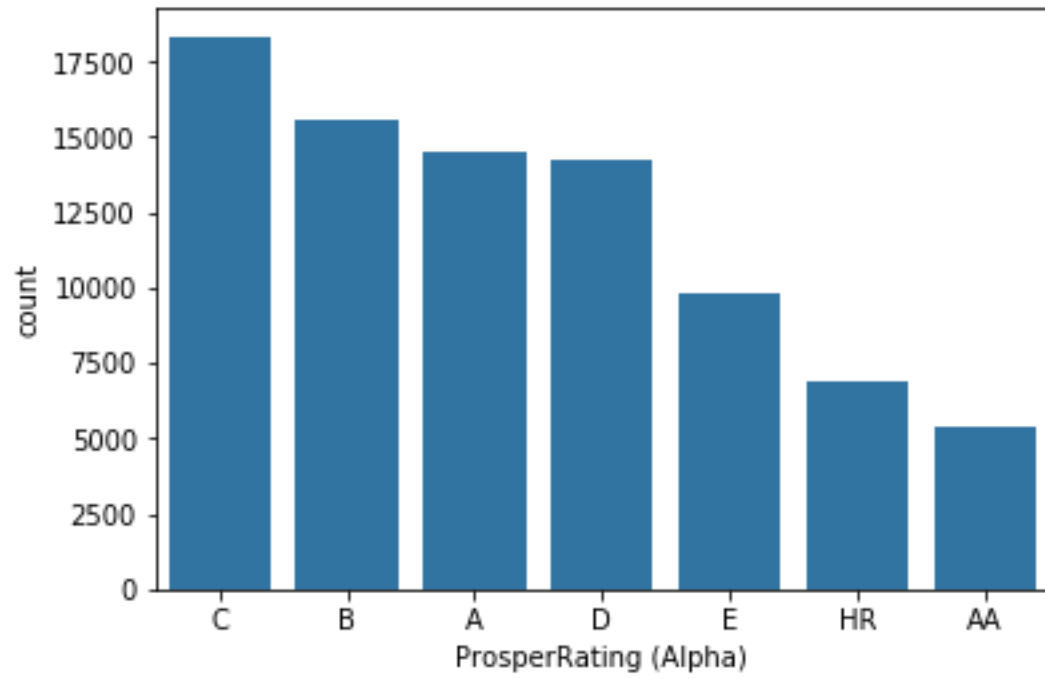
## Univariate Exploration

Lets start by Analyzing Borrower APR and its distribution



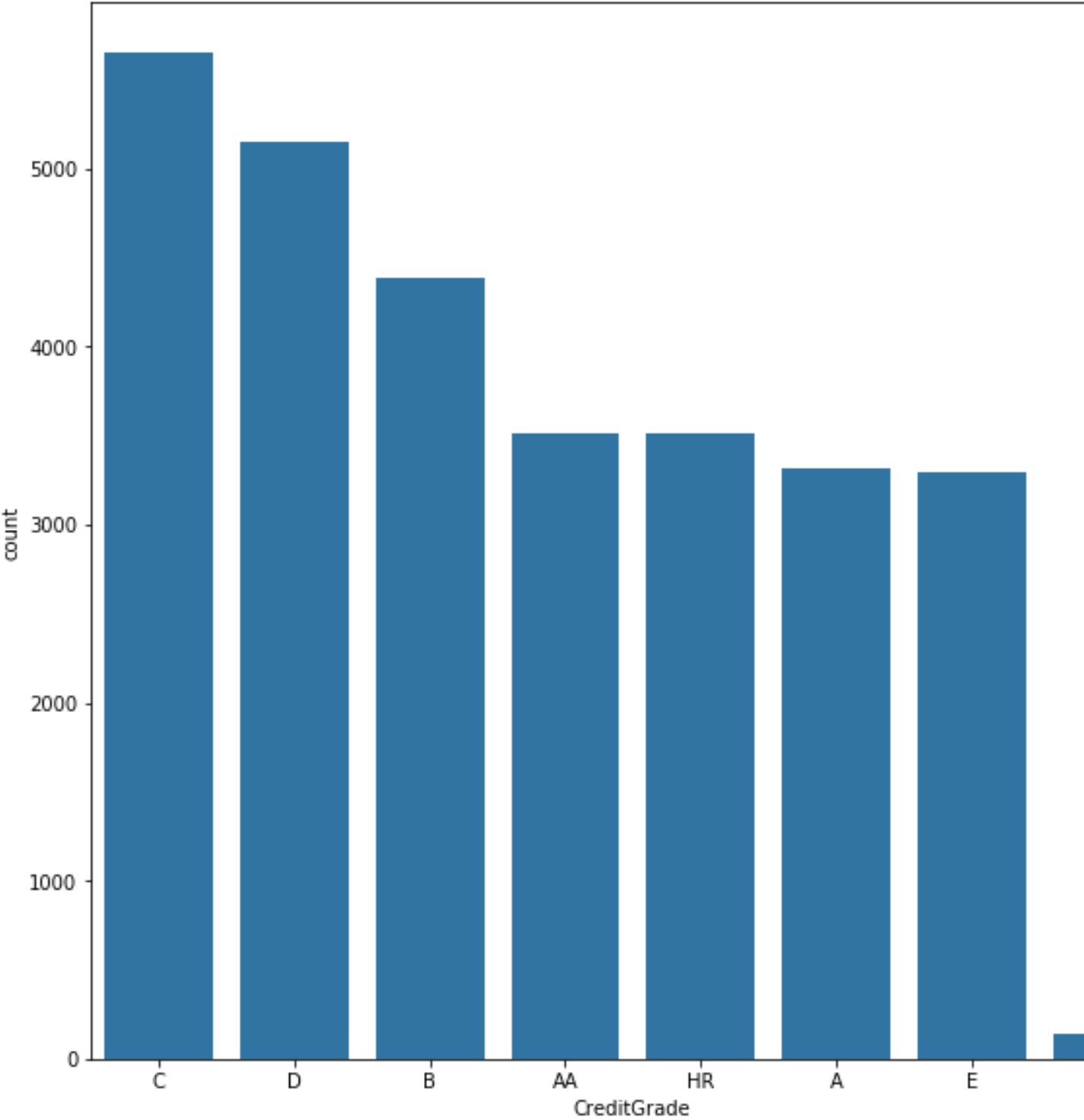
This distribution looks almost normal with the few exceptions. Let us know analyze the variables that affect this APR

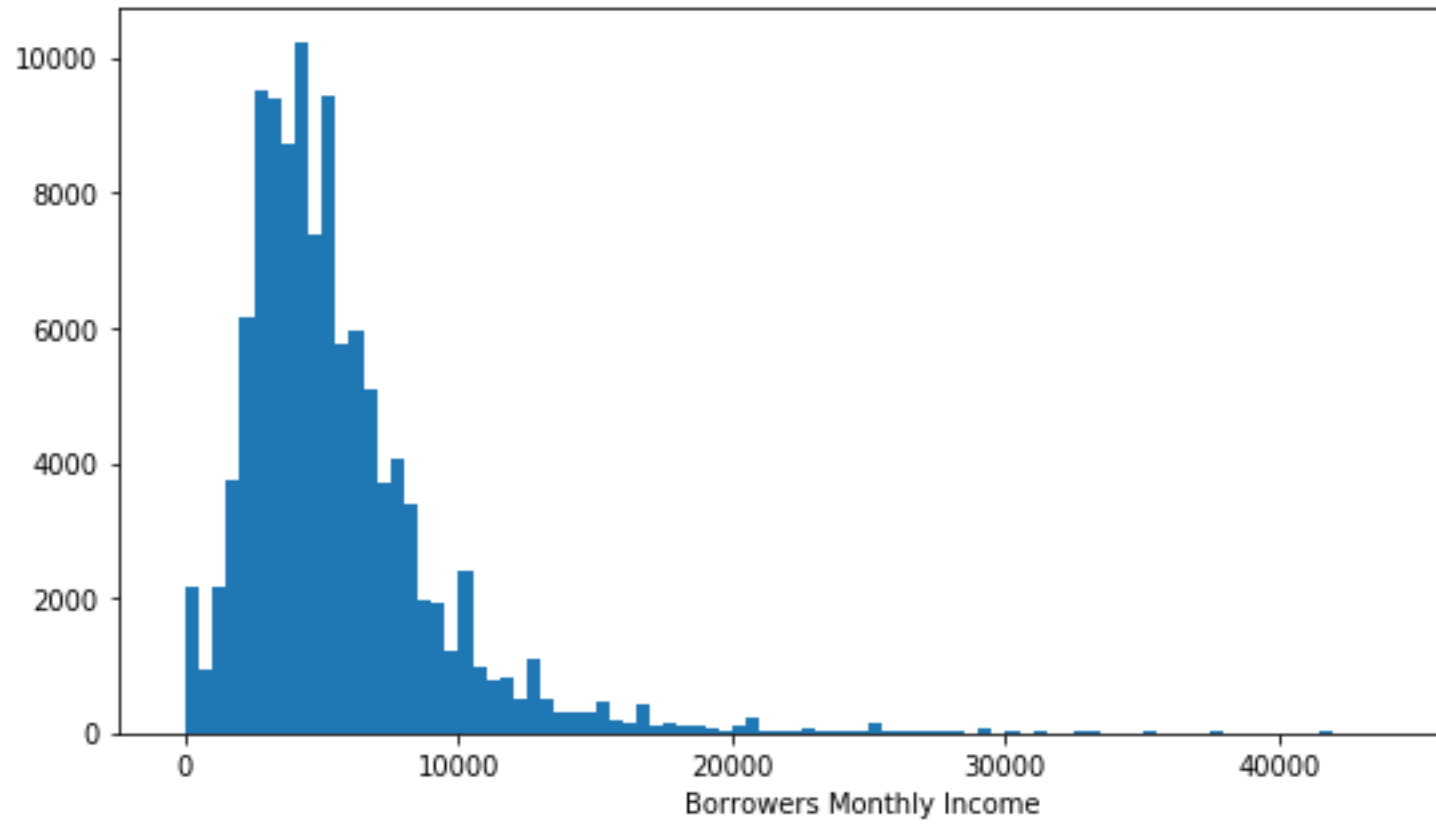
#### **Distribution of Prosper Ratings**



**Distribution of credit Grades**

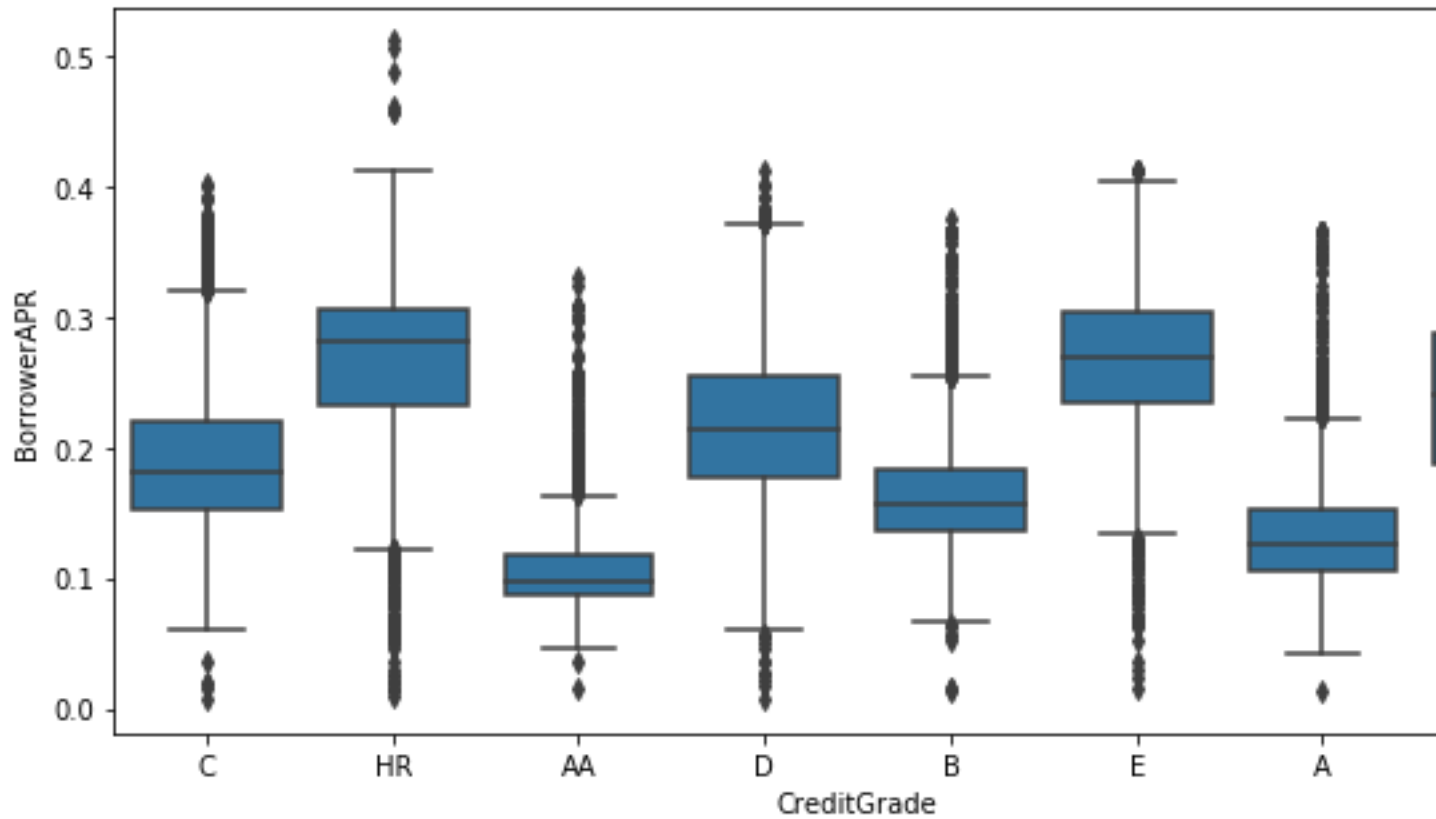
Distribution of Monthly stated income





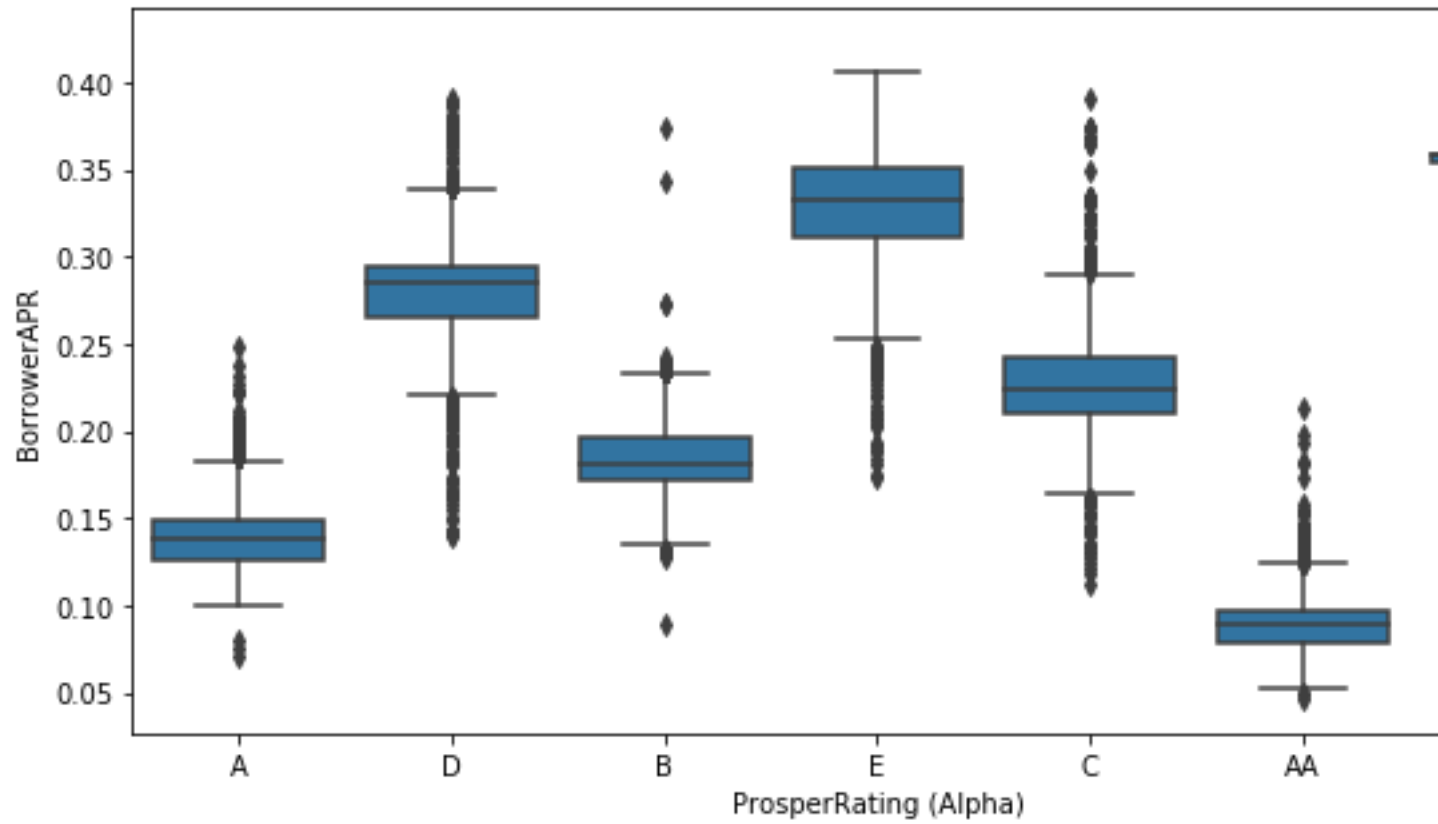
### Bivariate Exploration

We will analyze the relationship between CreditGrade and Borrower APR and see how creditGrade is affecting the APR



It looks like for the given CreditGrade there is very significant amount of variation in the APR. Average APR for people with poor credit grades is higher. For example, looking at the distribution for creditGrade HR we can see that the median APR is higher since they are considered as risky borrowers.

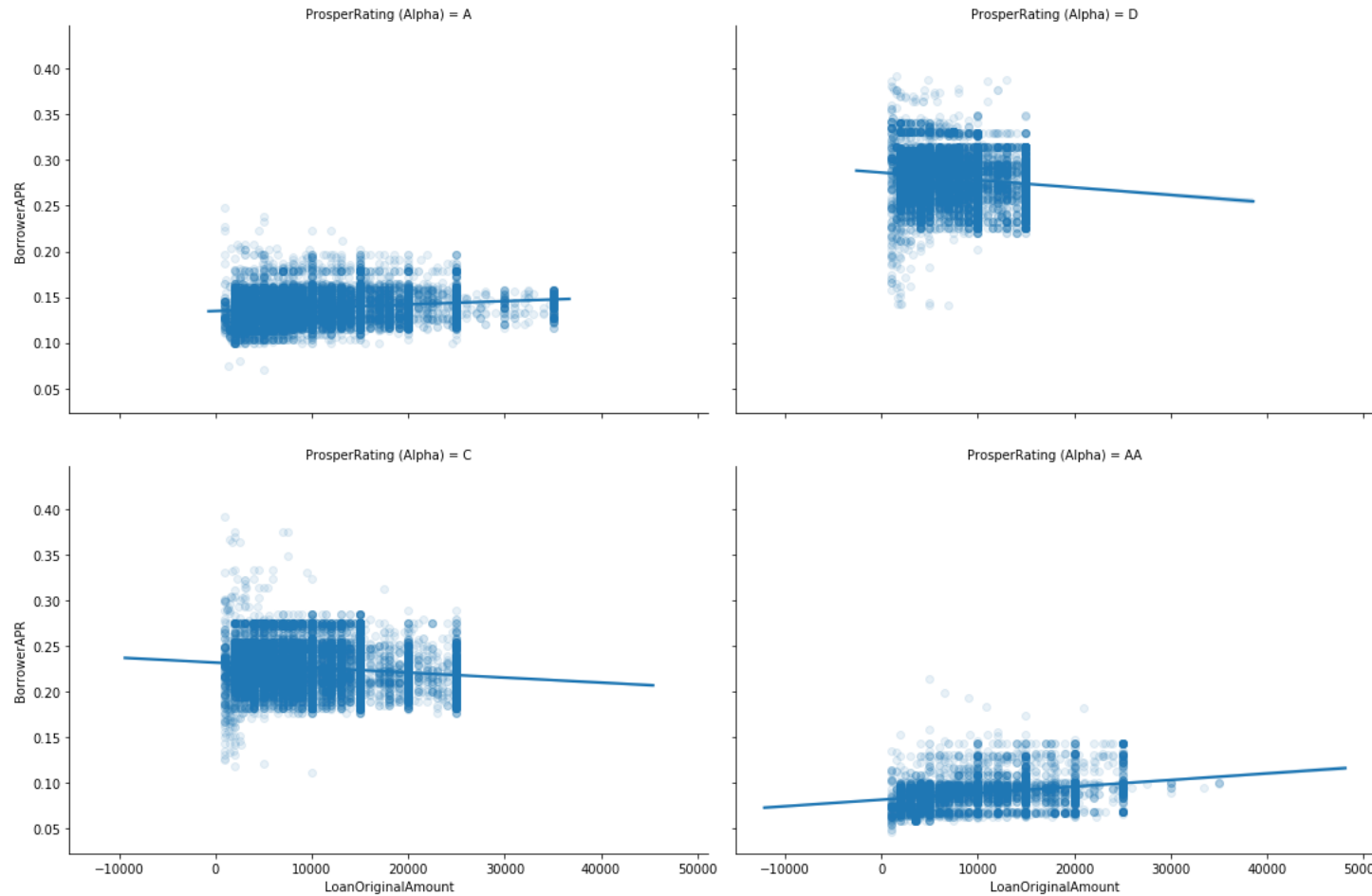
ProsperRating Vs Borrower's APR



Like the creditgrade, if prosper rating is poor then borrower's APR seems to be higher.

#### Multivariate Analysis

In this Multivariate Exploration we are going to analyze the Propser Rating effect on relationship of APR and loan amount



It looks like the loan amount increases with better prosper rating. Looking at the above Grid closely it looks like people with better prosper rating tend to borrow more because they might be getting a good APR and people with less prosper rating tend to borrow less due to high APR

Overall, we can conclude that the BorrowerAPR is positively correlated with the crediGrade and Prosper Rating. Borrowers with good prosper rating are having relatively lower APR. Another interesting find is that borrowers with better prosper ratings tend to borrow more money due to the fact of their lower APR and borrowers with bad prosper rating tend to borrow less because of their higher apr. Borrower APR is also negatively correlated with the loan amount. Couple of other findings which made sense were stated monthly amount is positively correlated with loan amount and loan amount seems to be increased with loan term.