

LOAN ASSIGNMENT SUBMISSION

Name: Dhiraj Mishra, Vibhuti Shah

Description of Assignment

A **consumer finance company** specializes in lending various types of loans to urban customers. When the company receives a loan application, the company has to make a decision for loan approval based on the applicant's profile. Two **types of risks** are associated with the bank's decision:

- If the applicant is **likely to repay the loan**, then not approving the loan results in a **loss of business** to the company
- If the applicant is **not likely to repay the loan**, i.e. he/she is likely to default, then approving the loan may lead to a **financial loss** for the company

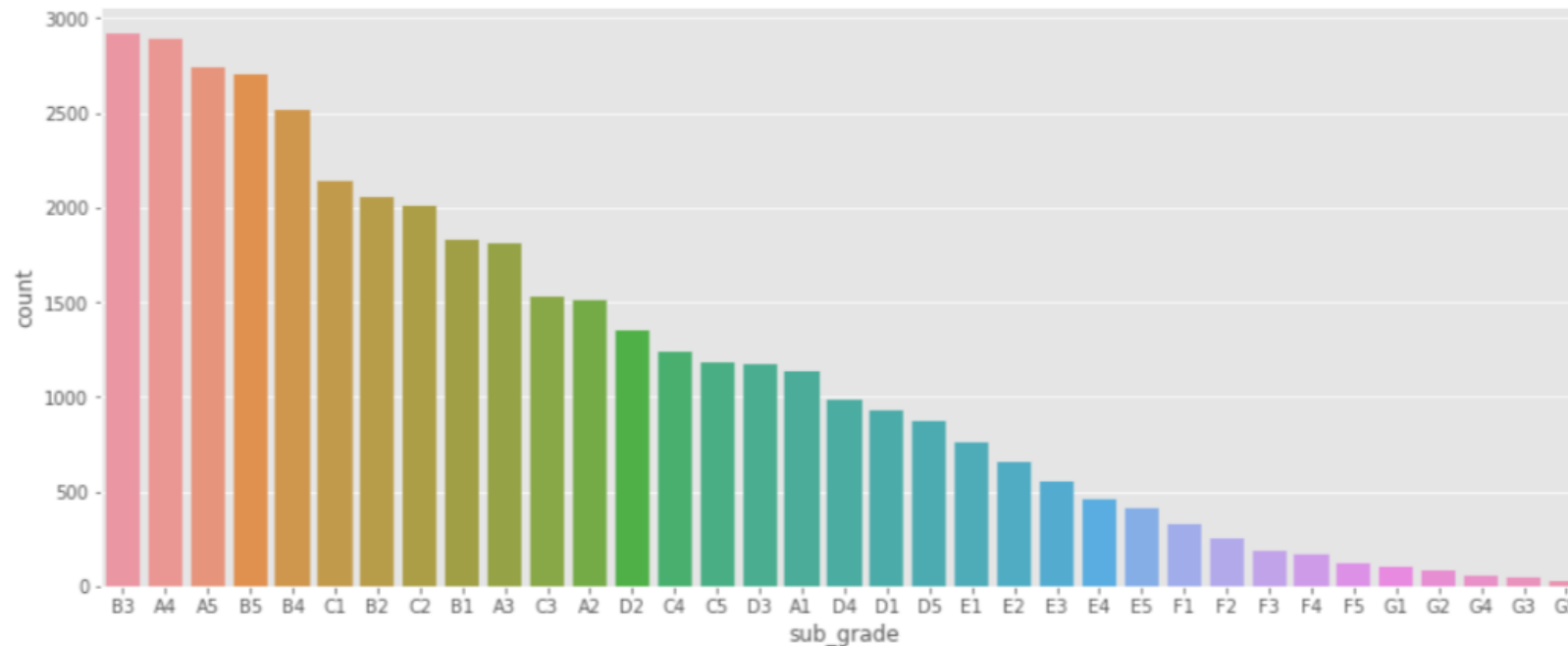
The company wants to understand the **driving factors (or driver variables)** behind loan default, i.e. the variables which are strong indicators of default. The company can utilize this knowledge for its portfolio and risk assessment.

Below graph shows the distribution of loans on the basis of sub-grades which is directly related to interest-rate.

Borrowers with grades B3 is significantly higher than the other available sub-grades. Sub-grades with G1-G5 are less possible because the lending company prefers not to give loans to G grade because of less chances of repaying.

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sns.countplot(x='sub_grade',data=data,order=data['sub_grade'].sort_values(ascending=False).value_counts().index)
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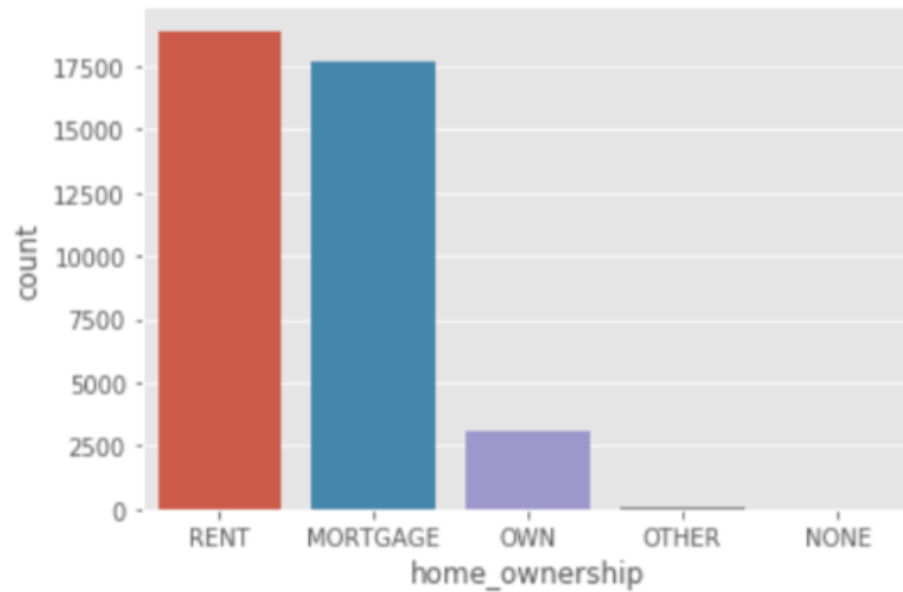
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Below graph depicts the count of home ownership

Those with home ownership as rented and mortgage are the highest borrowers

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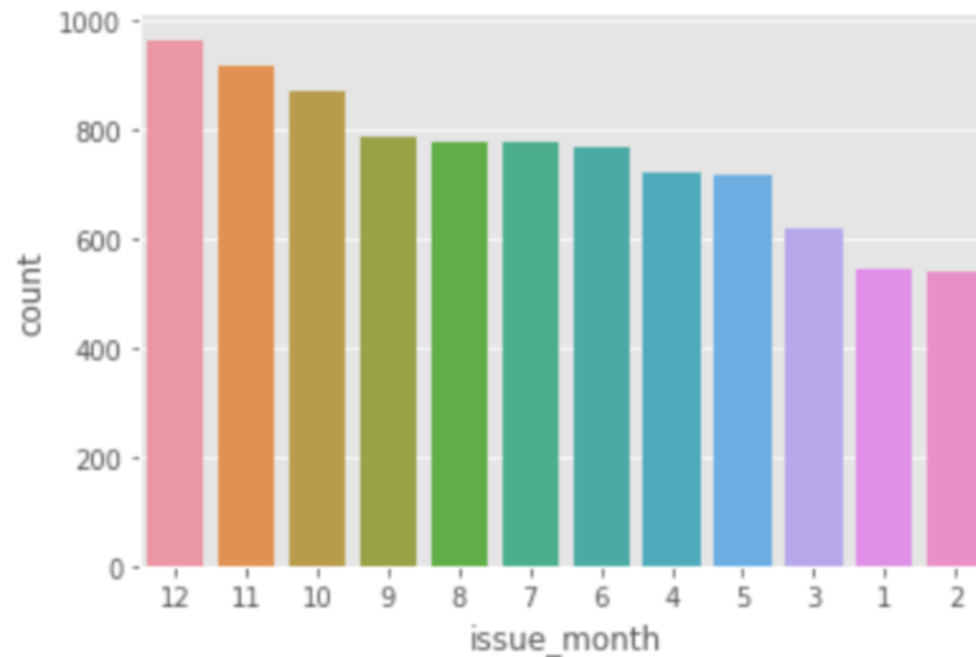


Below graph shows the frequency of loan requestors over the years for a given month.

The lending company can increase the interest rate of loans around December as many people are likely to borrow in the Christmas season.

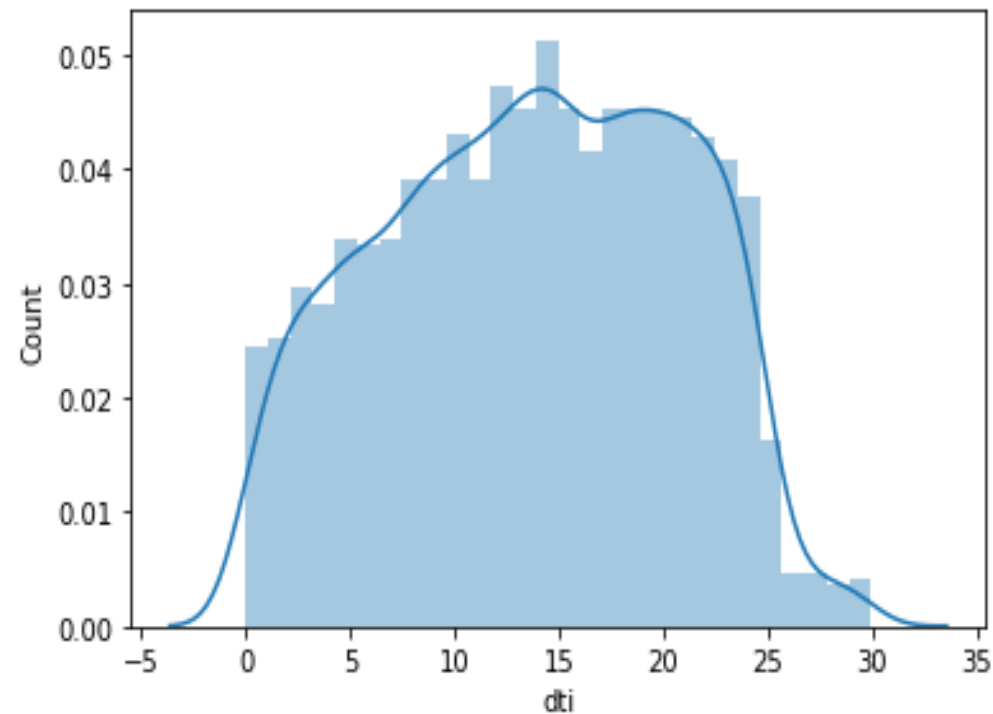
It can choose to give loans on lower interest rates in Spring to increase the number of loan applicants.

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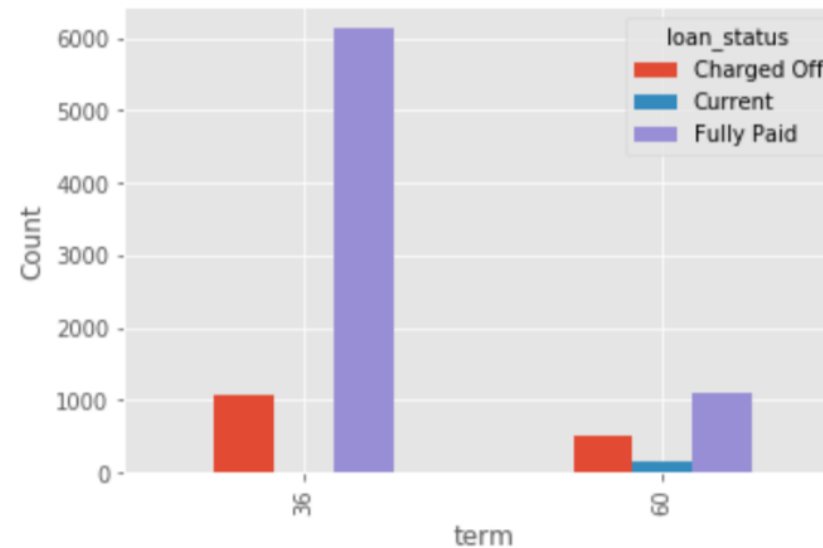
Below graph shows the distribution of dti . Number of people increase for dti 15 and drop after that.

It could be as borrowers whose dti is more tend to apply while the lending club may not lend for very high dti values so there is a decline there



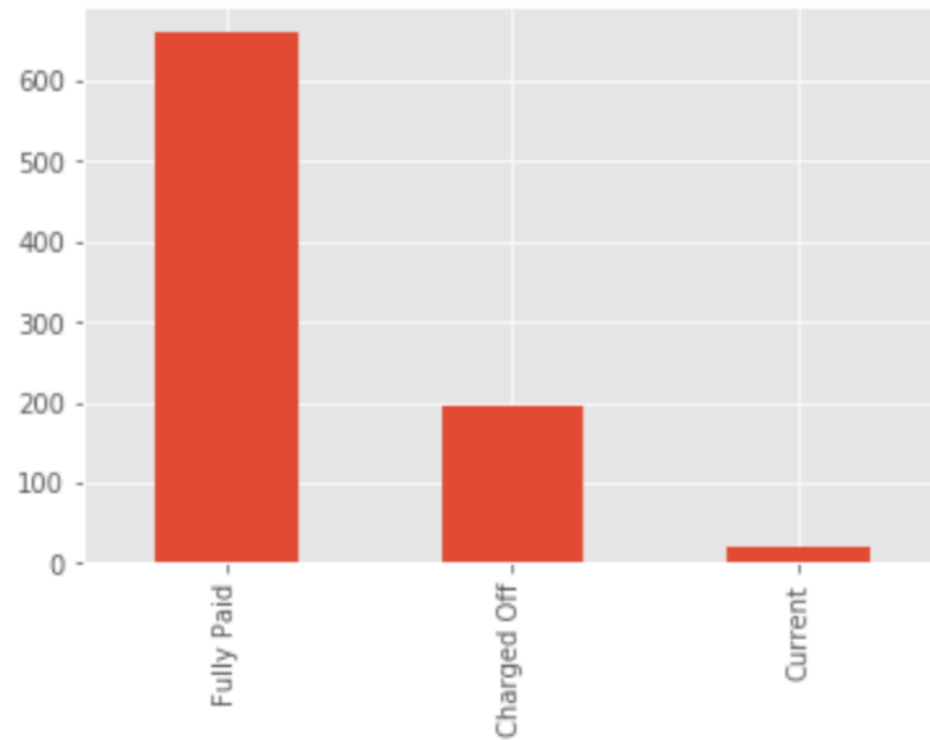
Term vs Status of loan : From the below graph it's Clearly visible that long term loans are much more likely to default

loan_status	Charged Off	Current	Fully Paid
term			
36	1086.0	NaN	6138.0
60	509.0	158.0	1110.0

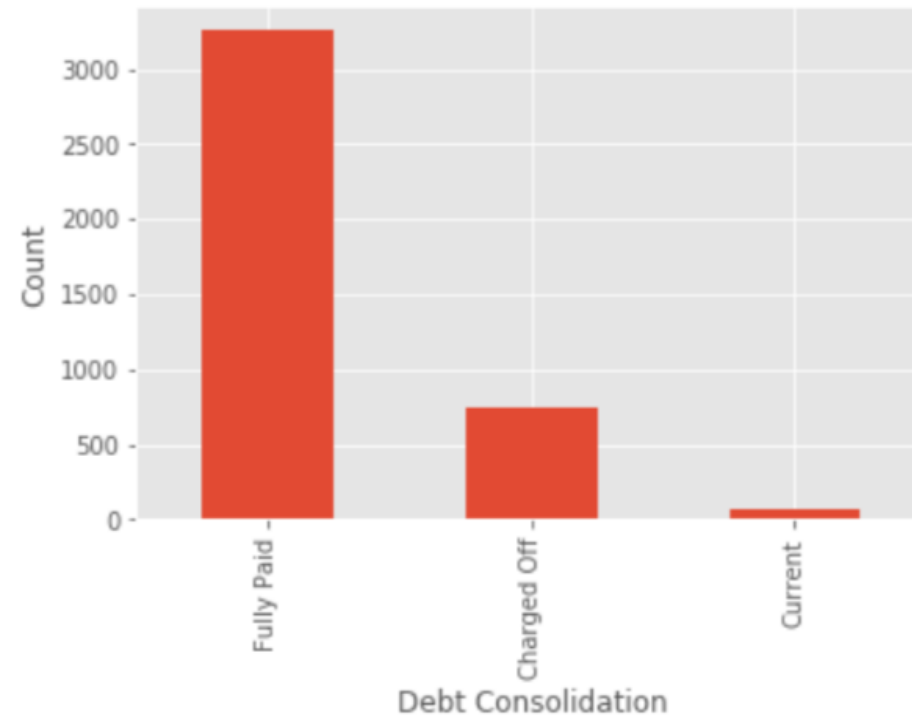
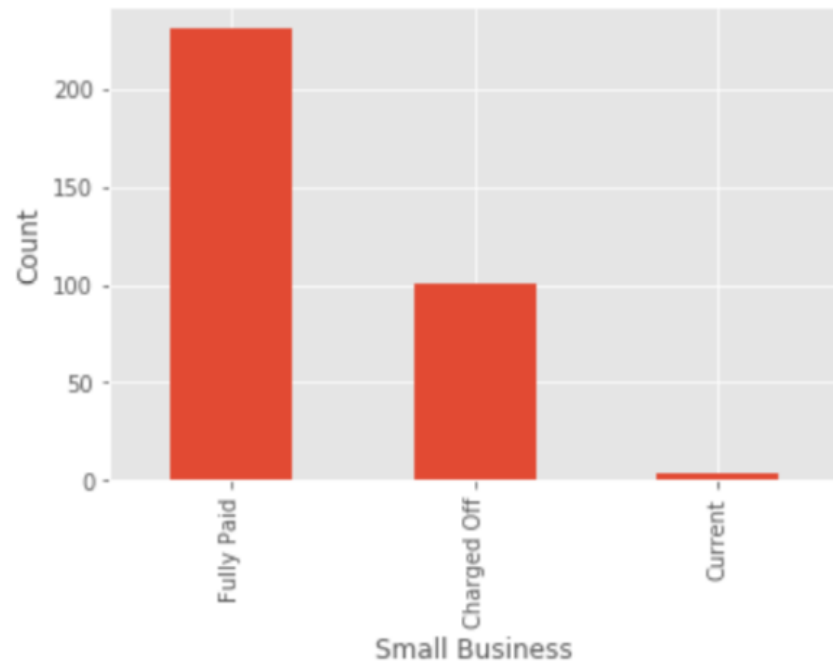


No Employment details vs Status of loan : From the below graph it's Clearly visible that the risk factor here is 20% i.e. 1 out of 5 are prone to becoming charged off.

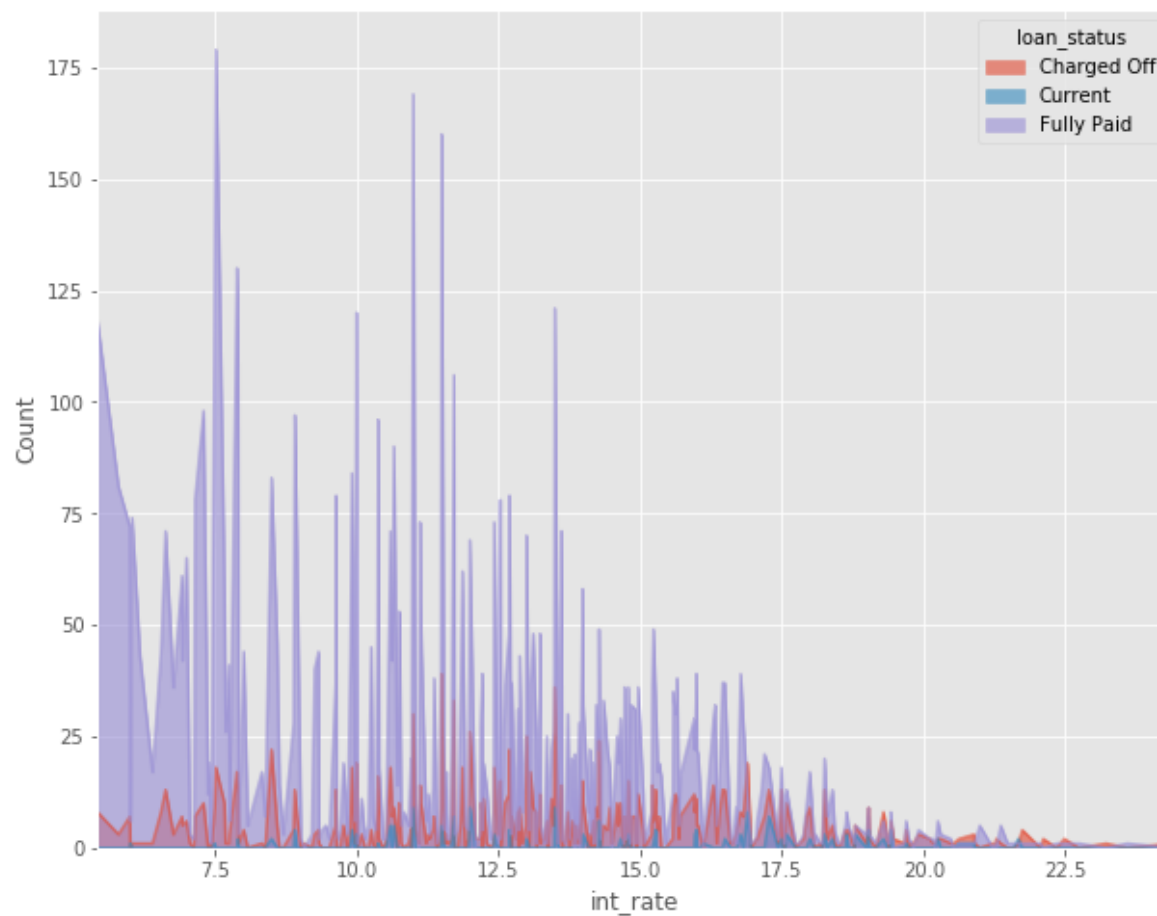
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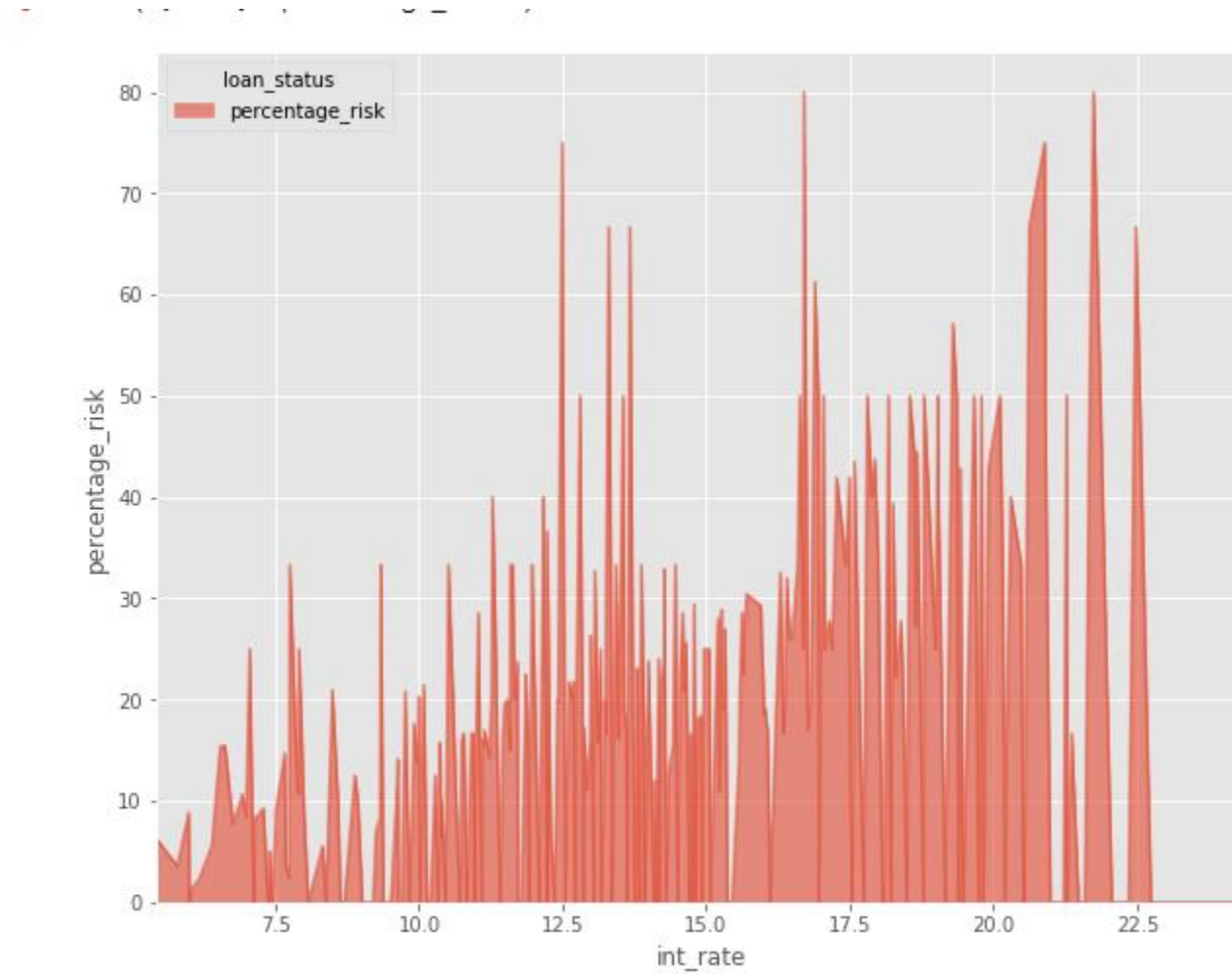
Purpose (“Small Business”) vs Status of loan : People with Small business are likely to get charged off as compared to debt consolidation.



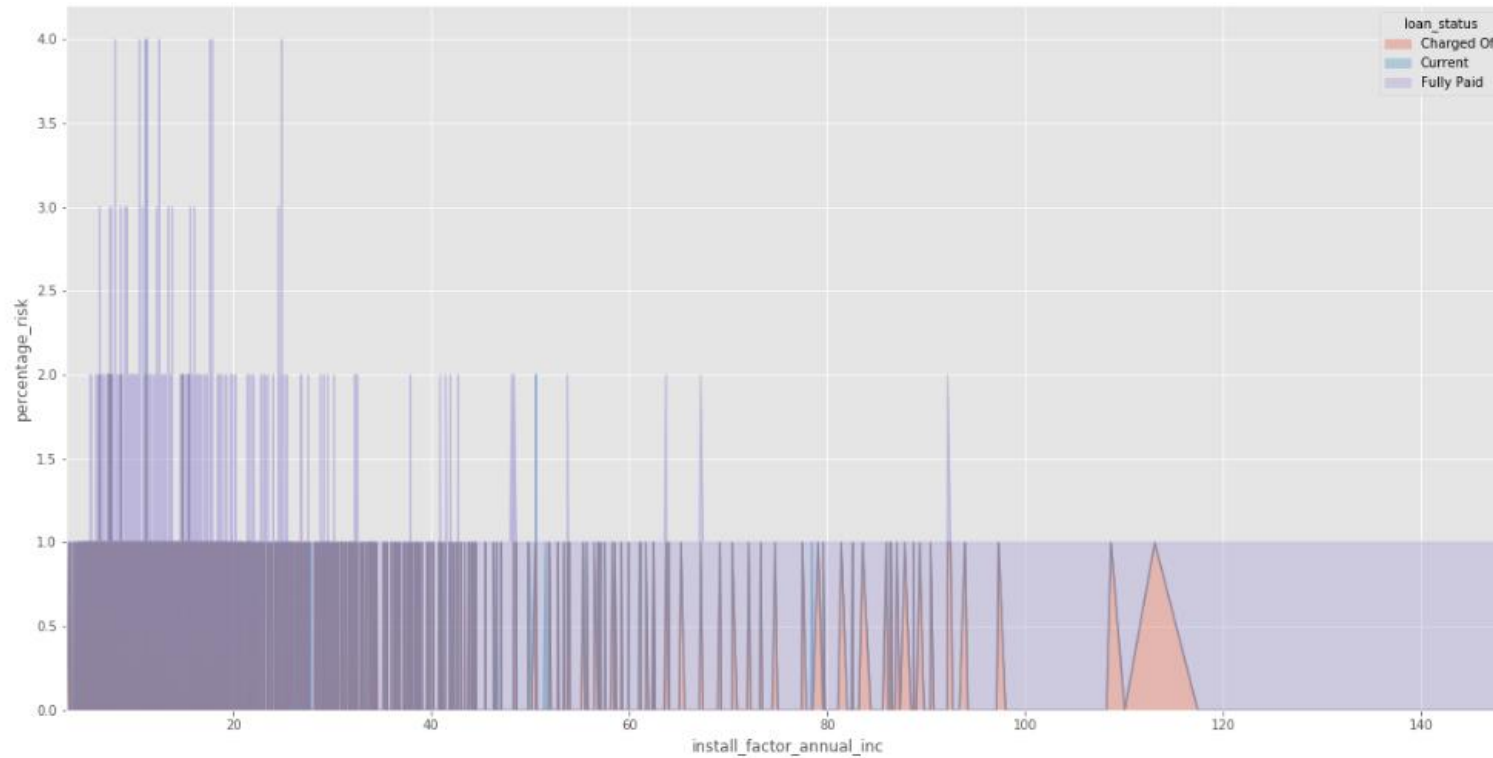
Interest rate vs Status of loan : Count of charged off increases as interest rate increases



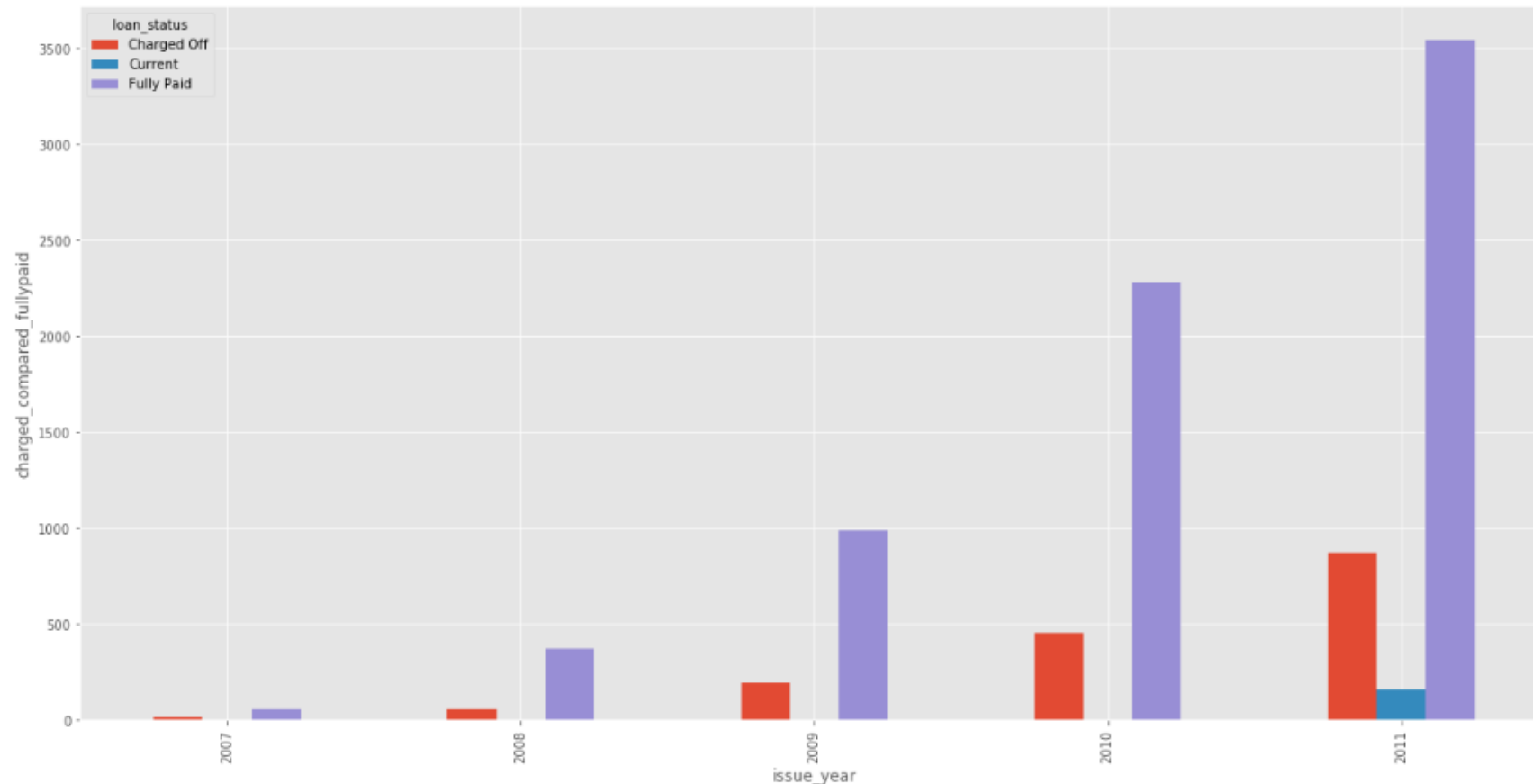
Interest rate vs Status of loan : Percentage of charged off increases as interest rate increases



Annual income as a factor of installation factor vs Status of loan : Annual income as a factor of installation factor is higher for borrowers who have fully paid as compared to those who are charged off



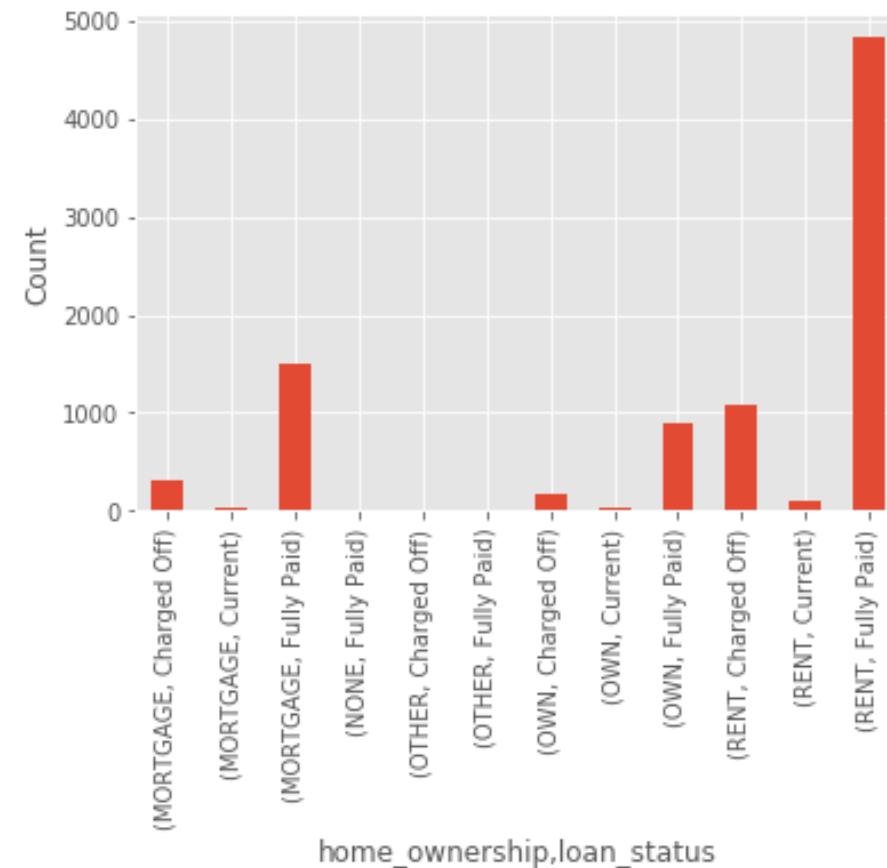
Issue year vs Status of loan :People who borrowed before 2008 show very few charged off compared to fully paid. People who borrowed in 2008 show a spurge in charged off compared to fully paid. People who borrowed after 2008, tend to show a declining rate of charged off compared to fully paid. This could be owing to the recession in 2008.



The below graph shows the distribution of home ownership over the loan status i.e. how many of Rented loan applicant are charged-off, full paid or current and same for other home ownerships.

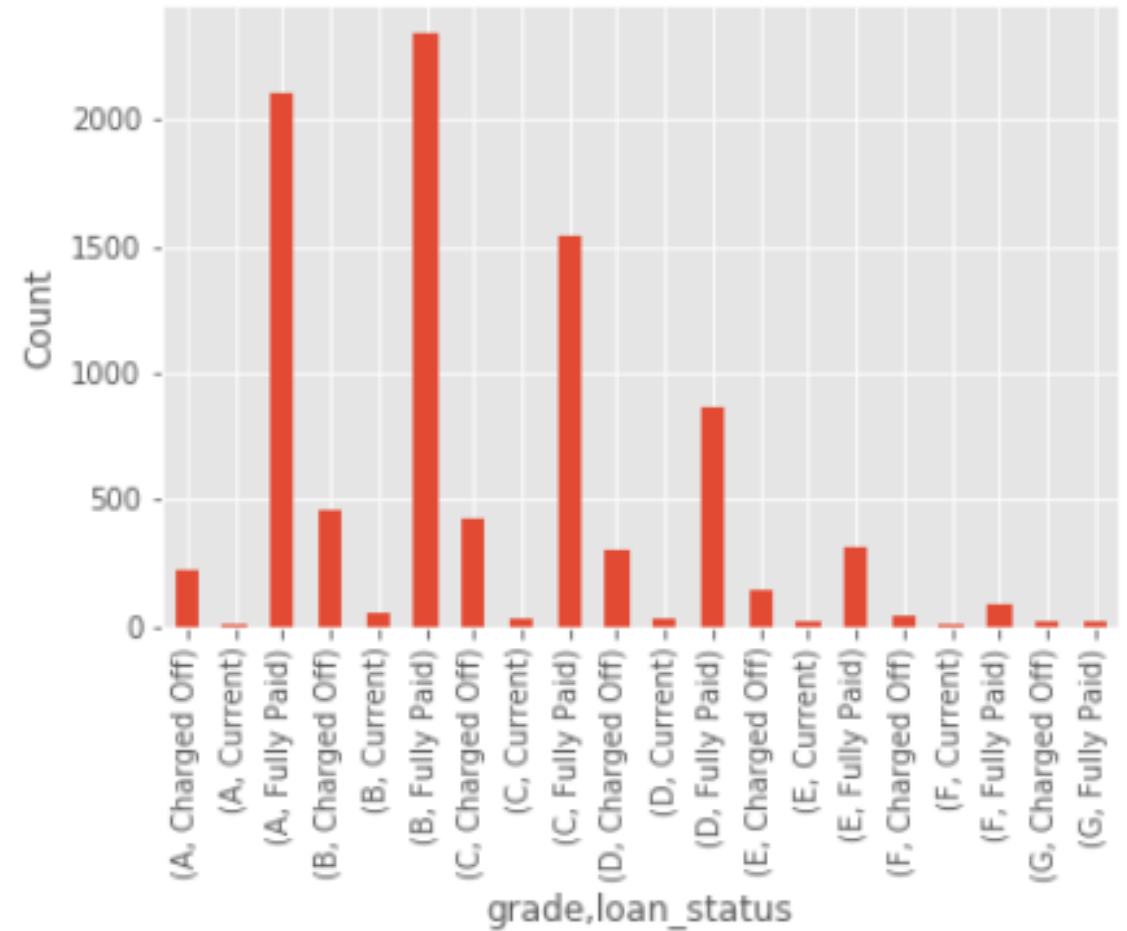
Mortgage and rent home ownership applicants show higher percentage of defaults

loan_status	Charged Off	Current	Fully Paid	charged_compared_fullypaid
home_ownership				
MORTGAGE	322.0	33.0	1502.0	4.664596
NONE	NaN	NaN	1.0	NaN
OTHER	5.0	NaN	19.0	3.800000
OWN	180.0	30.0	902.0	5.011111
RENT	1088.0	95.0	4824.0	4.433824



The below graph show the status of loan over the grades which is given by the lending club.

loan_status	Charged Off	Current	Fully Paid	charged_compared_fullypaid
grade				
A	221.0	9.0	2100.0	9.502262
B	457.0	55.0	2335.0	5.109409
C	421.0	34.0	1536.0	3.648456
D	302.0	32.0	866.0	2.867550
E	136.0	22.0	316.0	2.323529
F	41.0	6.0	81.0	1.975610
G	17.0	NaN	14.0	0.823529



Following are some of the recommendation for the consumer finance company :

With an increase in interest rate, percentage of defaulters increase. Above an interest rate of 17%, the lending club should be extremely cautious while lending.

People with a 36 months term are more likely to pay. People who are 36 months term could be considered over 60 months.

People with own house ownership should be considered over those with mortgage and rent home ownership.

The purpose is also a deciding factor as small business are more likely to be default followed by renewal energy, education.

December is the best month to increase interest rate as there are more borrowers .During spring it's good to give more loans with less interest rate for more profits to investors.

People with annual income greater than yearly installment should be considered. Those whose yearly installment comes out be double and above than annual income have extremely meagre chances of paying.

People with A grades show high chance to pay. People should be considered in descending order of their grades i.e. those with A should be considered over b, B over C etc.

Additional Key takeaways :

Very few people are verified. The company needs to work on it's verification system to make it best suited so that more and more loan applicant verify there details before loan get's approved.