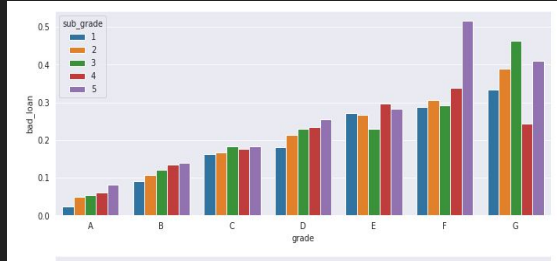
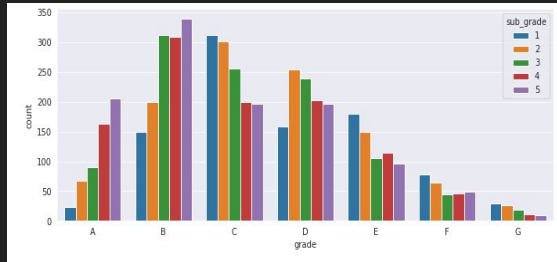


# Lending Club Case Study

A case study to minimise the risk of losing money while lending to customers.

By Harpreet Singh & Siddhant Shrivastav

Number of Charged off loans(Sub Graph)

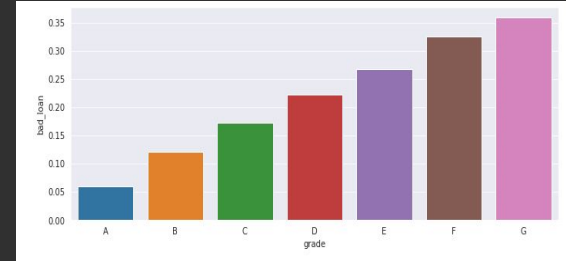
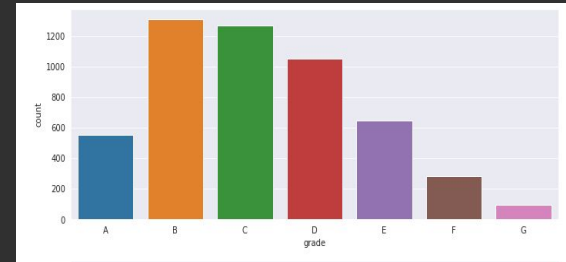


Probability of getting charged off(Sub Graph)

Probability of getting charged off is higher in grade G loans whereas as we can see most number of loan which got charged off are in grade B.

Another thing to notice that grade G loans are taken up way less than other grades.

Number of Charged off loans(Graph)

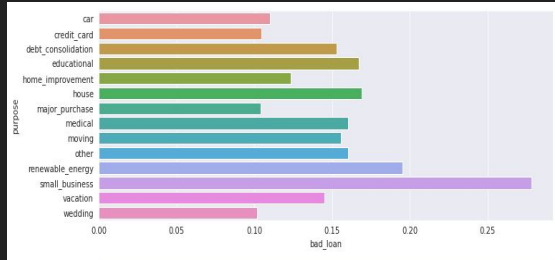
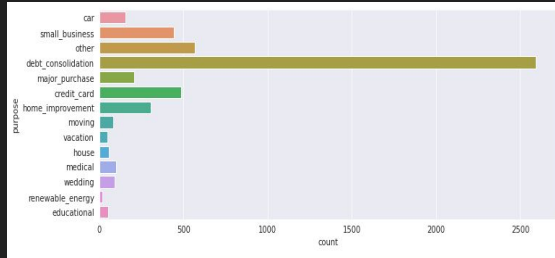


Probability of getting charged off(Graph)

Similarly we can see the same with sub grade aslo, F1 have highest probability to charged off whereas B5 has most charged off loans.

## Loan Grade and Subgrade

Number of Charged off loans(Purpose)

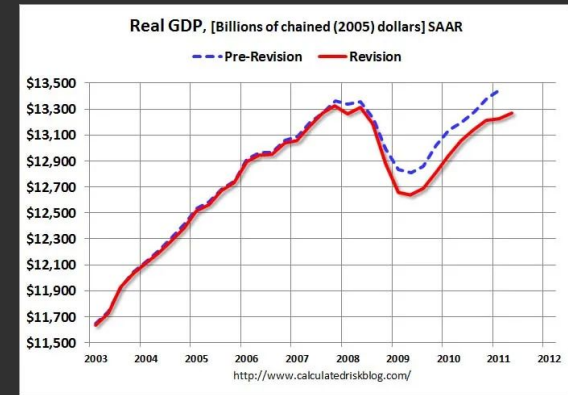
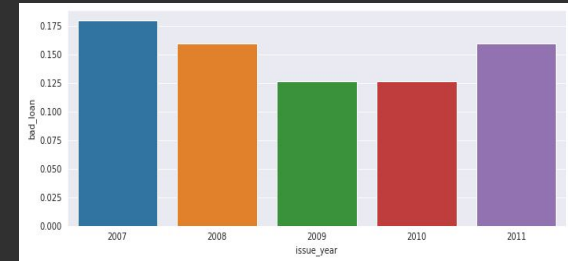


Probability of getting charged off(Purpose)

## Loan Purpose

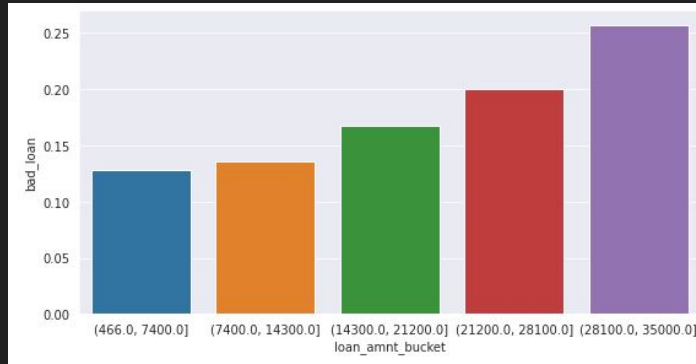
We can see that small\_buisness purpose have highest probability to get charged off whereas people requests more loan on debt consolidation.

Issue Year / Great Recession

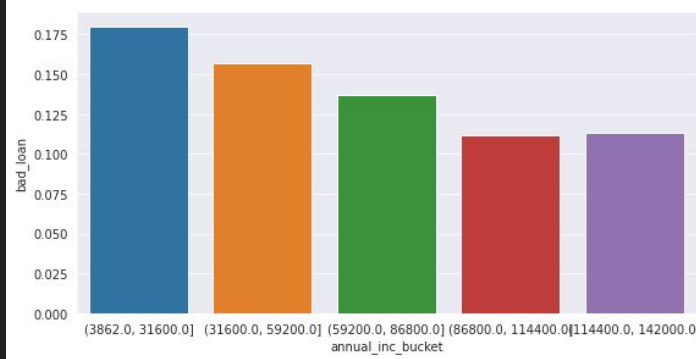
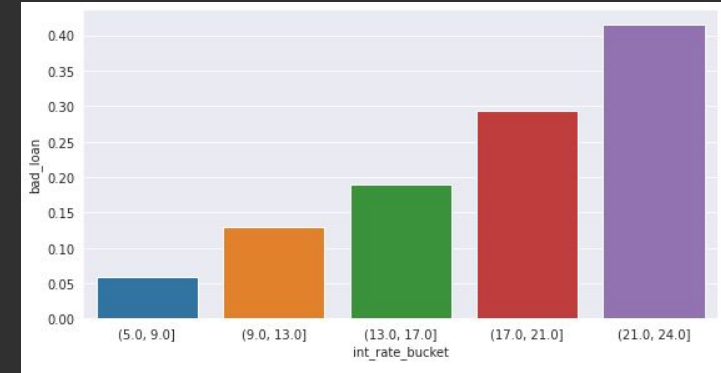


We can see that probability rate to default follow great recession GDP for Issue Year

Probability of Charged off loans(Loan Amount)



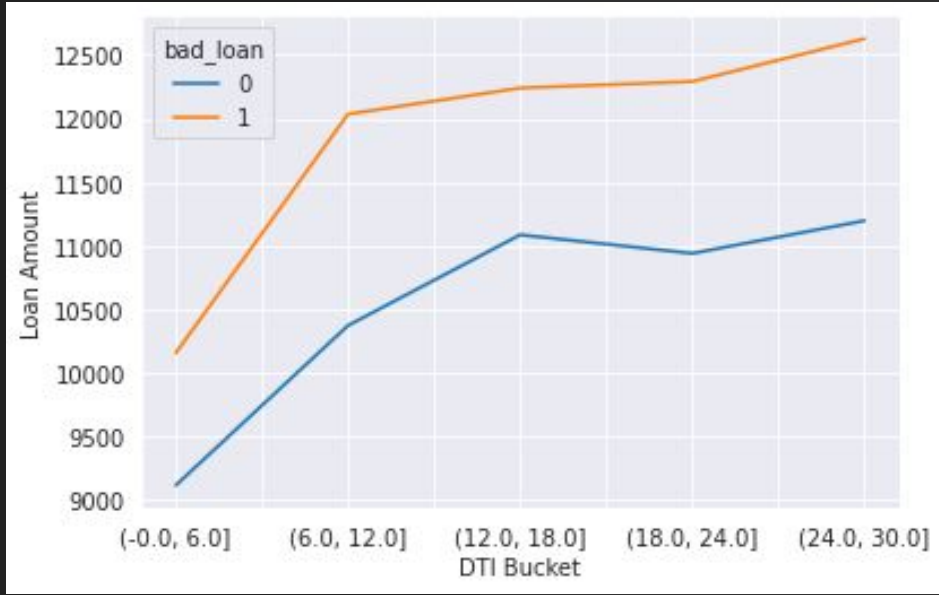
Probability of Charged off loans(Interest Rate)



Probability of Charged off loans(Annual Inc)

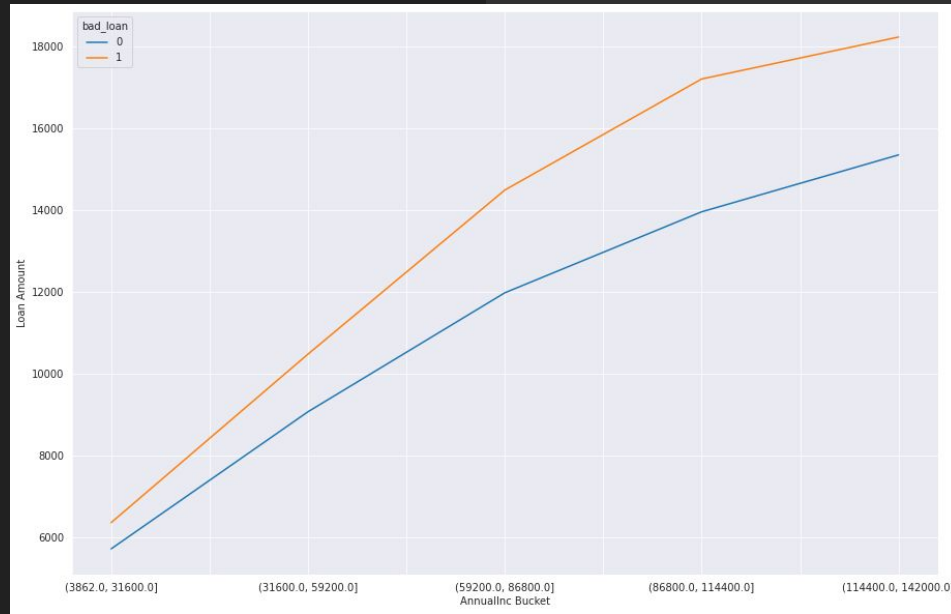
## Loan Amount, Interest Rate and Annual income

Loan Default probability increases as loan amount and interest rate increases whereas probability of getting charged off is more with lower annual income



## DTI vs Loan Amount

Orange line plots charged off entries, we can see clearly here that higher loan amount was given to people with lower dti.

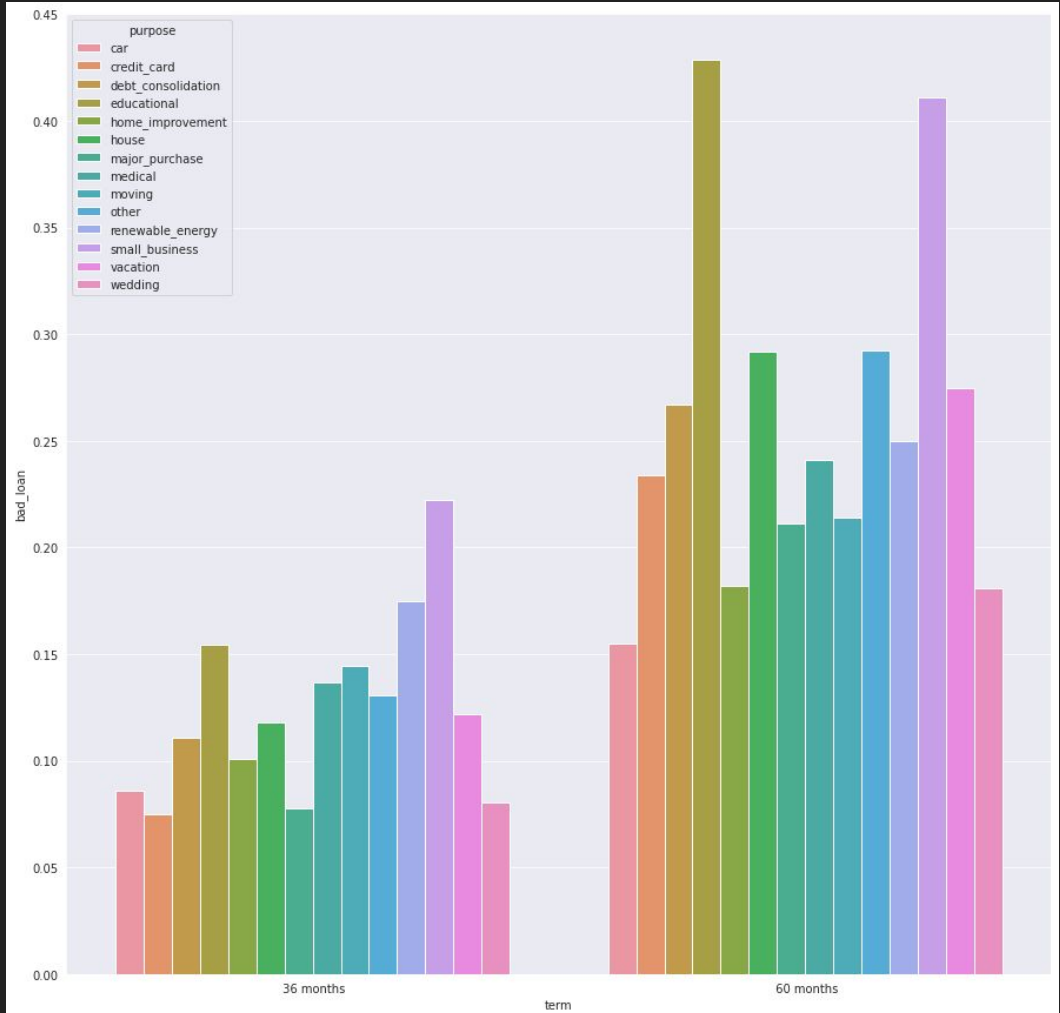


## Annual Income Bucket vs Loan Amount

We can see here that higher loan amount was given to people with lower annual inc than fully paid entries.

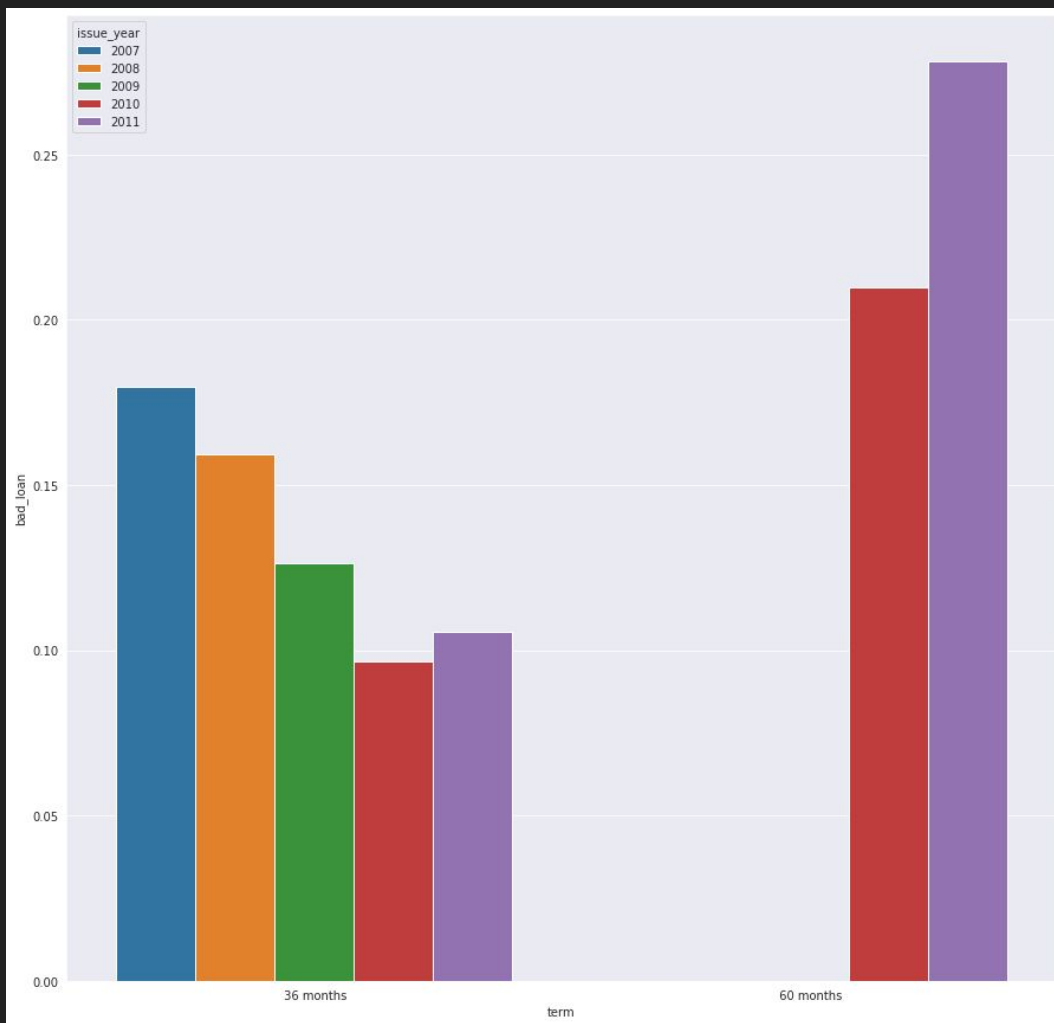
## Purpose based on term

We can see here that in 60 months we have more probability of finding charged off when purpose is for educational which is around 42.5% whereas in 36 months small business 22.5% have high probability.



## Issue year based on term

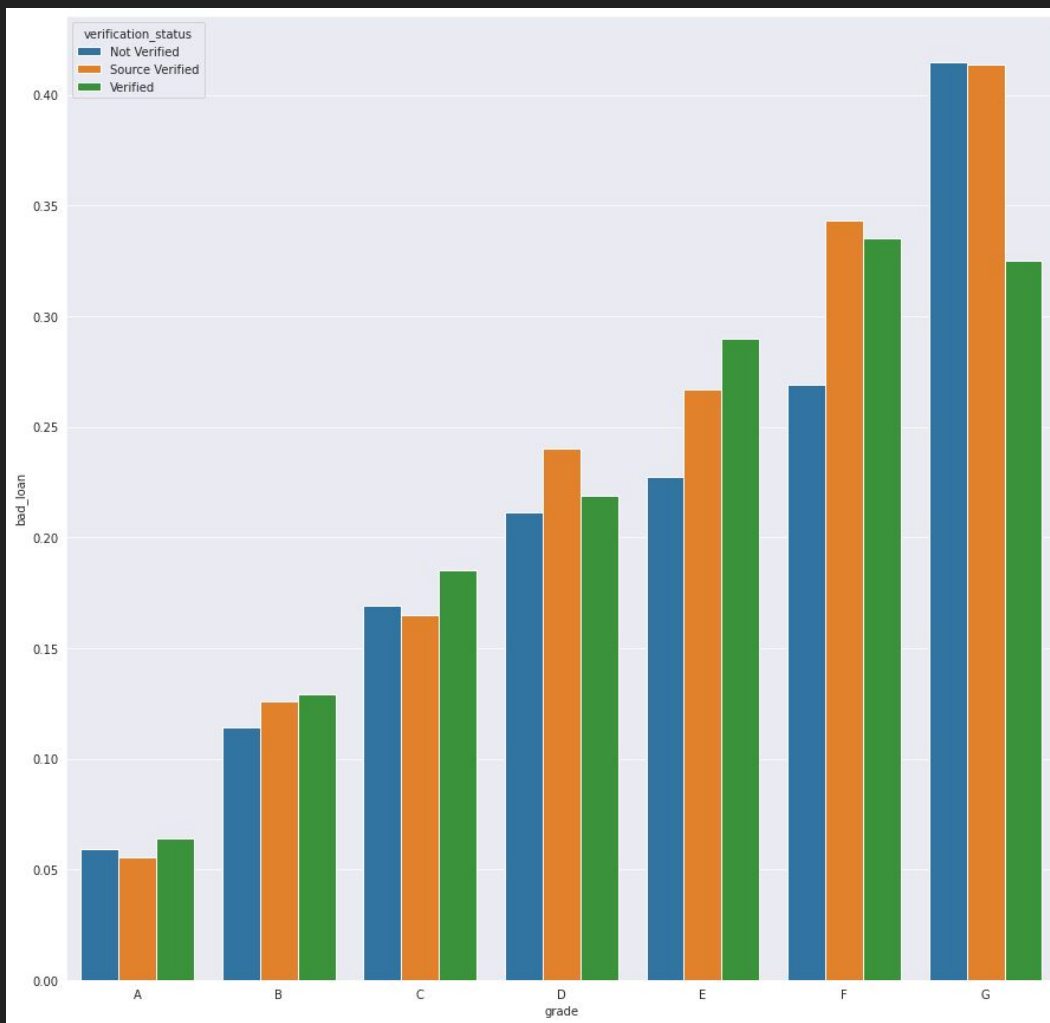
This is general observation that during the great recession of 2008 there were no entries for 60 months during 2007 to 2009.





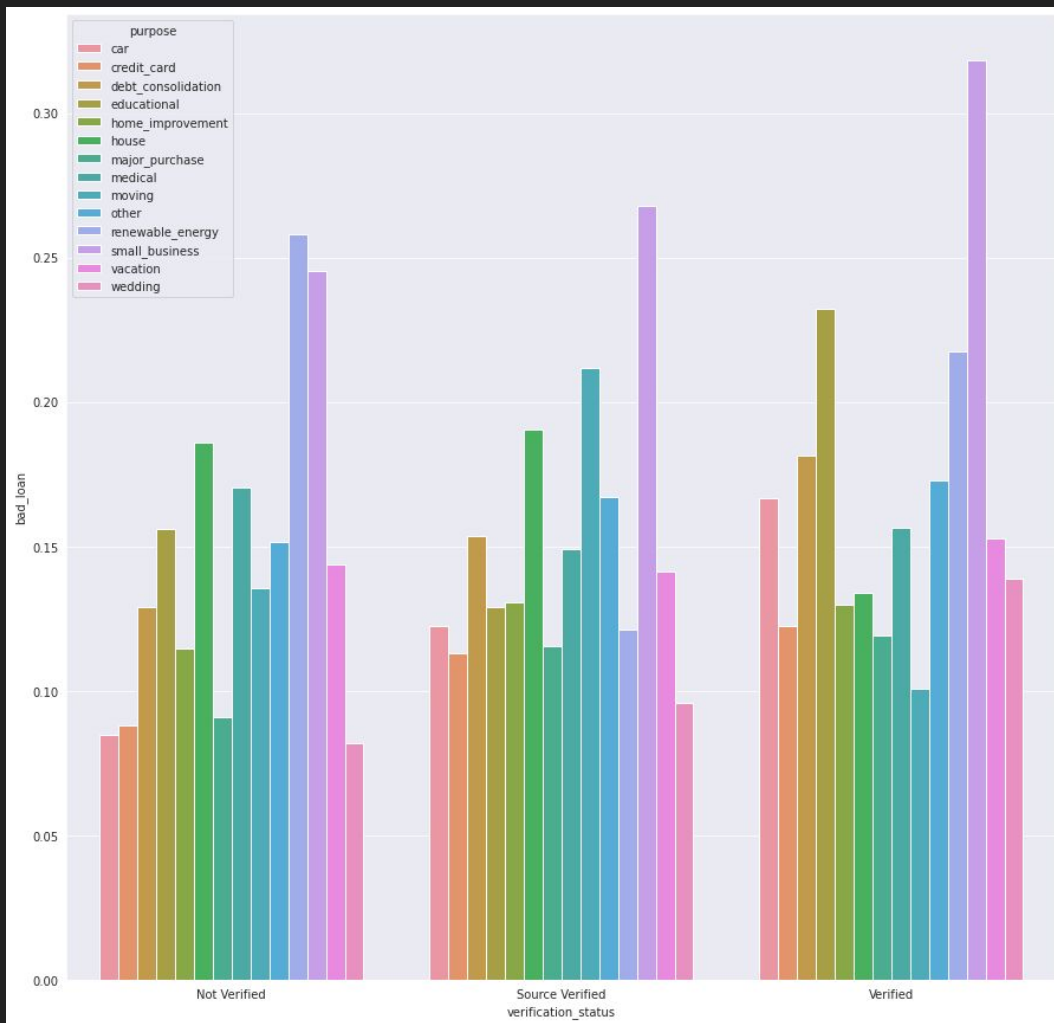
## Verification status based on grade

Grade G, is the grade with highest interest rate but we can see that it has been to people who are not verified, where around 42% loan gets charged off.



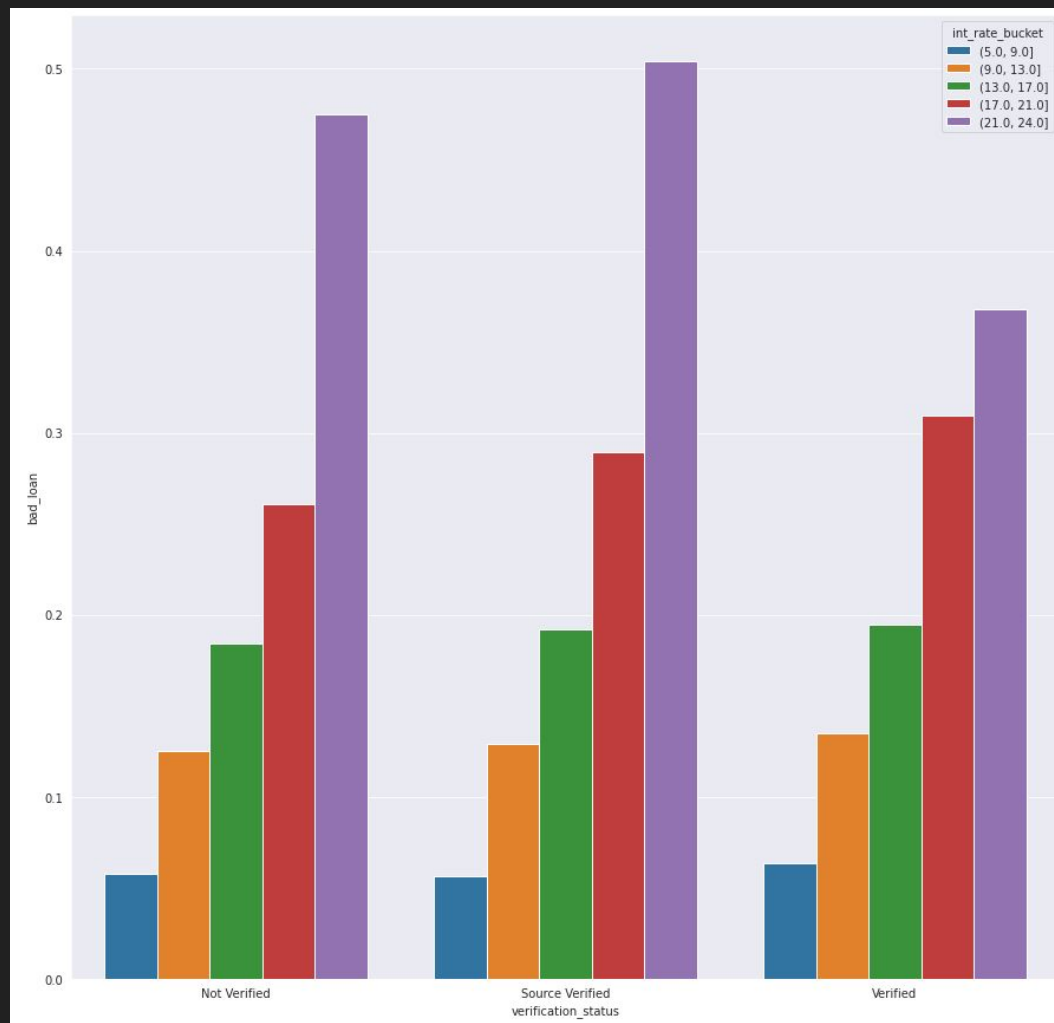
# Verification status based on purpose

We can see loan were given for purpose “small business”, but we never verified the source of income. We see around 25% of loan get charged off in case of “Not Verified for small business”.



# Verification status based on interest rate

Highest bracket of interest Rate were given to “Not Verified” loanee, which can be prevented from charged off.



# Observation

- Bad loan increase as we go down grade where A is highest and G is lowest.
- Sub grade, for E, F and G we don't see same pattern than A ,B, C and D grades.
- For purpose, small business have highest probability to get defaulted.
- Issue year follows the GDP trend during Great Recession 2008.
- Loan default probability get increases as we increase loan\_amnt and int\_rate.
- But Loan Default probability get decrease as we increase annual income.

# Recommendations

We can detect bad loans,

- Higher amount of loan were given to people, with less DTI.
- Similarly, Higher amount of loan given to people with lower annual income bracket.
- Grade G, is the grade with highest interest rate but we can see that it has been loaned to people who are not verified, where around 42% loan gets charged off.
- Don't provide loan for small\_buisness unless they get verified. There is 42% probability that loan get charged off if it is provided for small business without verification
- Highest bracket of interest Rate were given to "Not Verified" borrower, which can be prevented from charged off.