Lending Club Case Study

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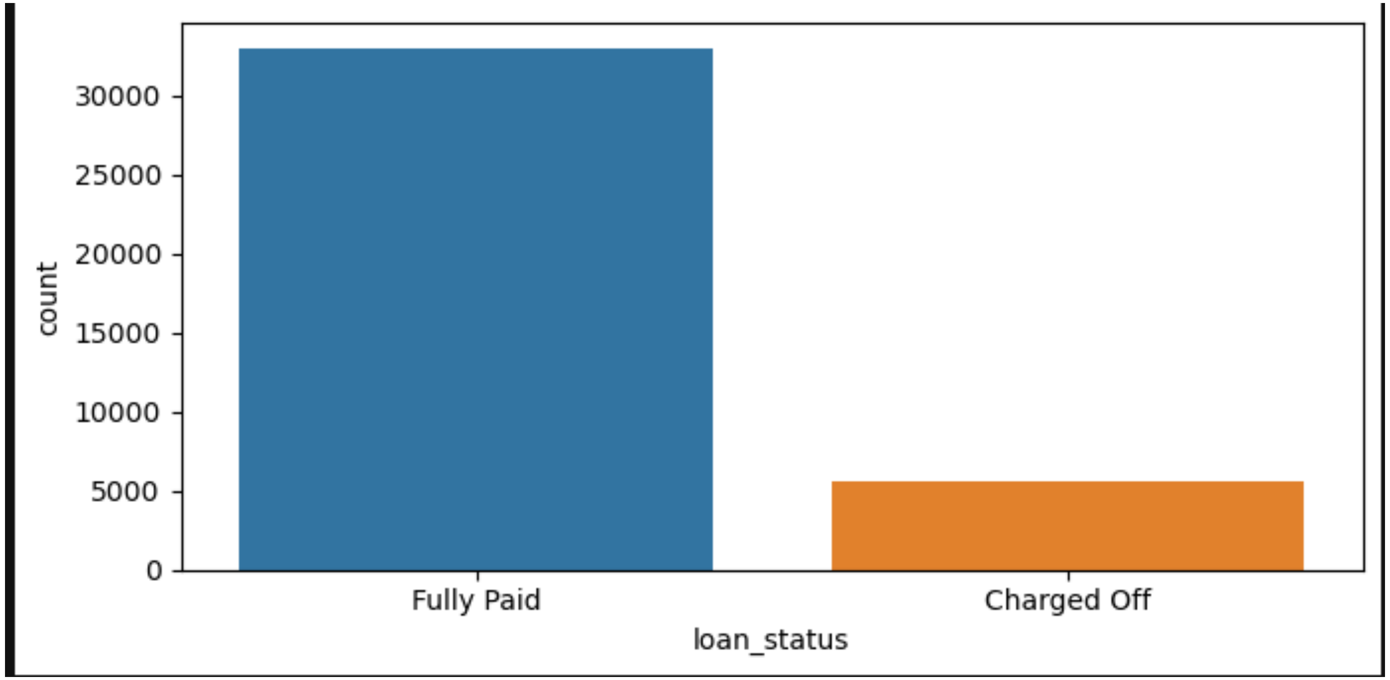
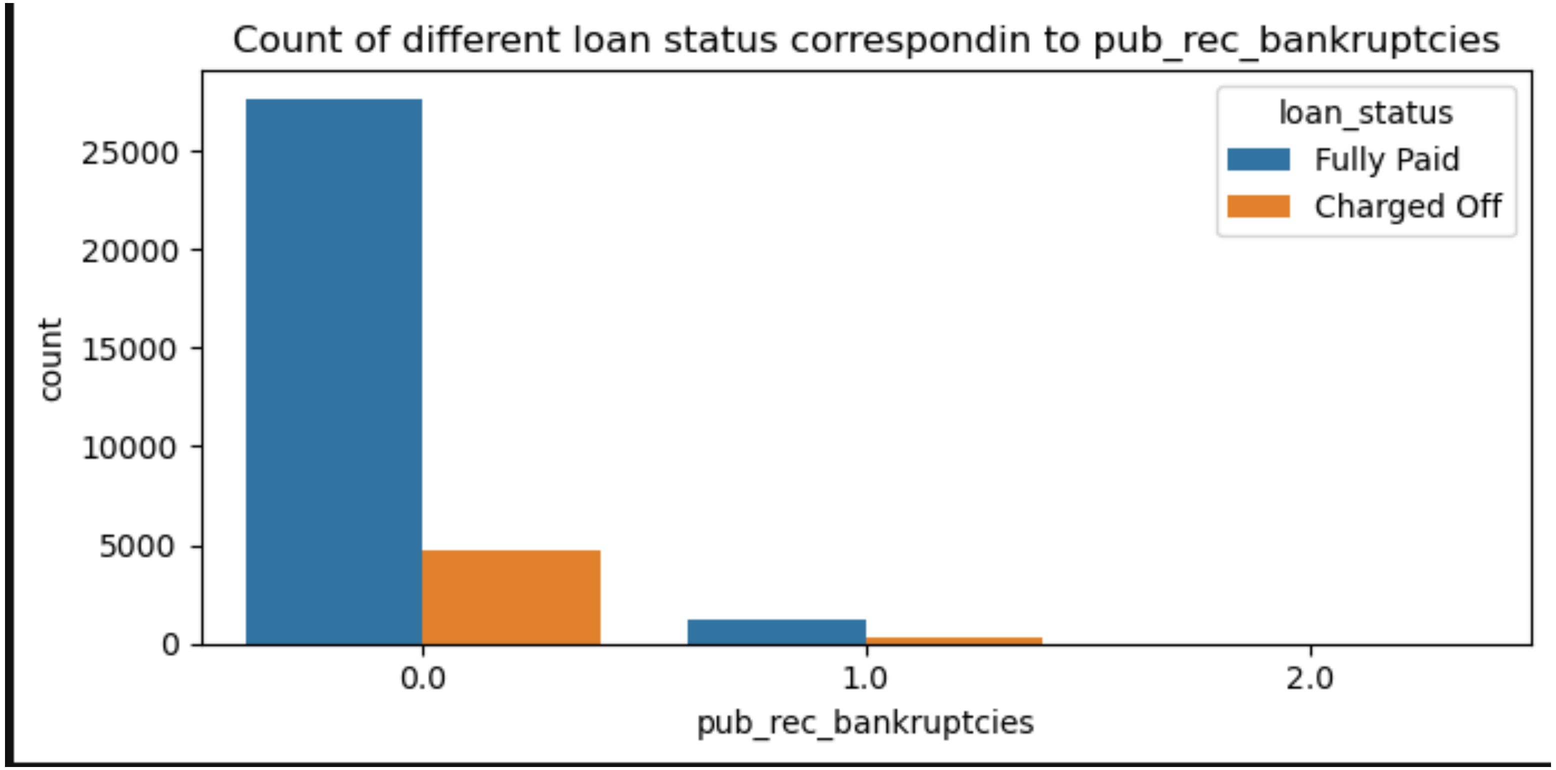
Loan Status (Target feature) division



This graph shows the number of loans that were fully paid (around 35000) and count of loans that were charged off (around 6000)

Public record bankruptcies

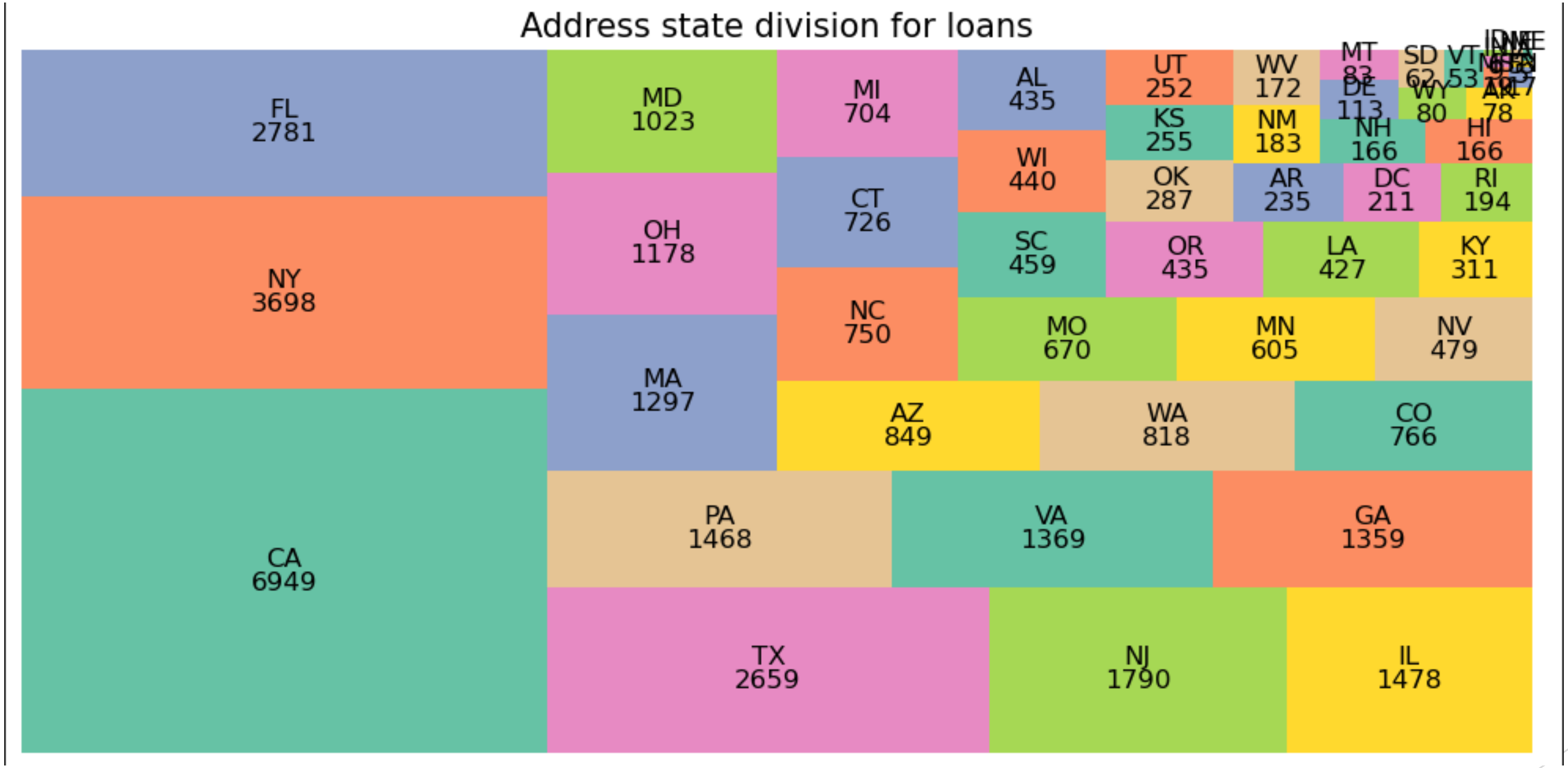


Percentage of charged off loans for borrowers with 0 pub_rec_bankruptcies is: 14.2%
Percentage of charged off loans for borrowers with 1 pub_rec_bankruptcies is: 22.3%
Percentage of charged off loans for borrowers with 2 pub_rec_bankruptcies is: 40.0%

Recommendation on Public record bankruptcies

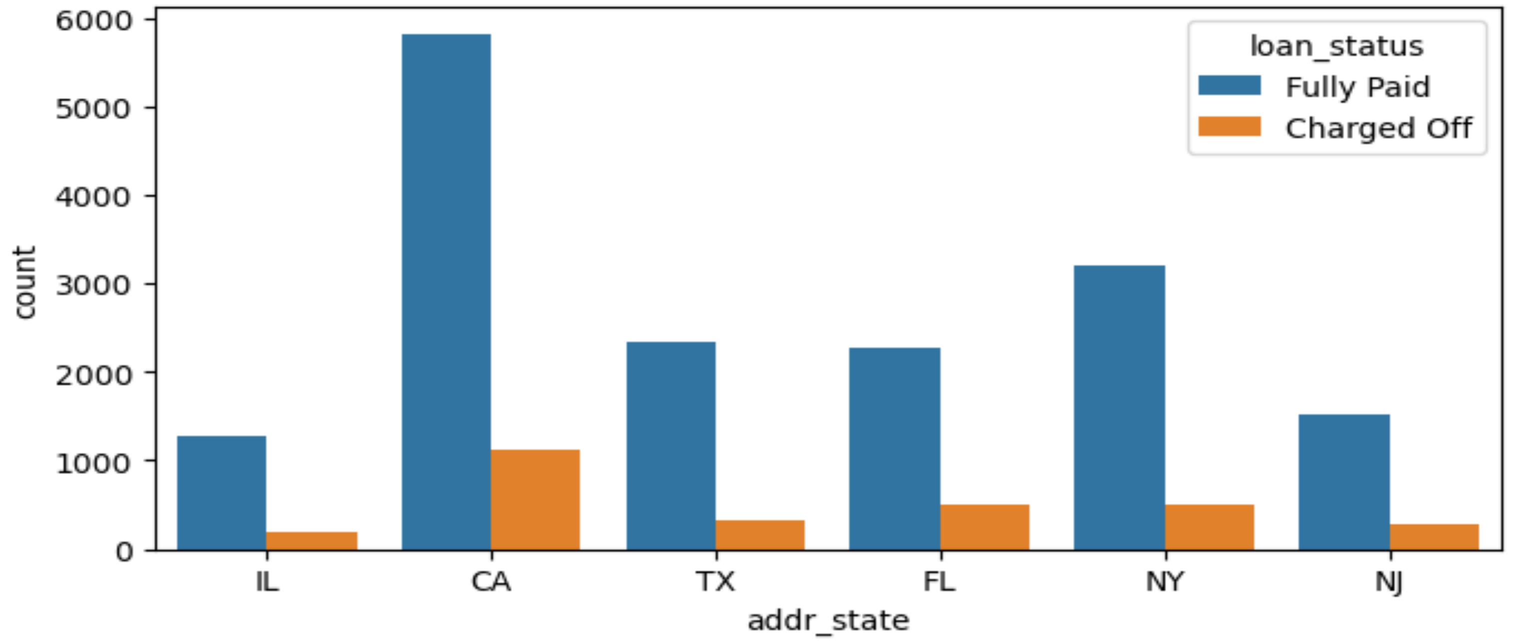
- As the charged off loans percentage increases around 8% when pub_rec_bankruptcies were 1 and reached around 40% when number of pub_rec_bankruptcies equals 2, hence investors should be more cautious in giving loans to the borrowers with more pub_rec_bankruptcies.

Address State distribution



Looking at above tree map, 50% of the total customers come from CA,NY,FL,TX,NJ and IL.

Top 6 States with loan status

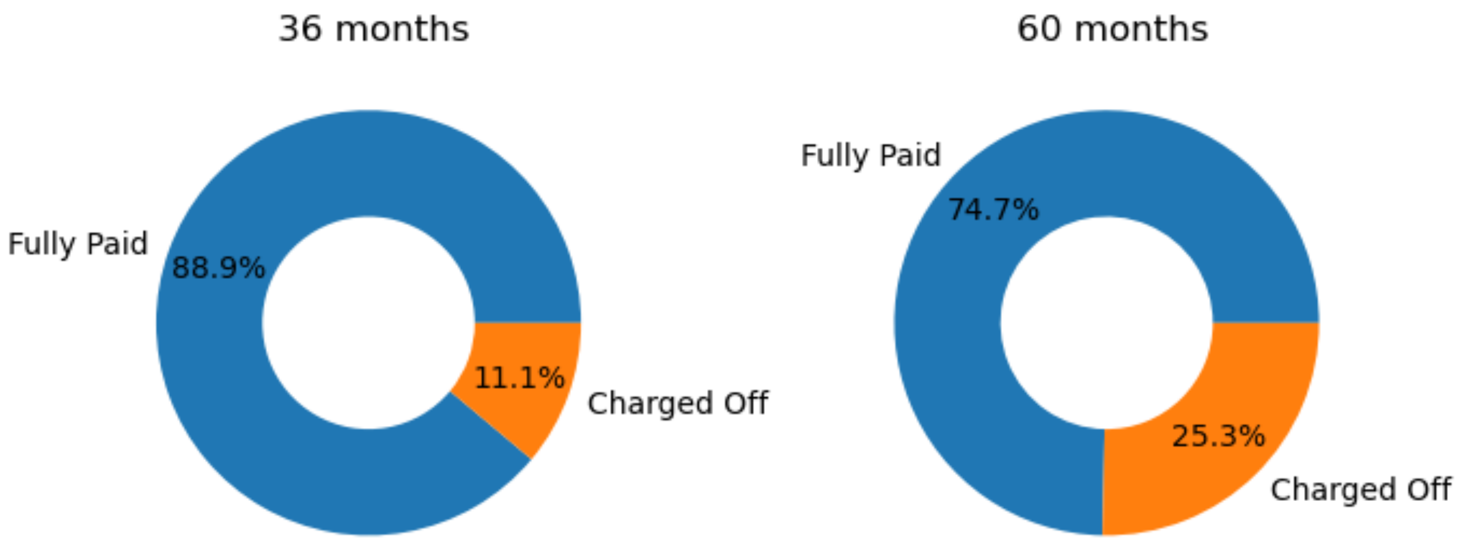


state is: CA and percentage of fully paid loans is 83.81%
state is: NY and percentage of fully paid loans is 86.61%
state is: FL and percentage of fully paid loans is 81.87%
state is: TX and percentage of fully paid loans is 88.11%
state is: NJ and percentage of fully paid loans is 84.46%
state is: IL and percentage of fully paid loans is 86.67%

Recommendations on address states

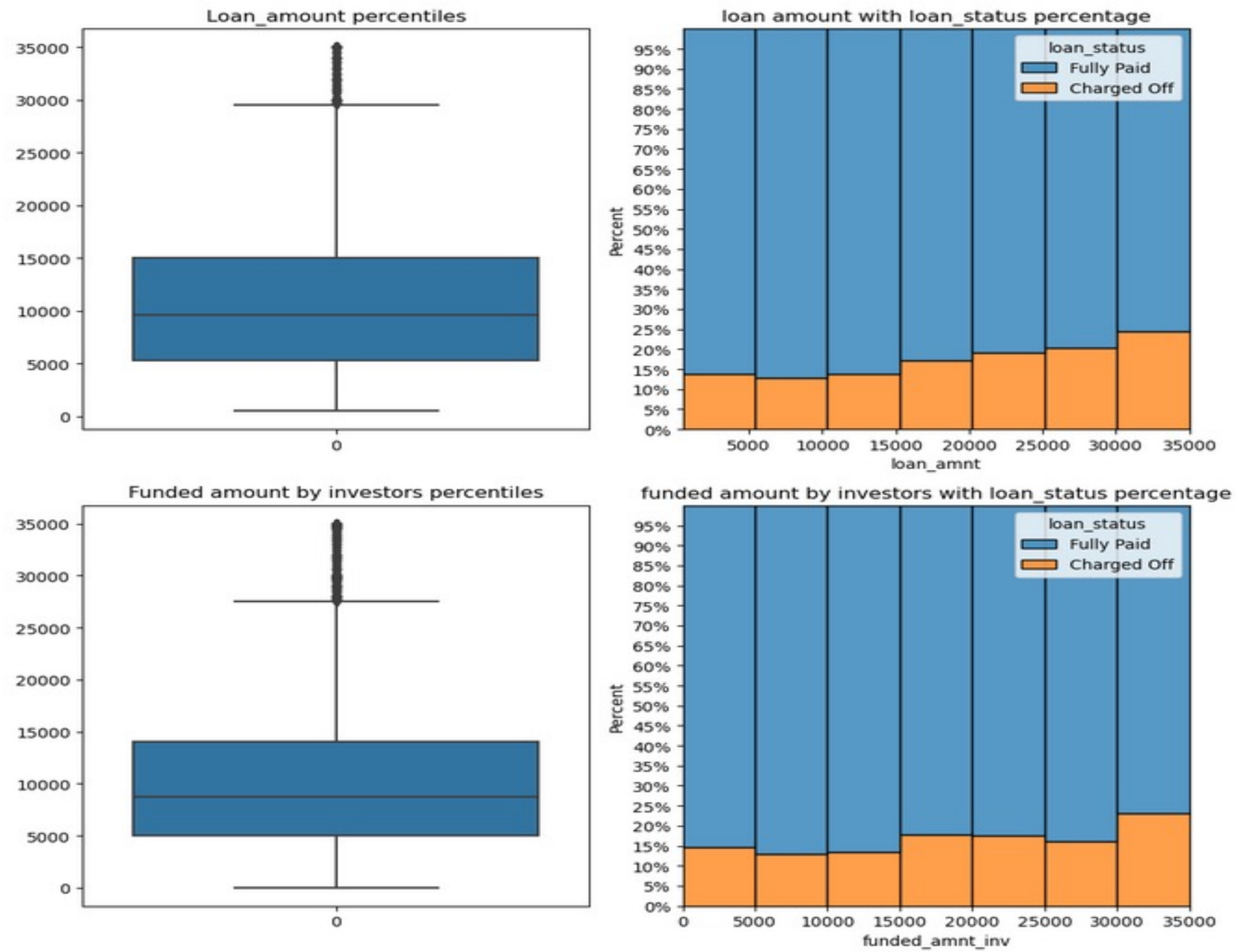
- The states does not make much difference in customers fully paying their loans. But, company can be bit more careful in examining customers in FL state as the percentage is lowest there and can ease out the process a bit in TX state as percentage is highest there.

Terms analysis with loan Status



88.9% of the 3 year loans are fully paid and 74.9% of the 5 year loans are fully paid. Hence, there company should focus more on verifying loans that are being taken for 5 years period as they tend to default more.

Home ownership feature analysis



Recommendations from Home ownership analysis

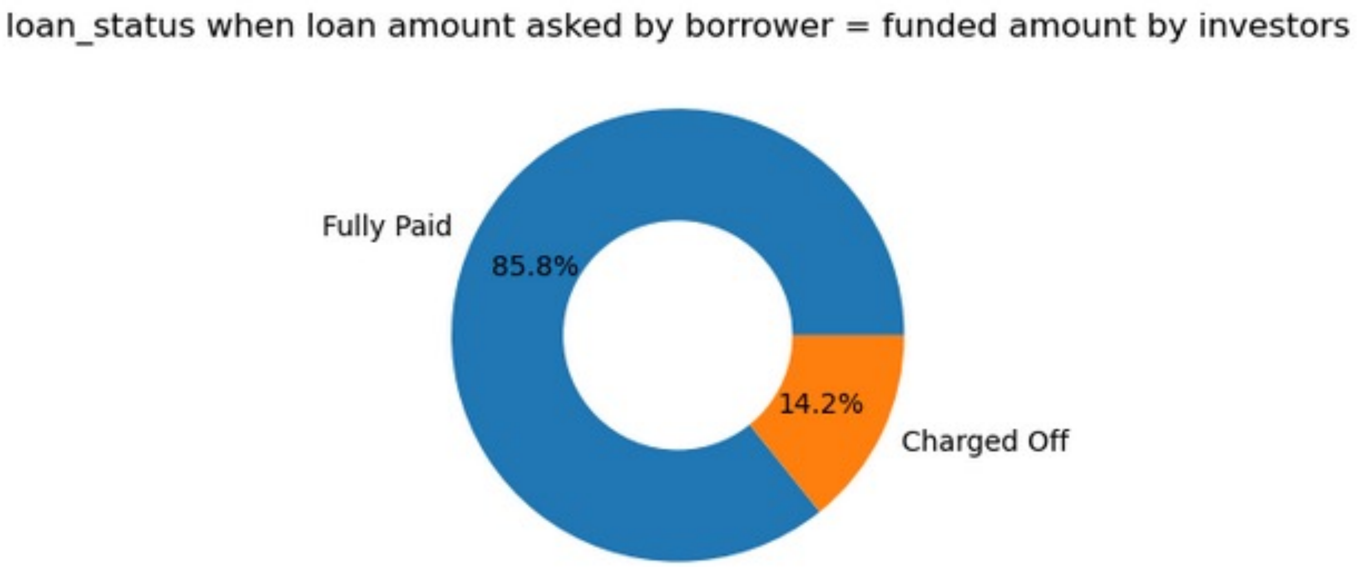
1. Looking at figure 1, loan amount box-plot, the 25 percentile and 75 percentile is 5,000 and 15,000 respectively and mean is 10,000.
2. Figure 2 shows histogram for all percentage of loans that were "fully-paid" and "charged_off" for specific loan_amount. Percentage is around 15% till loan amount of 15,000 but the charged off percentage is incrementing regularly as the loan_amount increases beyond 15,000. Hence, company can make stricter rules for new customers asking for loans beyond 15,000.
3. For loan amount funded by investors, funded amount by investors beyond 15,000 have around 3-7% of higher risk of getting default.For funded amount by investors above 30,000, the charged off percentage increases drastically. Hence investors should focus more on giving loans above 30,000.

New columns

- Created 2 new columns named LCvsInv and LoanvsInv.

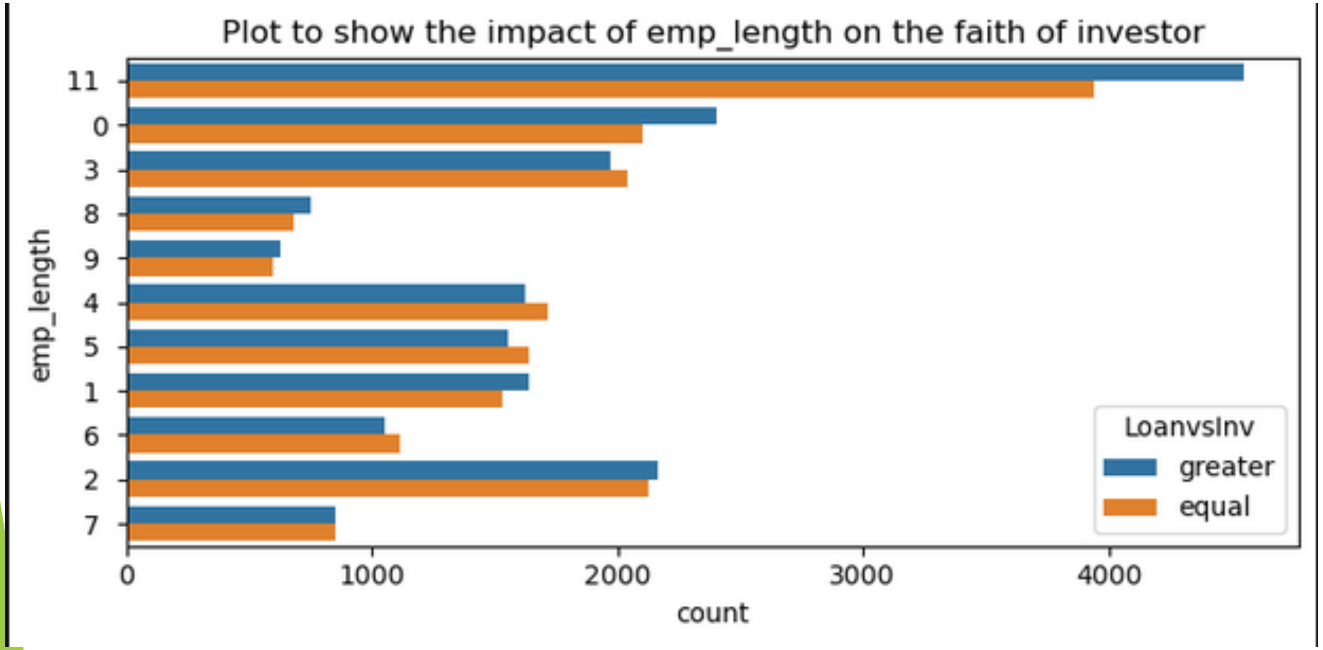
1. LCvsInv: Provides 2 values. "equal" if the funded_amnt = funded_amnt_inv and "greater" if funded_amnt > funded_amnt_inv
2. LoanvsInv: Provides 2 values. "equal" if the loan_amnt = funded_amnt_inv and "greater" if loan_amnt > funded_amnt_inv. "equal" value signifies that the investor trusts the borrower that they will pay out the loan successfully.

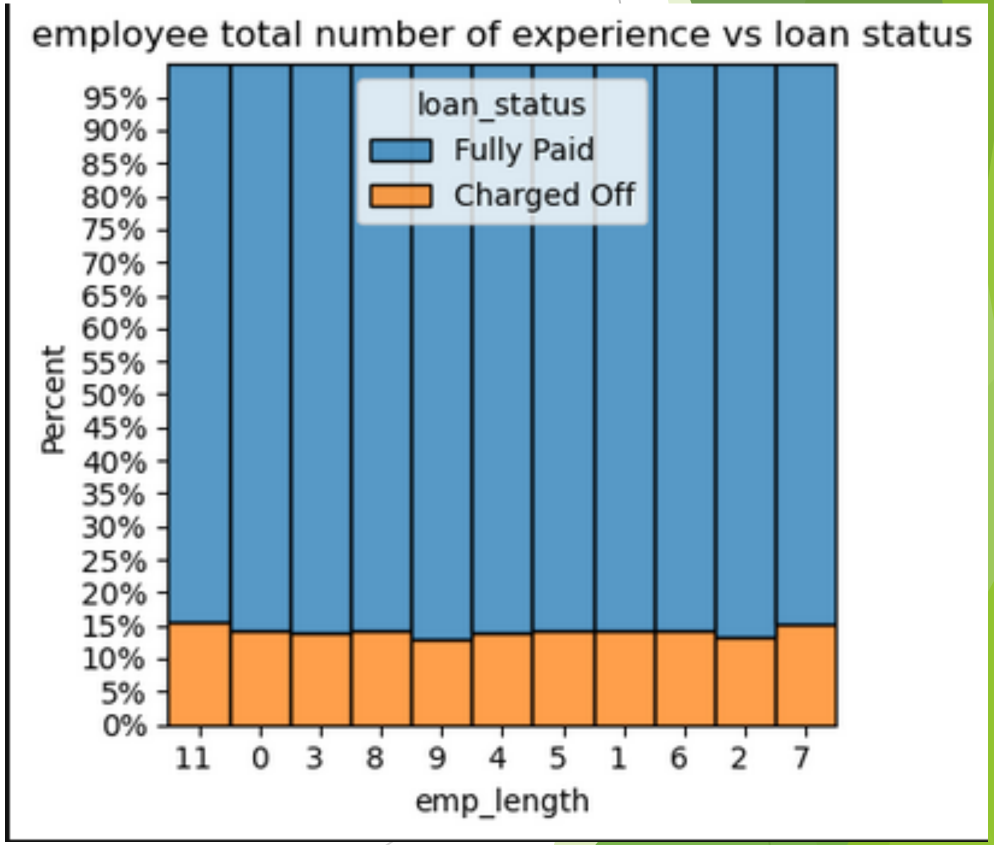
Loan amount vs Funded amount by investors



This suggests that whenever investors have full faith on LC, 85.7% of the times, the loans are fully paid and whenever investors have full faith on borrower, 85.8% of the times, the loans are fully paid.
Now we need to see what factors are causing investors to believe the borrower completely.

Employee experience impact on faith of investor w.r.t borrower

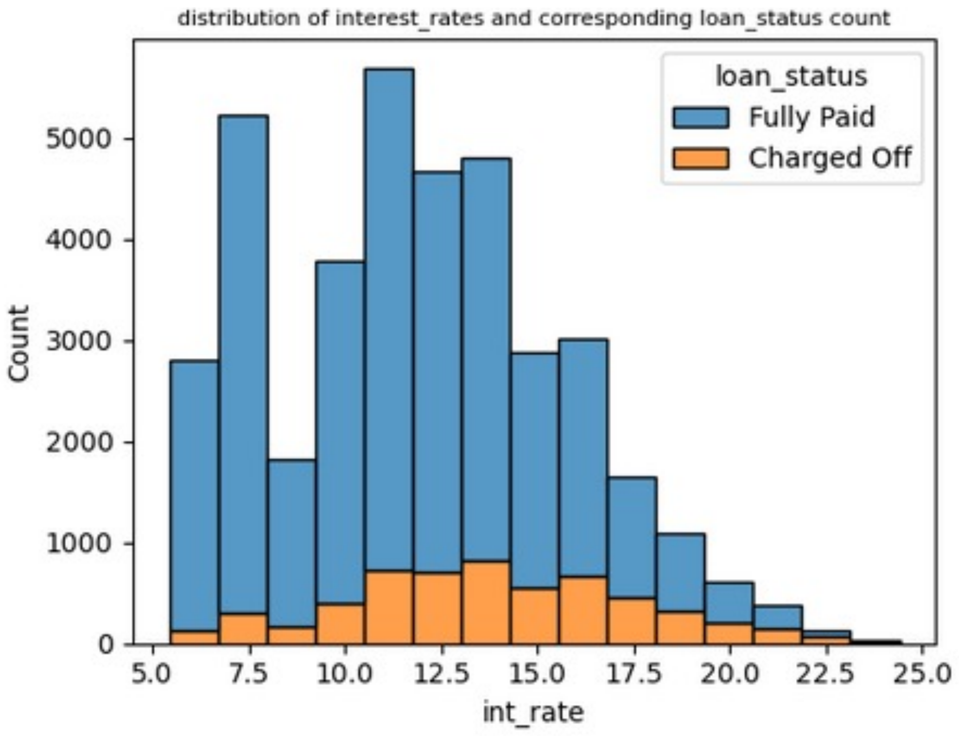


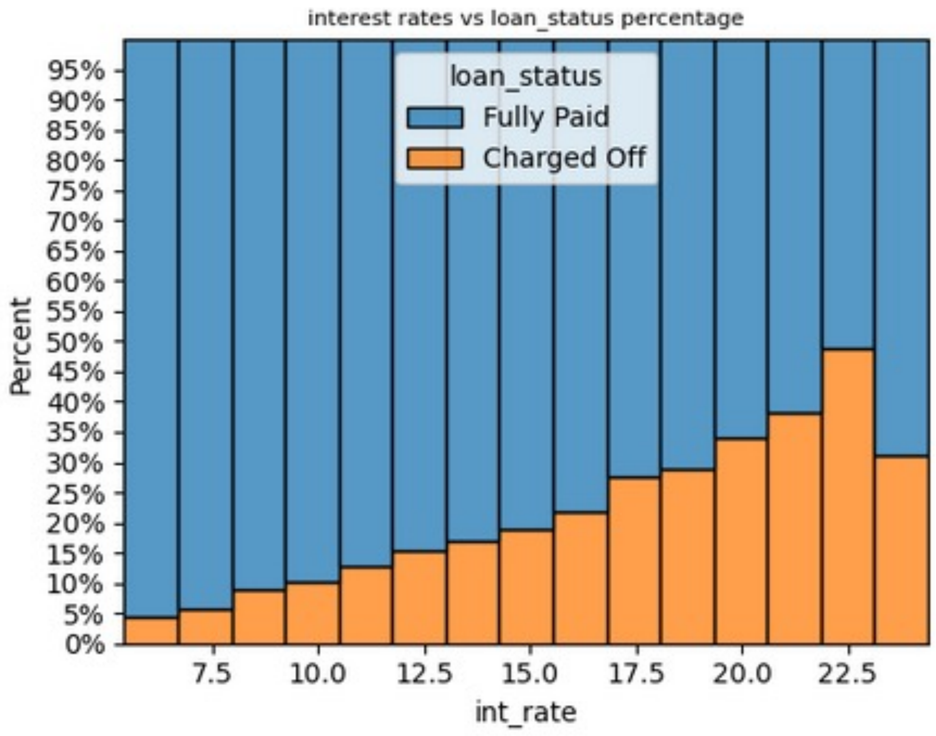


Recommendation

- Looking at above graph, the charged off percentage is from 13%-16% for all emp_length hence emp_length does not make much of a difference. But investors are allowing less amount loan to borrowers with emp_length 10+ years and <1 year which is causing loss in interest rates for investors and company.
- Company can interact with the investors asking the pain points of investors not trusting borrowers with 10+ years and <1 year of experience.

Effect of interest rates on loan status

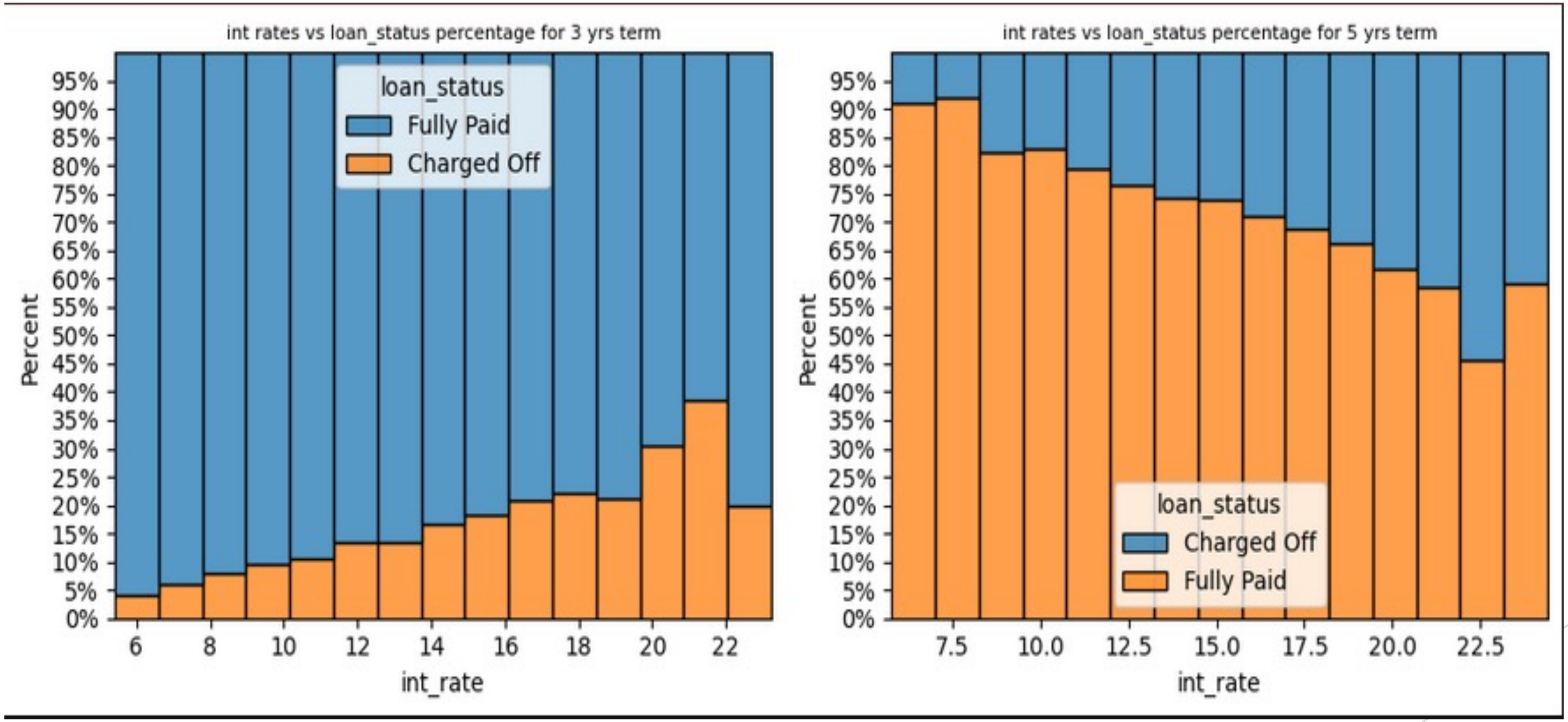




Recommendations

1. Looking above, maximum loans are taken at interest from 10% - 15% and also at rate 7.5%.
2. The charged off percentage keep on increasing consistently as the interest rates increases.
3. Loans given at higher interest rates tend to default more and closes to around 50% at interest rate between 22-25%. In order to avoid defaults, the interest rates at which loan is provided should be less and more focus should be given to loans provided at interest rates above 17.5%

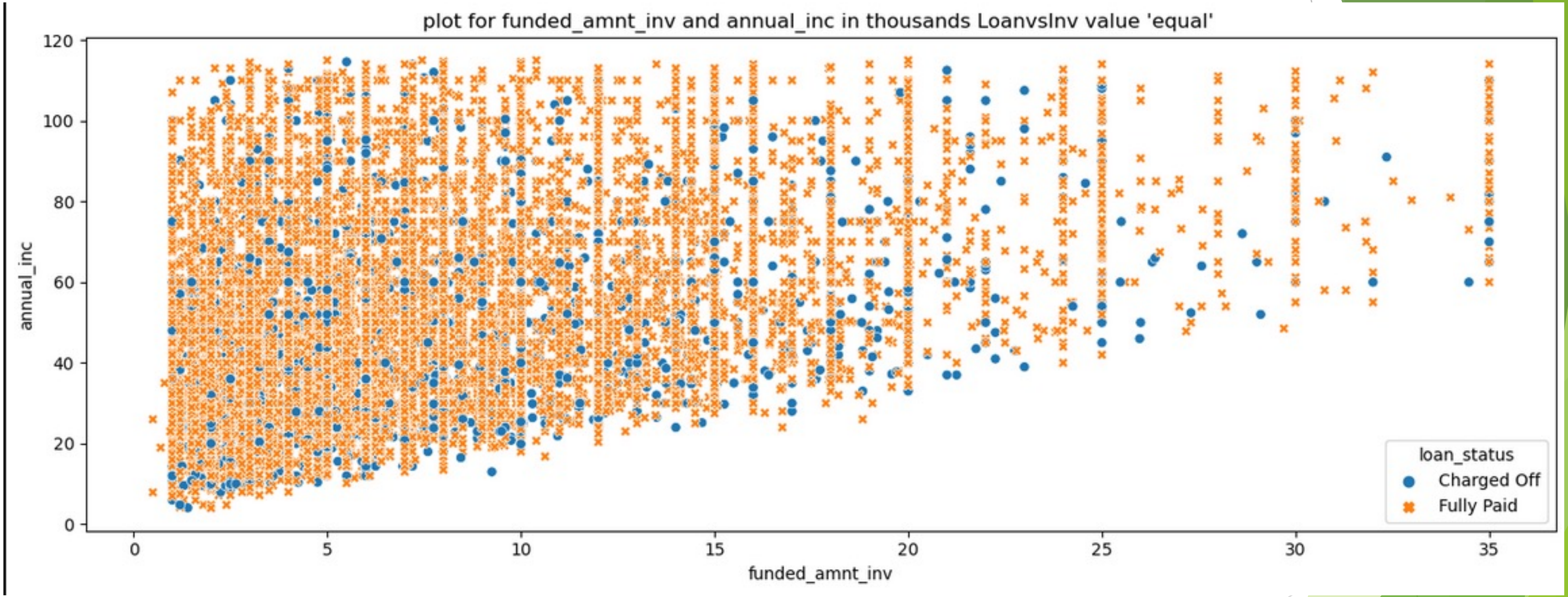
Impact of term feature on interest rate and loan status.



Recommendations

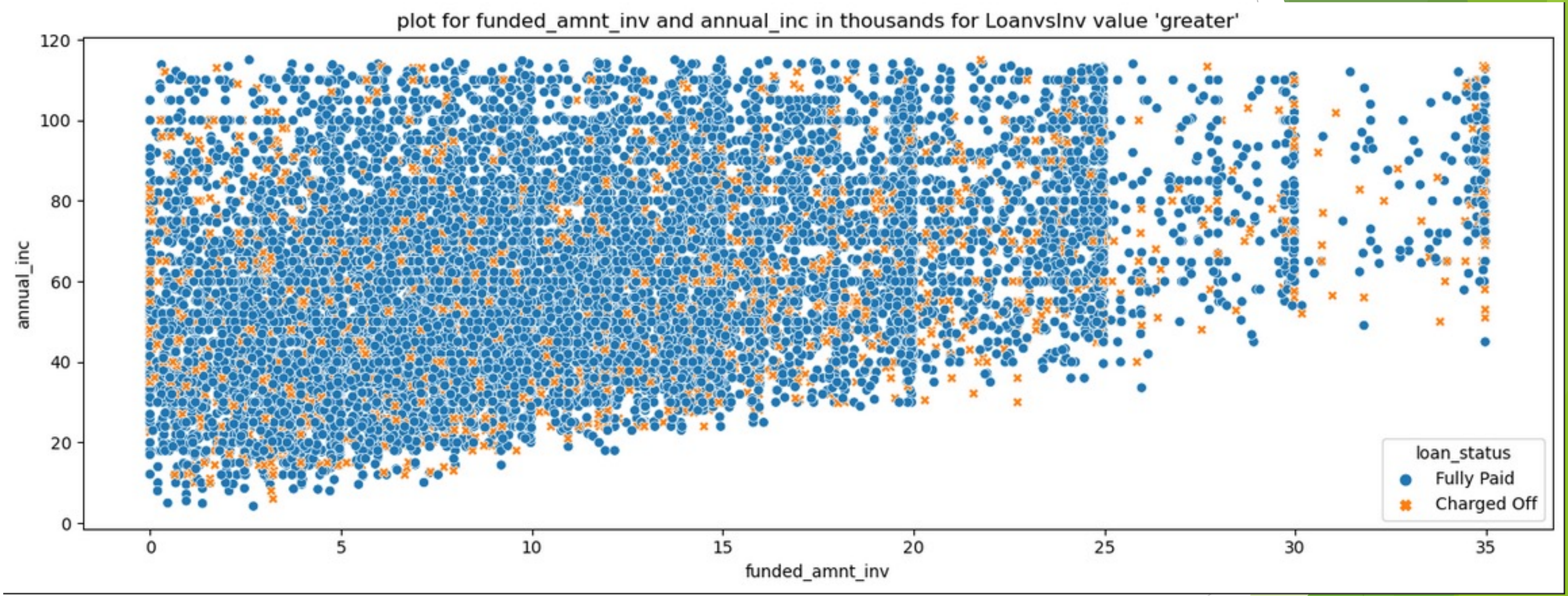
1. From above graphs, we can see that the charged off rate is much higher (around 10% more) for 5 year term. Beyond 12.5% interest rate, the charged off rate is more than 25% which is considerably high. LC company and hence investors should refrain from providing loans at interest rates greater than 12.5% for 5 year term.
2. For 3 year term, LC and hence investors should refrain from providing loans at int rates greater than 20% for 3 year term as charged off rates is has increased drastically to 30%.

Analysing annual income feature



Plot for annual income vs funded amount by investors to see the loan_status when loan amount equals funded amount by investors.
Note: Have normalized the features to nearest thousands.

Analysing annual income feature

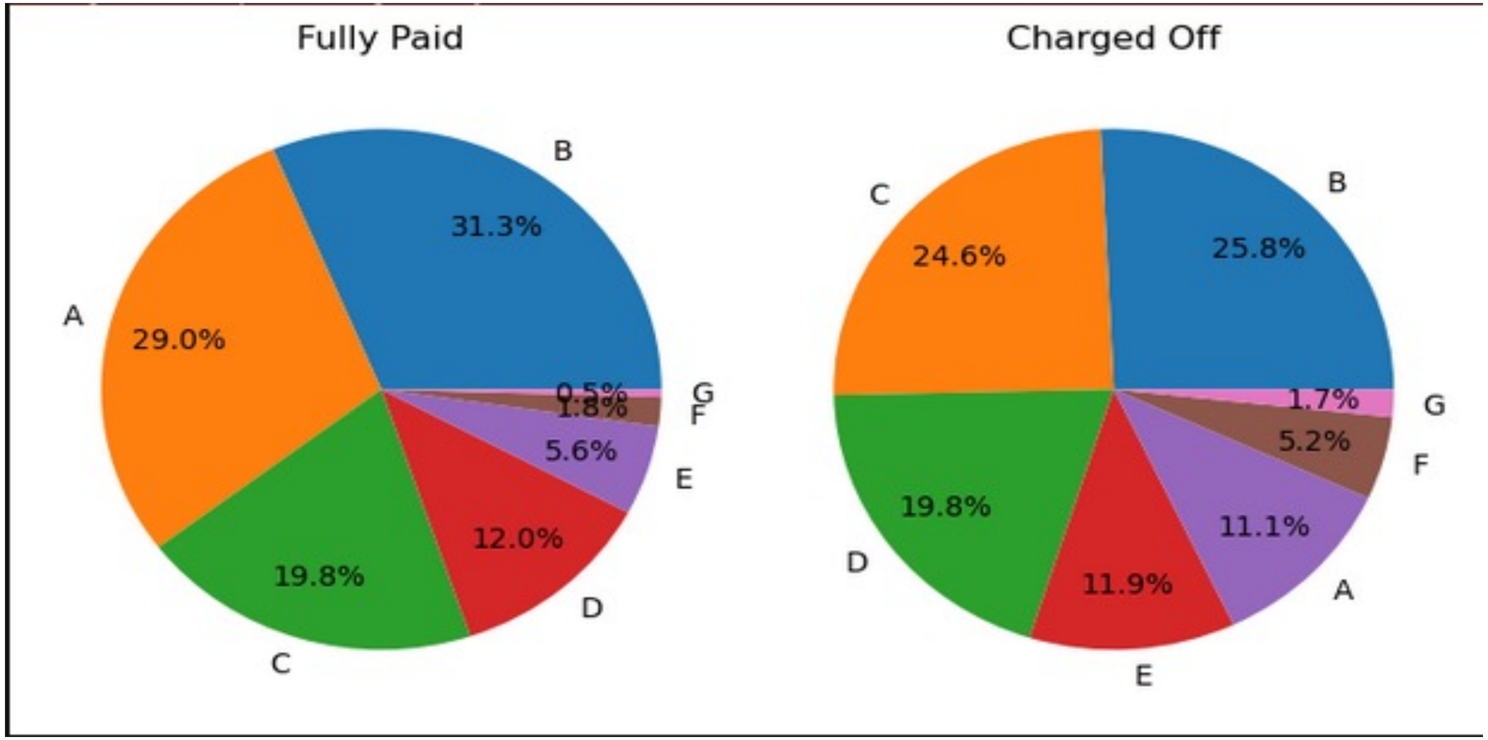


Plot for annual income vs funded amount by investors to see the loan_status when loan amount is greater than funded amount by investors.
Note: Have normalized the features to nearest thousands.

Recommendations

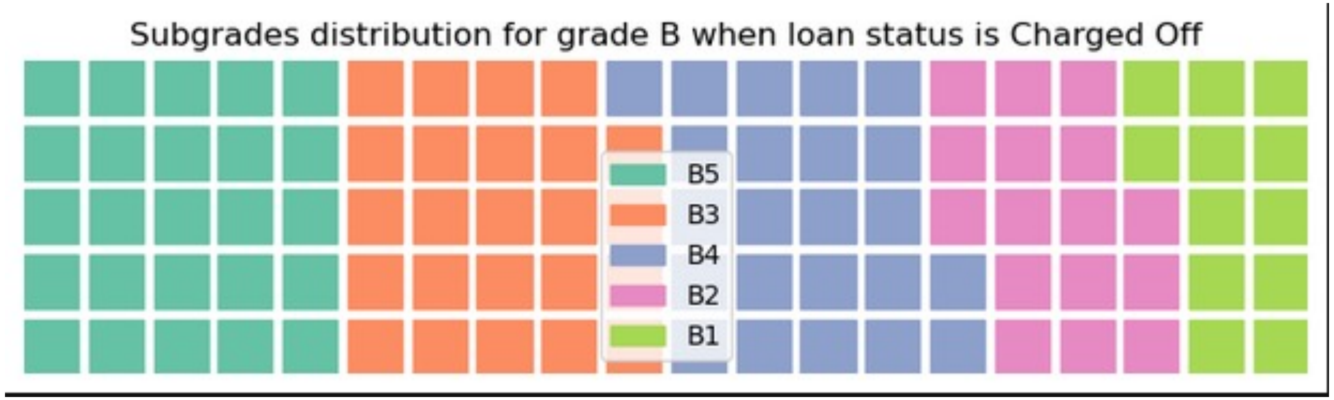
- Looking above, investors tend to allow less investment to borrowers above loan amount of 20k but the amount of loan defaults seems unimpacted.

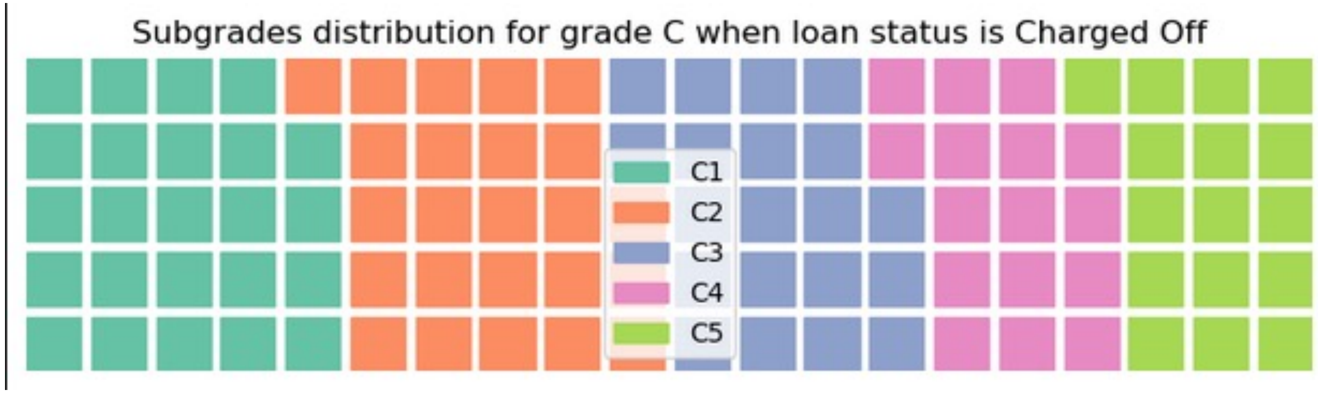
Analysing grade feature.

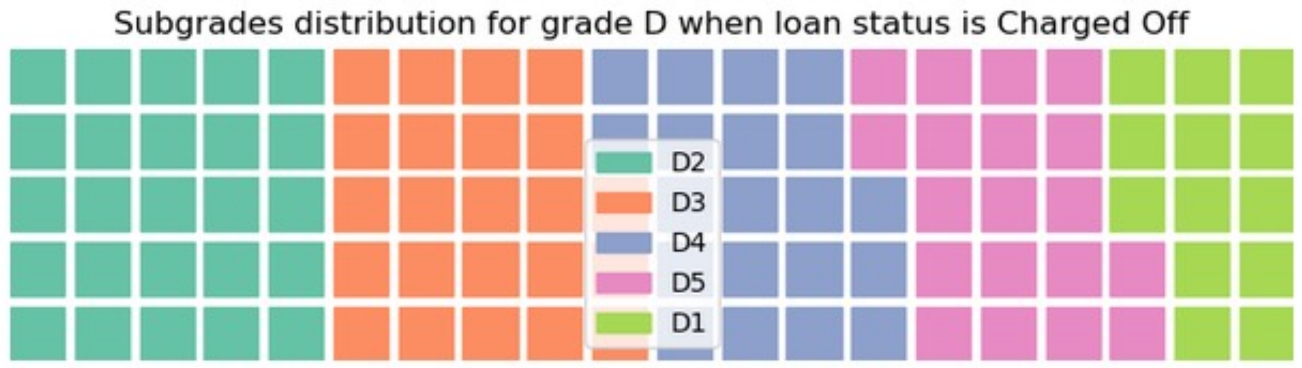


Out of all charged off loans, B,C and D grade loans are getting charged off mostly with 25.8%, 24.6% and 19.8% respectively.
Now will calculate the subgrades of grades B,C and D having most charged off percentage.

Analyzing subgrade feature







Recommendations

- In B grade, B5,B3 and B4 grades are resulting in more charged Off loans.
- In C grade, C1,C2 and C3 are resulting in more charged Off loans.
- In D grade, D2 and D3 are resulting in more charged Off loans.
- LC company can deep dive more on the reasons for defaults for these sub groups.

Q&A

Thankyou