GRAMENER CASE STUDY

SUBMISSION

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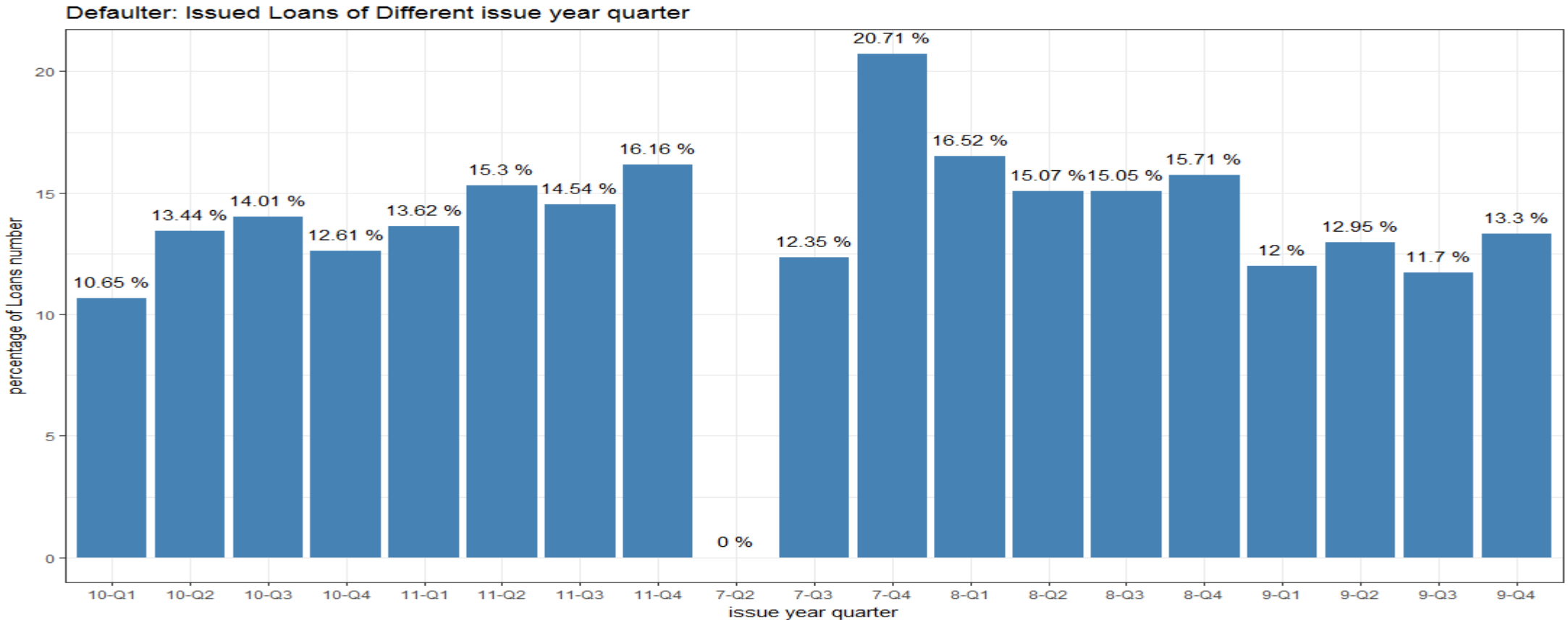
Abstract

Consumer Finance companies, which specialises in lending various types of loans has to make some important decisions based on the applicants profile.
Firstly, if the applicant is likely to repay the loan, then not approving the loan can be loss of business for the customer. And if the applicant is not likely to repay the loan, then approving such loans can lead to financial loss for the company.

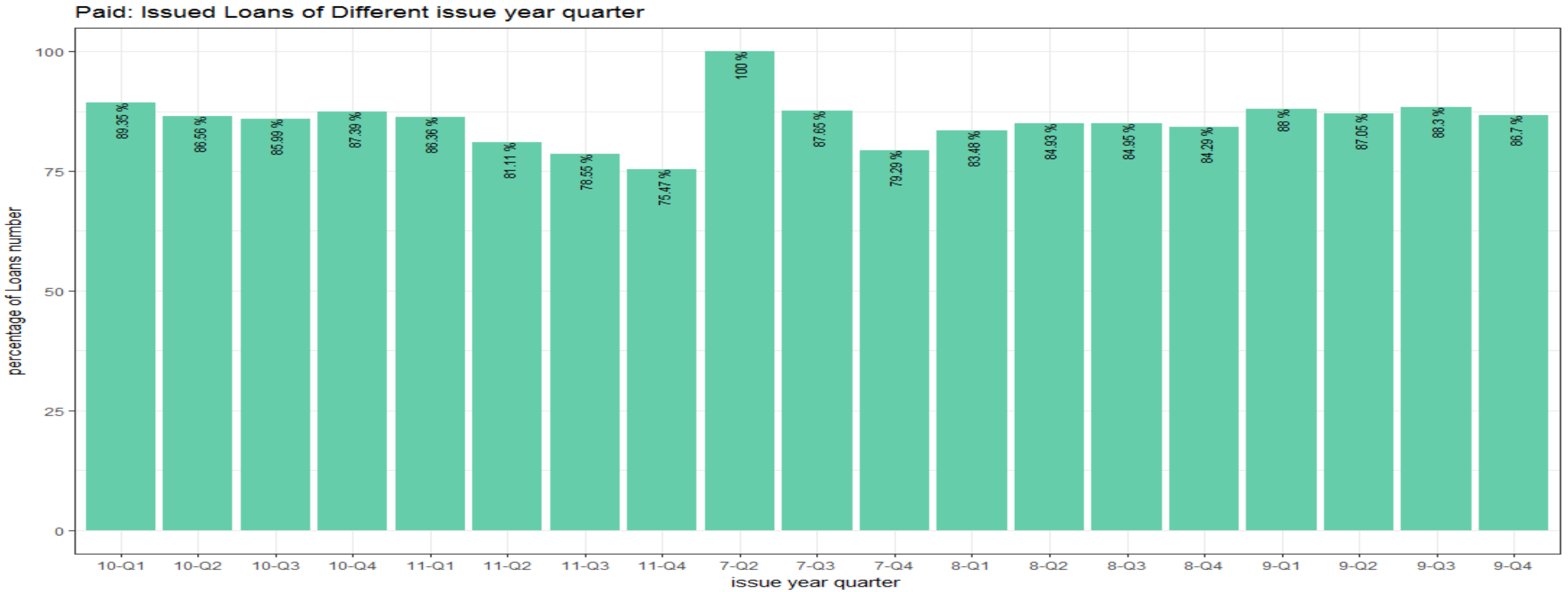
Business objective is to identify such risky loan applicants, and the factors which are strong indicators of an applicant being a defaulter. Data for all loans issued between 2007 – 2011 are present, which are used to visualize the relationship between various variables and to identify defaulters.

Loans issued to defaulters based on per year quarter



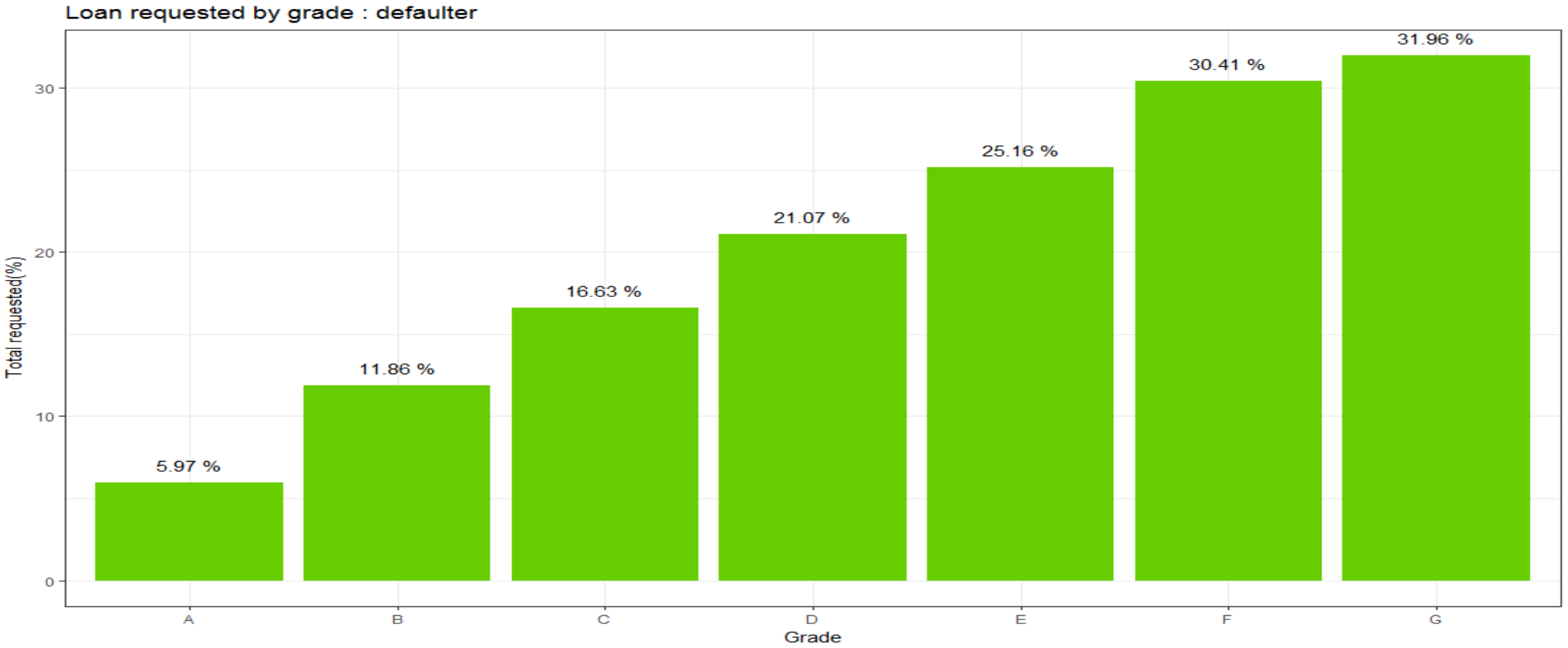
This plot shows the defaulter percentage of loans issued per year quarter. From the plot we can visualize that defaulter loan percentage was highest in Q4 of 2007. For other years there has been a steady rate between 12 to 15 percent.

Loans issued to non defaulters based on per year quarter



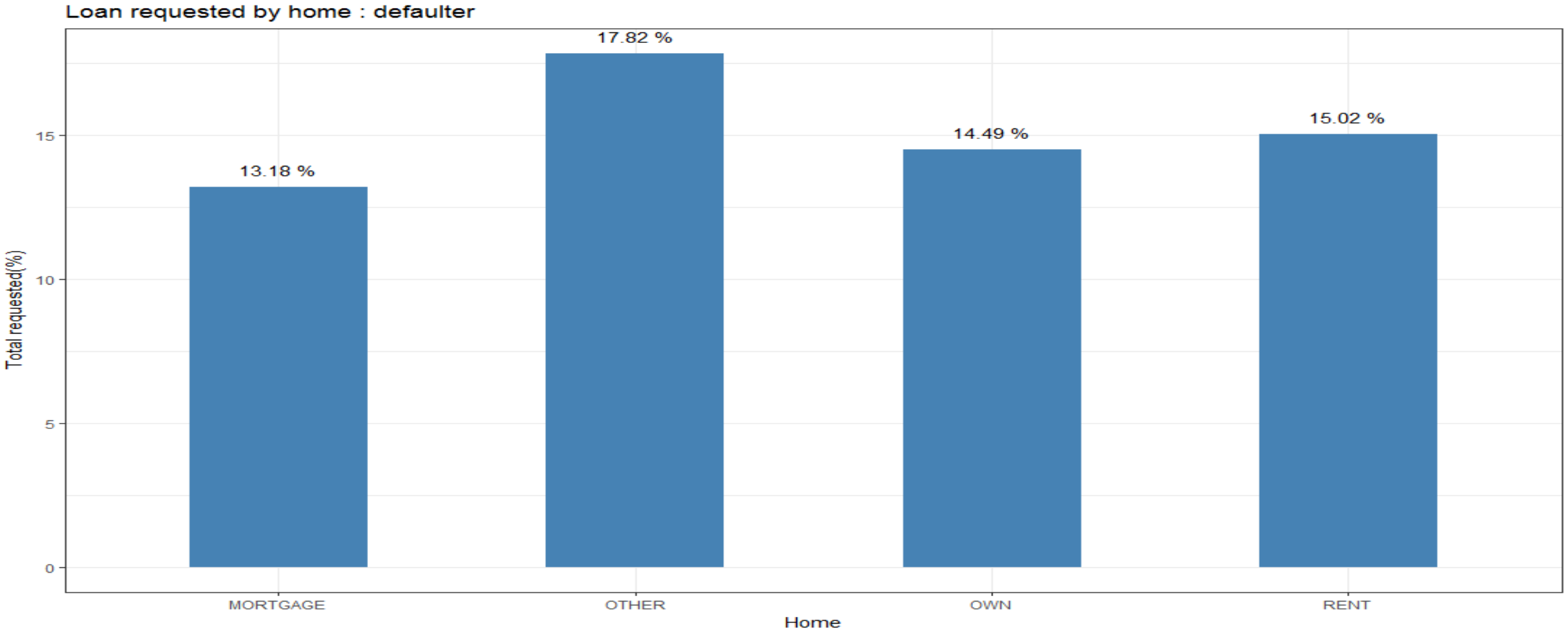
This plot shows year quarter wise number of loan percentage of paid loans. It is not related to charged off loans.

Grade wise charged-off loan



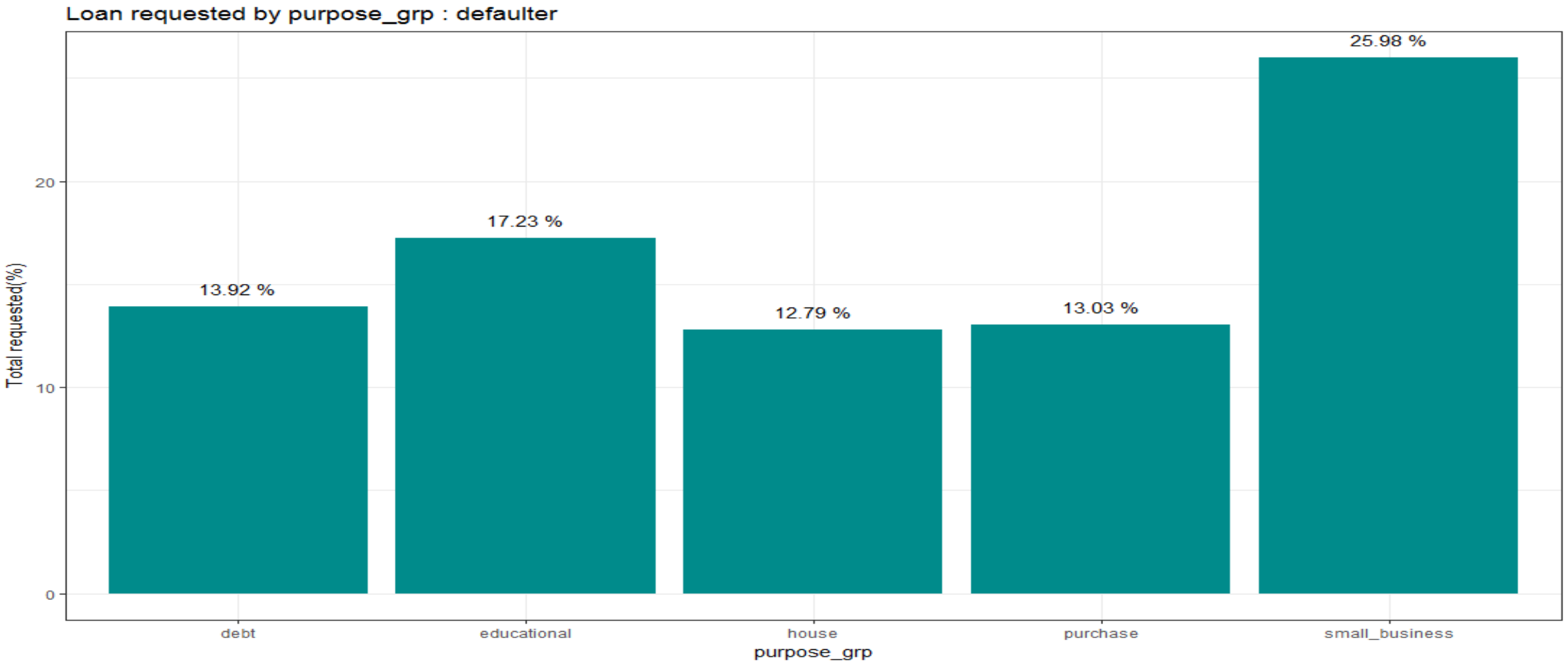
This plot shows the grade wise defaulter loan. It clearly shows that there is a direct relation with grade.
The number of defaulters are getting increased from A to G.

Charged-off loan percentage count by Home



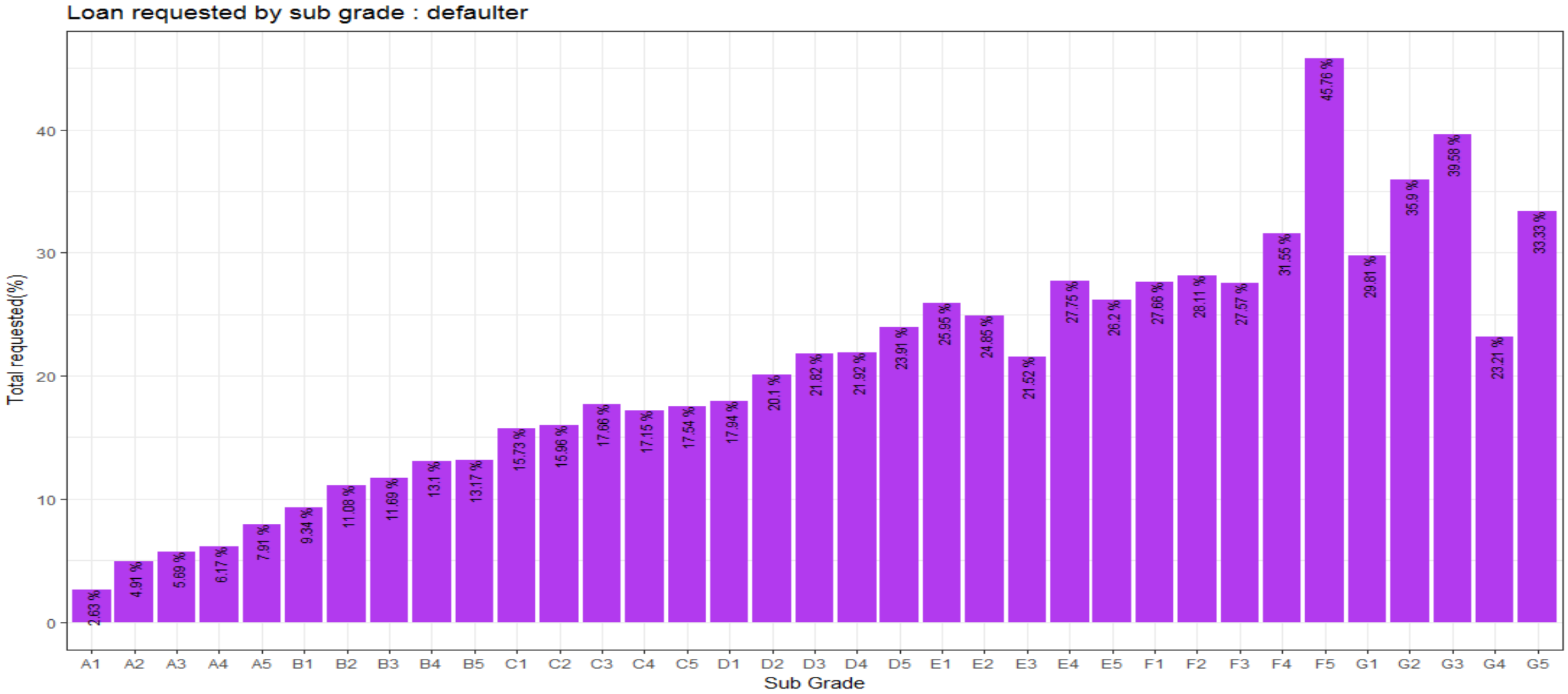
This plot shows the home type – wise defaulter loan percentage count. Here the “Other” home type has most number of defaulters.

Charged-off loan request percentage by purpose group



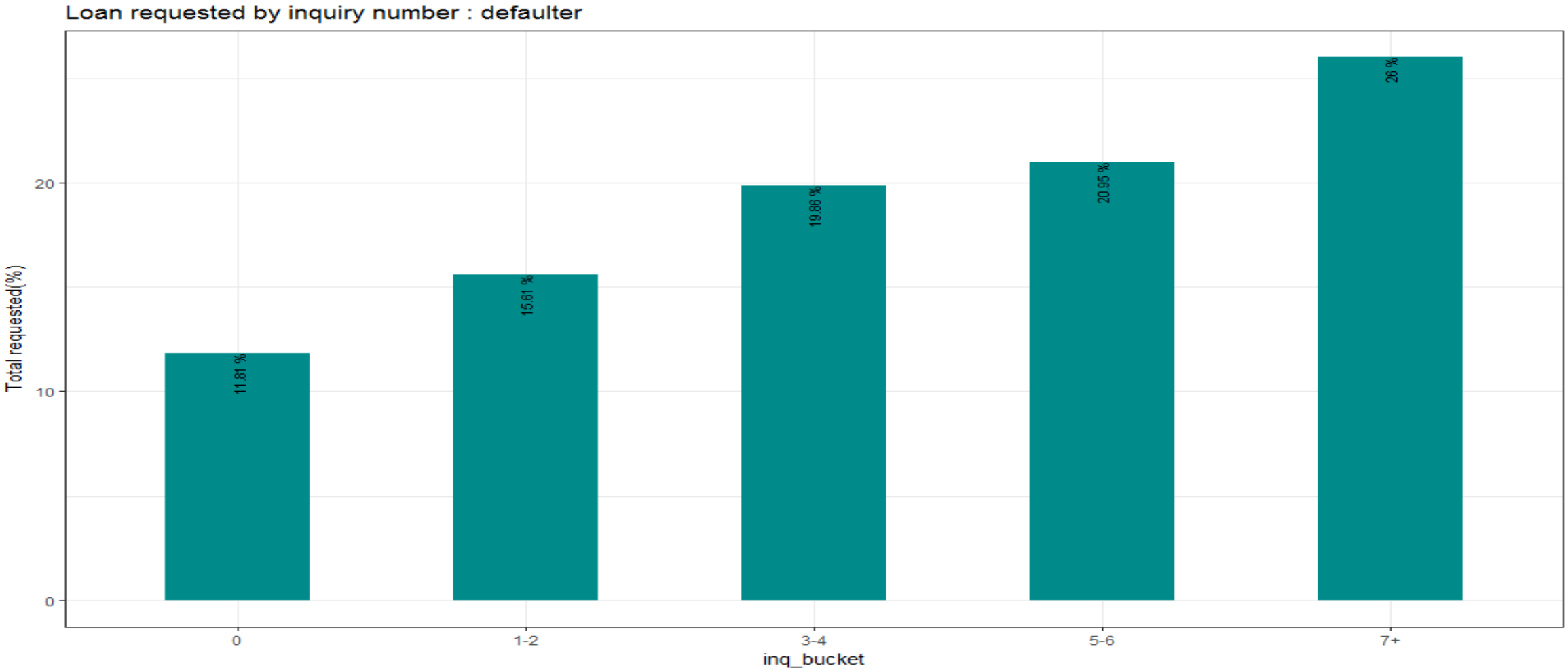
This plot shows the purpose_grp type – wise defaulter loan. The highest percentage of defaulters is for request of small_business or educational purpose.

Sub grade type wise charged_off loan percentage count



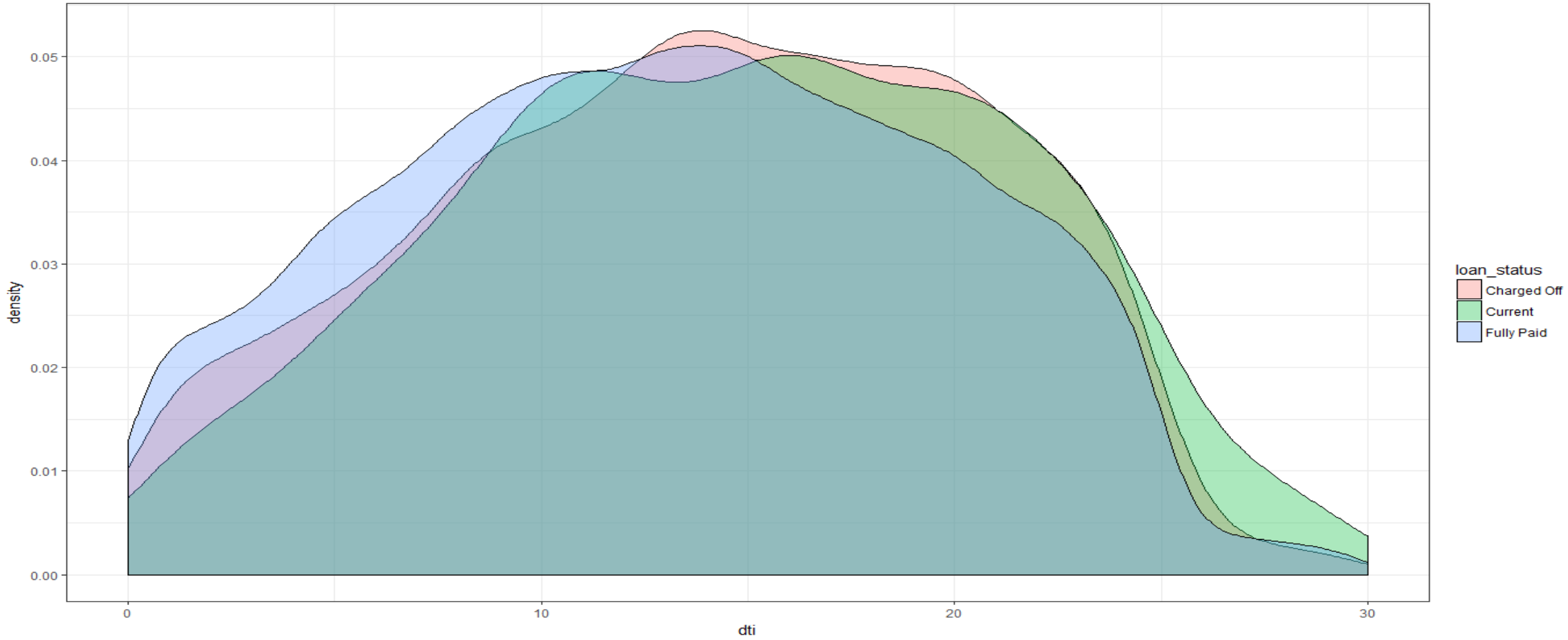
This plot shows the sub grade type-wise defaulter loan percentage count. Here the F5 has the most number of defaulters than any other sub grade

Inquiry bucket type wise charged_off loan percentage count



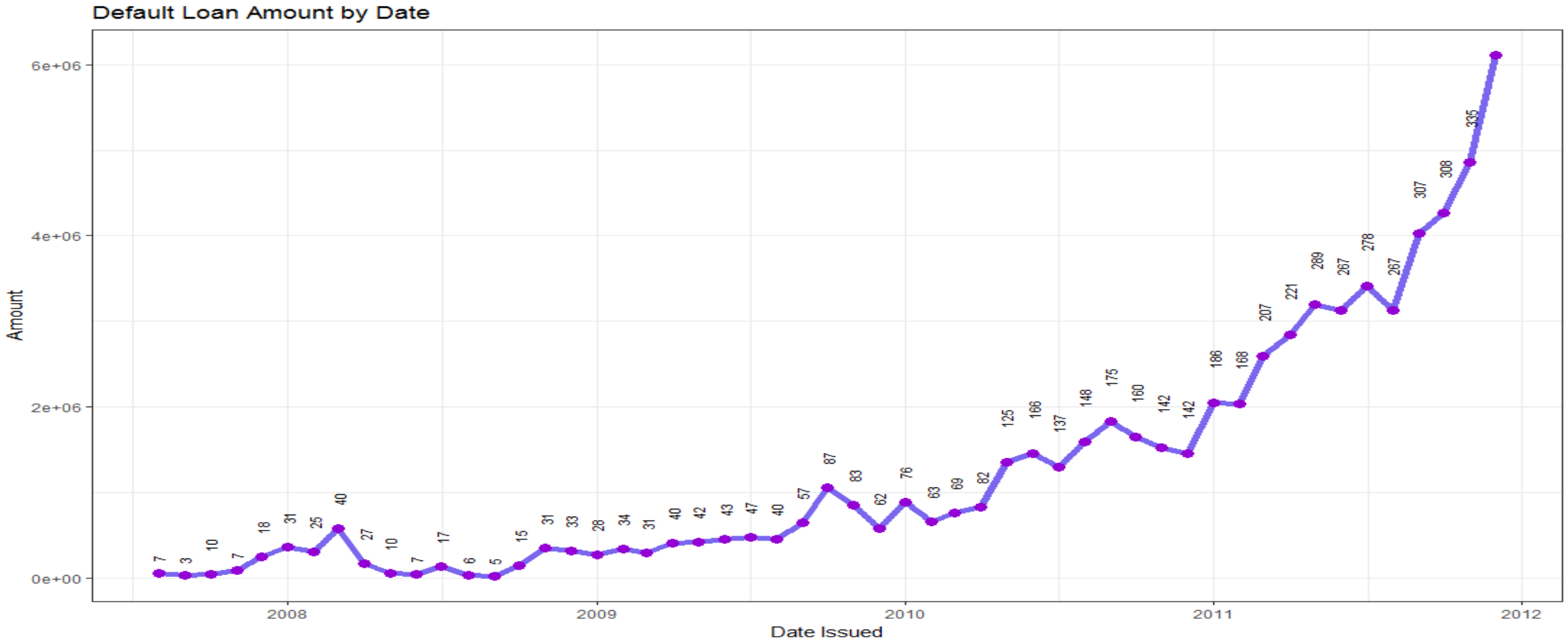
This plot shows the inq_bucket type – wise defaulter loan. Here the number of enquiry is directly proportional with defaulter. The less the number of enquiry, the less is the chance of being defaulter.

DTI Density by Loan Status



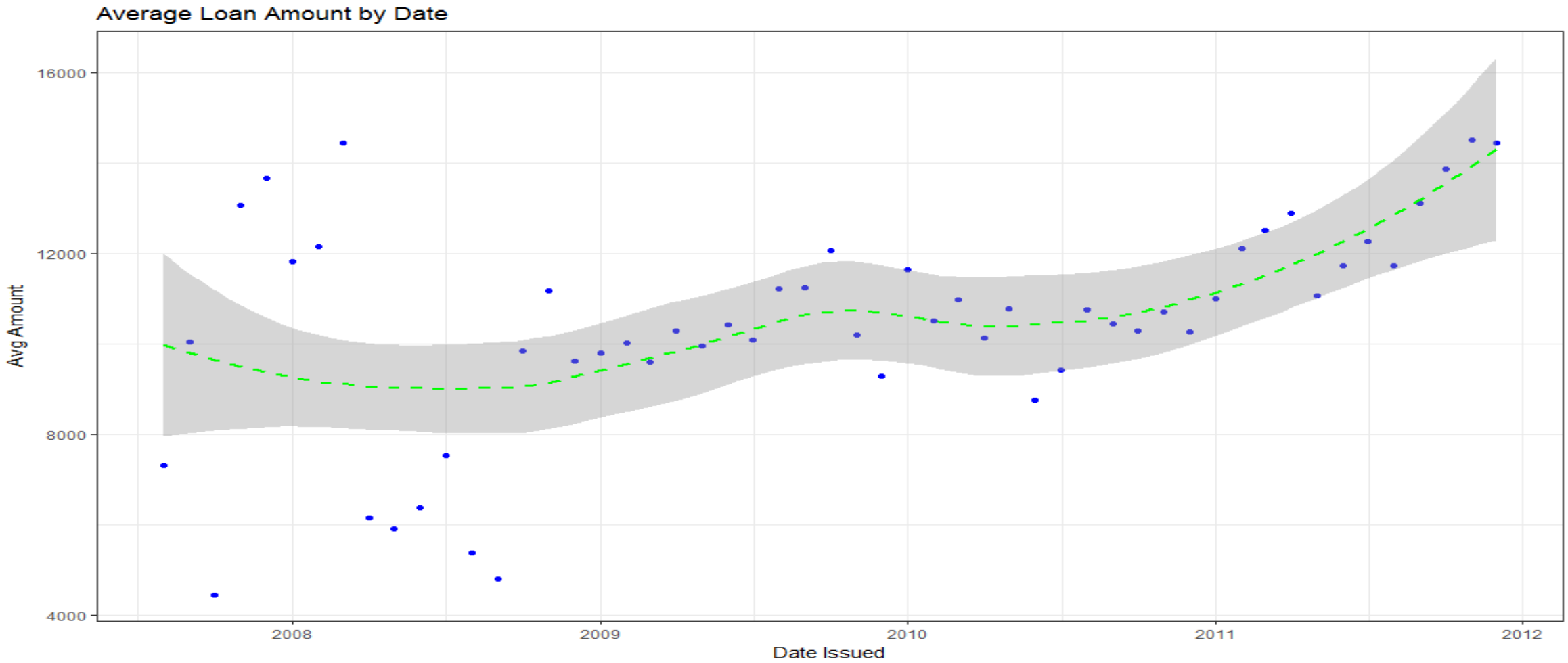
This plot shows the DTI density plot loan status wise. Here we can clearly see lower the DTI means lower risk of being a defaulter.

Loan amount by Year



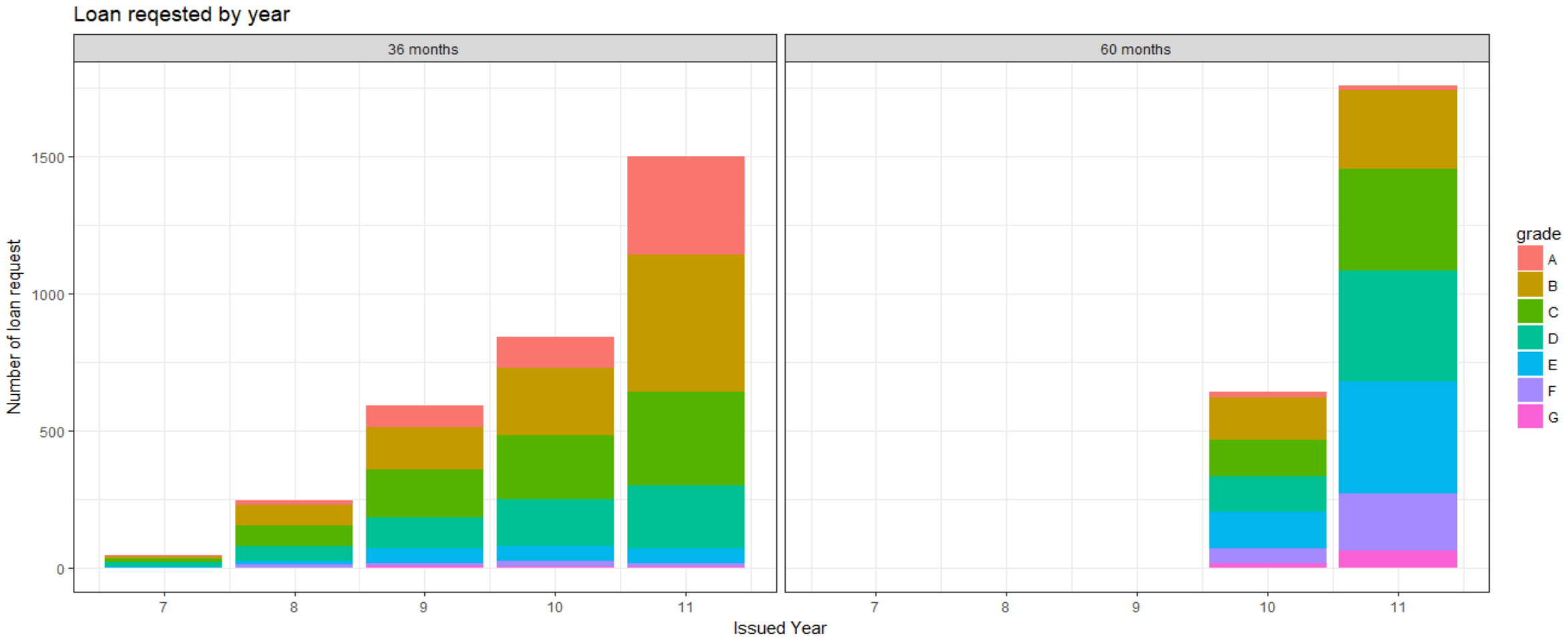
This plot shows the Loan amount year wise. Here the amount of loan increased from 2007 to 2009, with a slight dip after 2009. Later it maintained a steady increasing rate.

Average amount of loan year wise



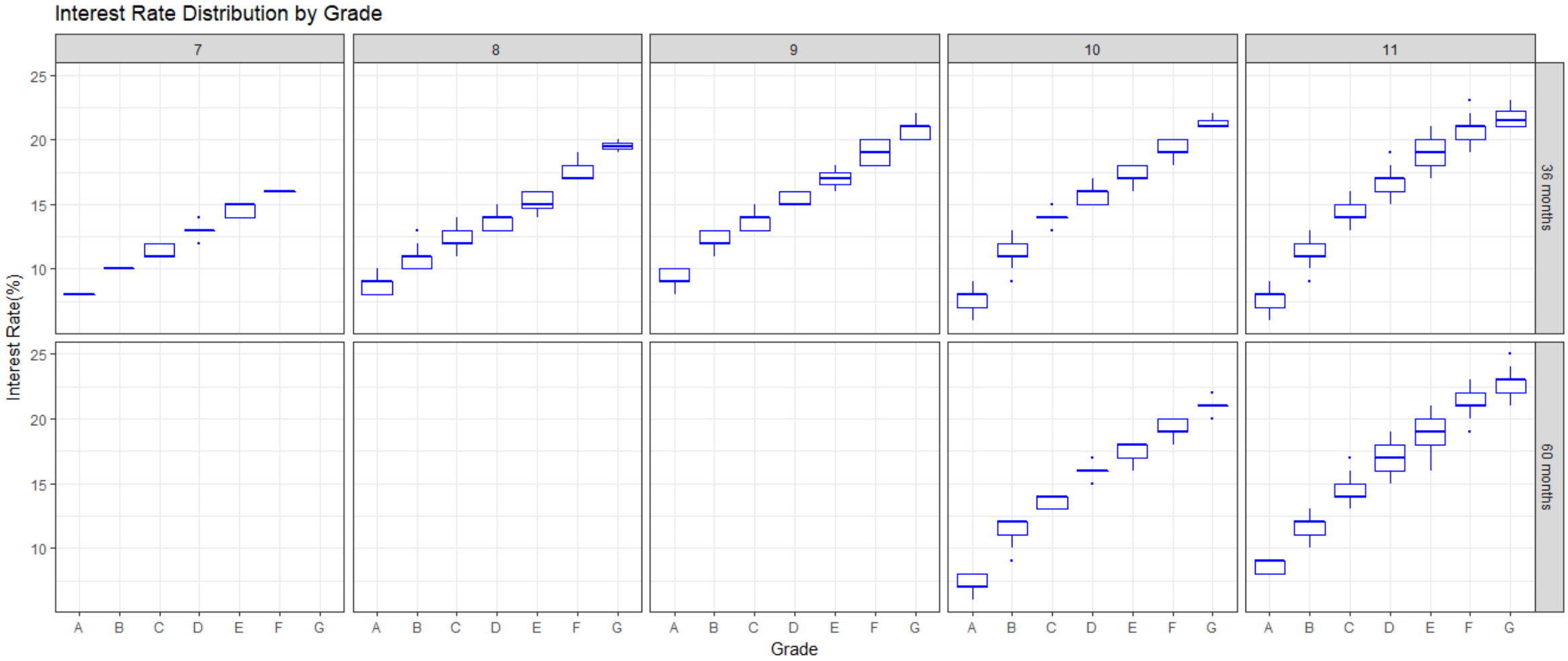
This plot shows the average amount of loan year wise. Here the amount of loan increased at a constant rate from 2007 to 2009 Q2, with a slight dip after 2009. From 2010 to 2011, the average loan amount remained roughly unchanged.

Average number of loan request year wise



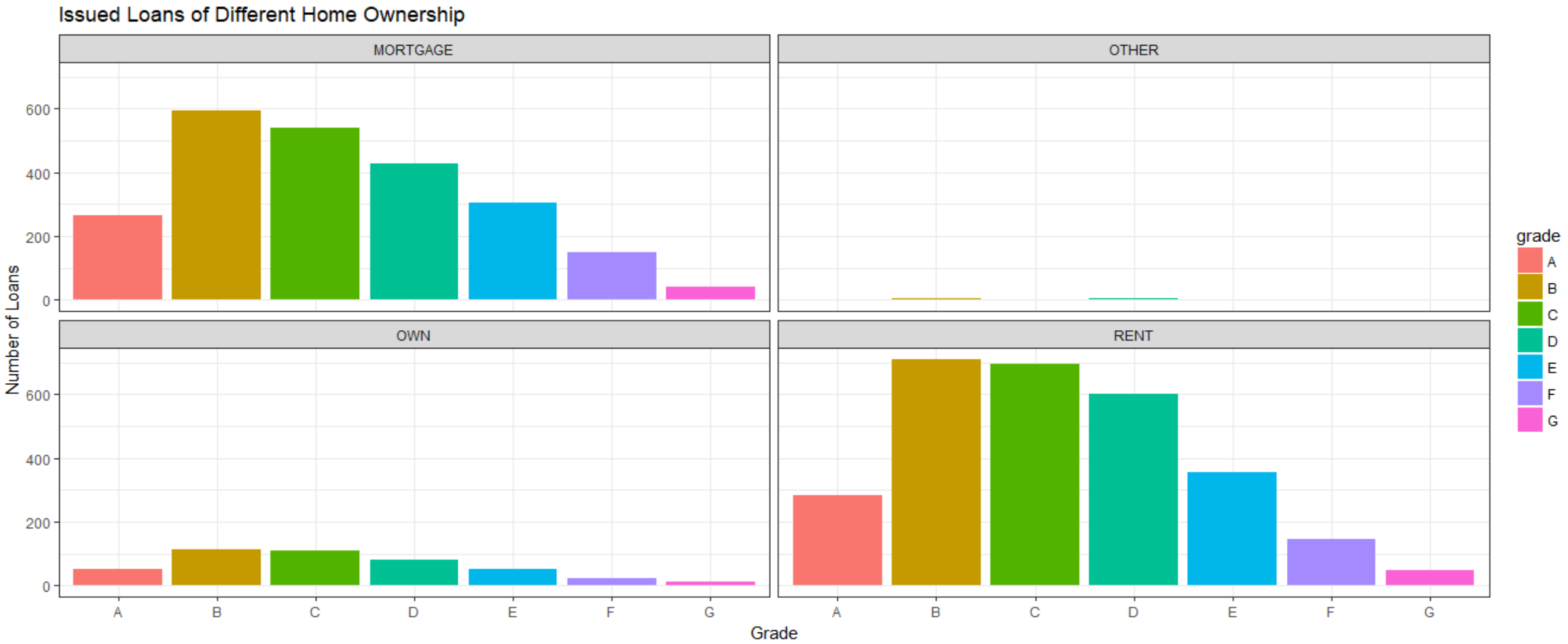
This plot shows the Loan requested year wise. Here the number of 36-month loans is greater than 60-month loans. Also for 36-month loans, the majority of loans are in grade A,B,C and D but for 60-month loans only a small percentage of loans are there in grade A while most of the loans are in grade B,C,D and E.

Grade wise and Year wise Interest rate



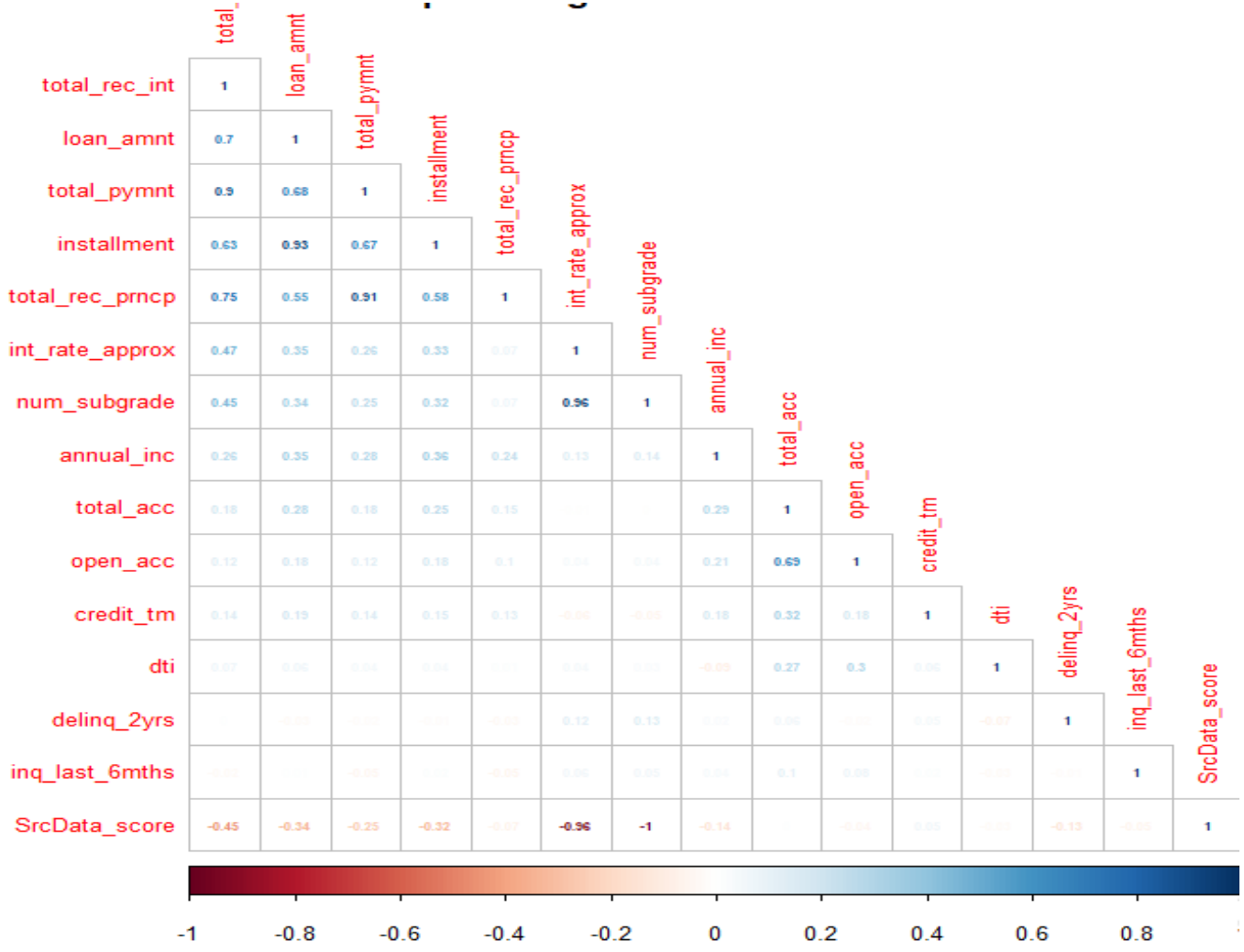
This plot shows the interest rate distribution over the year by grade.

Grade wise and home wise number of loans requested



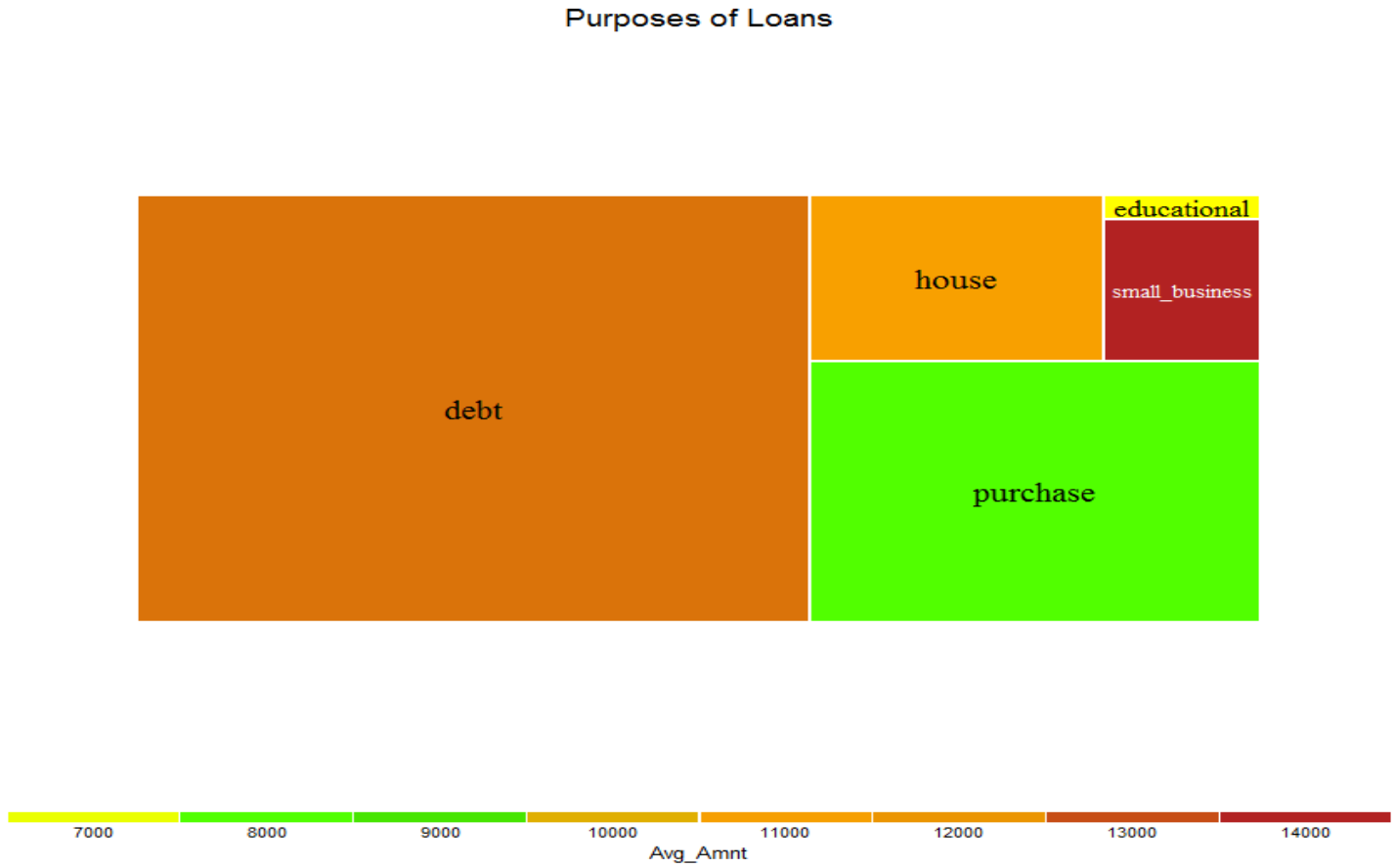
This plot shows the grade, home and number of loan requested. Here we can conclude that loan requestor who is having their OWN house/flat are very unlikely to be a defaulter.

Correlation check between multiple variables



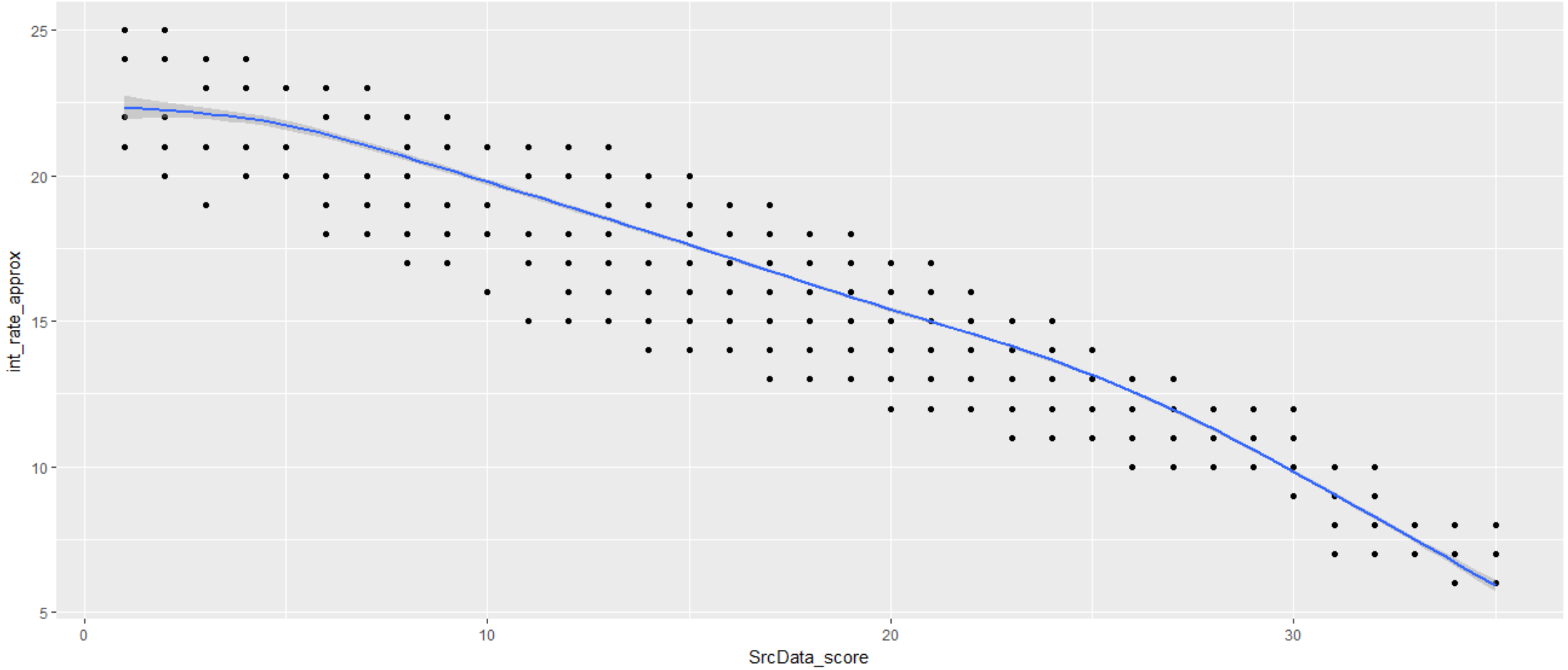
From the correlation check we can see strong relation between Srcdata_score i.e Subgrade rank and interest rate.

Heat Map showing the purposes of loans



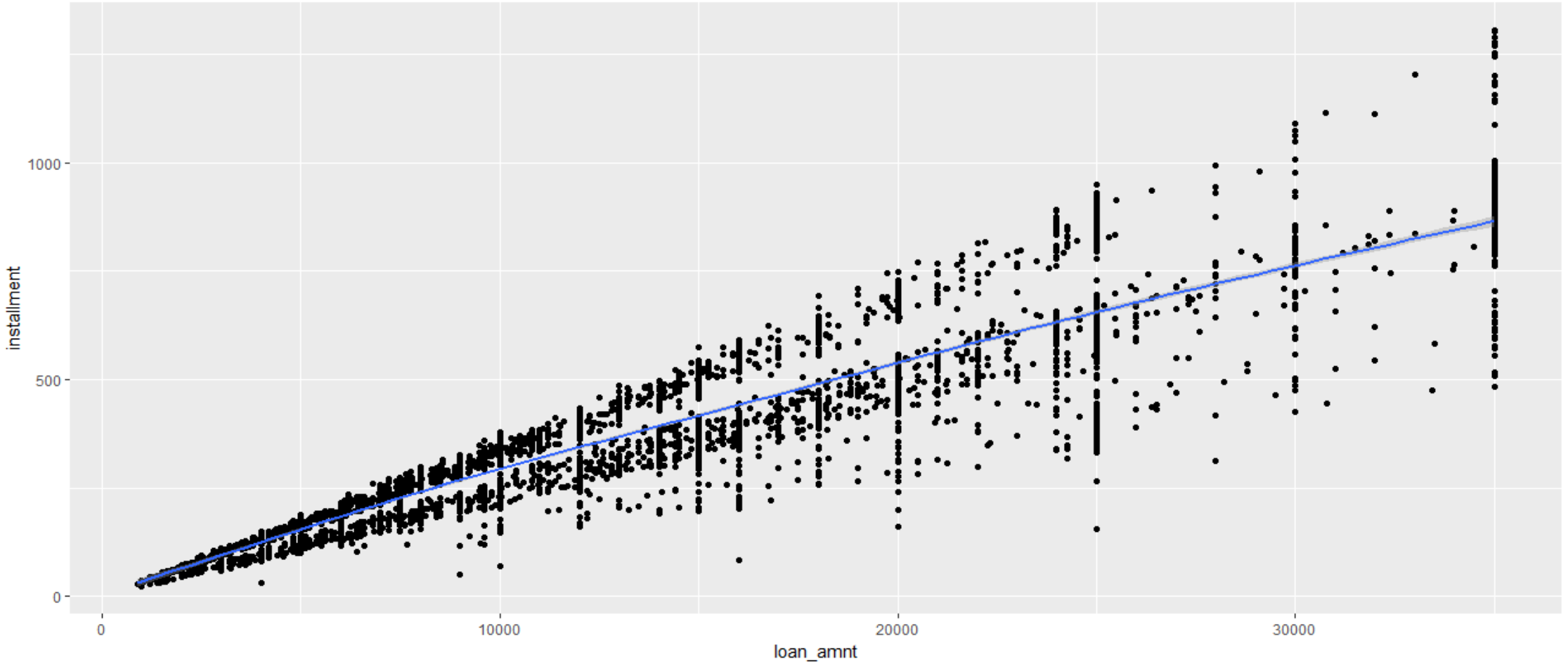
The above plot shows that debt consolidation is the most common reason for borrowing. Most consumers choose to consolidate debt to enjoy lower borrowing costs. Note that there are three variables in the above tree map: purposes, average amount of a loan, and the total volume of loans. It gives us an overall view of the relationship between purposes of loans, the volume and amount of loans. The various sizes in the above tree map are directly proportional to the volume of loans with different purposes.

Relation between interest rate and sub grade



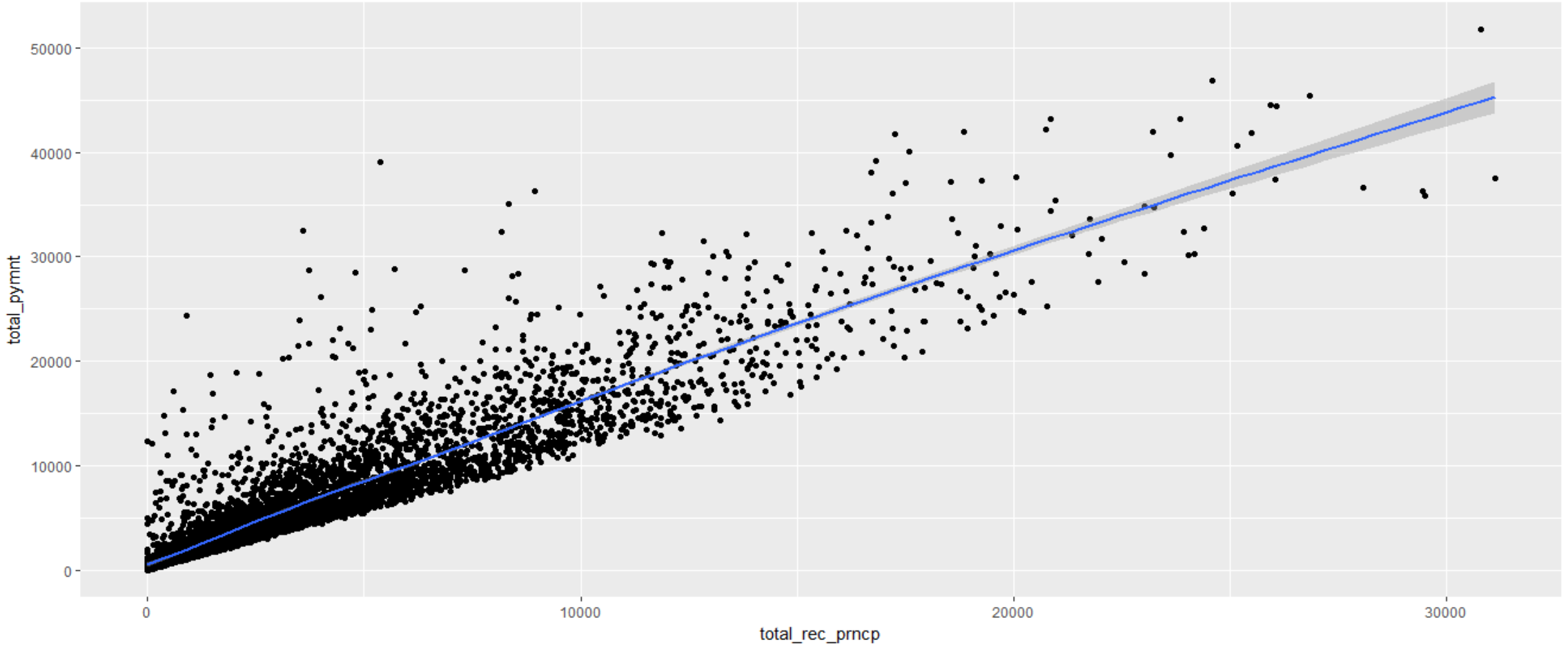
This plot shows there is direct relation between interest rate and sub grade. People on lower grade, subgrade i.e. from A-F tends to look for lower interest rate. But those are very likely to become defaulter as we can see from previous plots.

Relation between installment and loan amount



This plot shows relation between installment and loan amount, and this is pretty obvious that when the loan amount is higher installment would be higher.

Relation between total payment and total recovery principle



This plot shows there is relation between total_rec_prncp and total_pymnt amount. Here we can see more concentration near low value as this is the defaulter data set, which means that less people paid the money.

Recommendations and Conclusion

So as per the overall analysis done and seeing all those visualization we got some of the direct relations or driving variables 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.

Here are some of the recommendations -

1. The number of defaulters are getting increased from Grade A to G. It is advisable to reject loans for grades E,F and G if DBI is not less or reduce the loan amount would lower the risks.
2. Most of the loans are charged off in sub grade F5, Which is very alarming. we can reduce the loan amount or directly reject the loan request.
3. The number of enquiry is directly proportional with defaulter. The less the number of enquiry made by a loan requestor, the less is the chance of being defaulter. We can reject people enquired 7 times or more for loan.
4. Purpose of loan is also very related with charged off or defaulter. We have to be more careful before loan sanction for 'Small Business'. Perhaps we can increase the interest rate for small business.
5. Debit to income ratio, in case of higher DTI we can eject the loan to lower the risks of loosing money.
6. In case of loan requestor having Own house/property, give them priority to provide loan as they are very unlikely to being defaulter.


THANK YOU