Lending Club Case Study

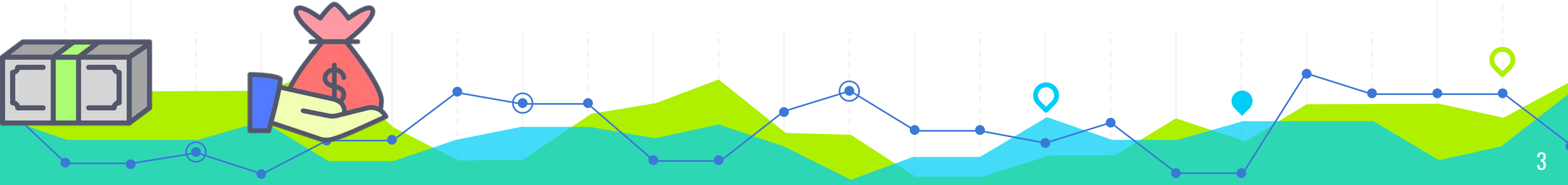
Problem Statement

- Lending Club Case Study, is the largest online loan marketplace, facilitating personal loans, business loans, and financing of medical procedures.
- The Aim of this case study is to analyze the data and point out driving factors behind loan default.

Analysis Begins!

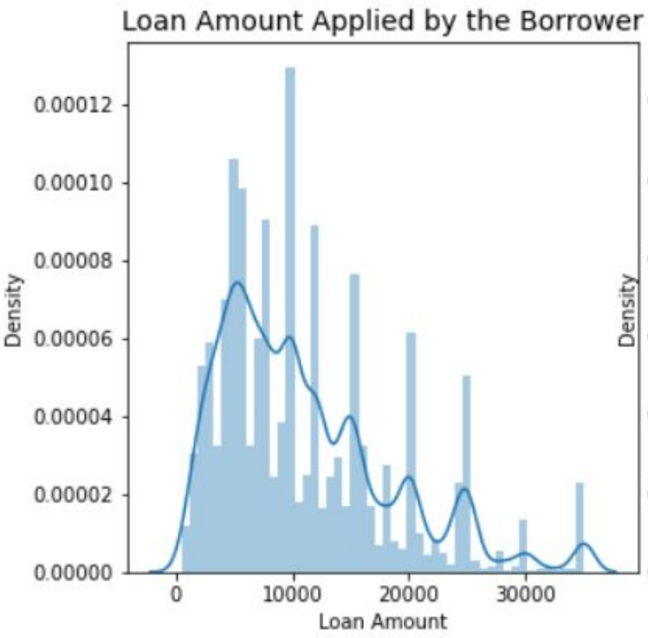
Before we Jump on to the Charts and Numbers here's what we would like you to know first.

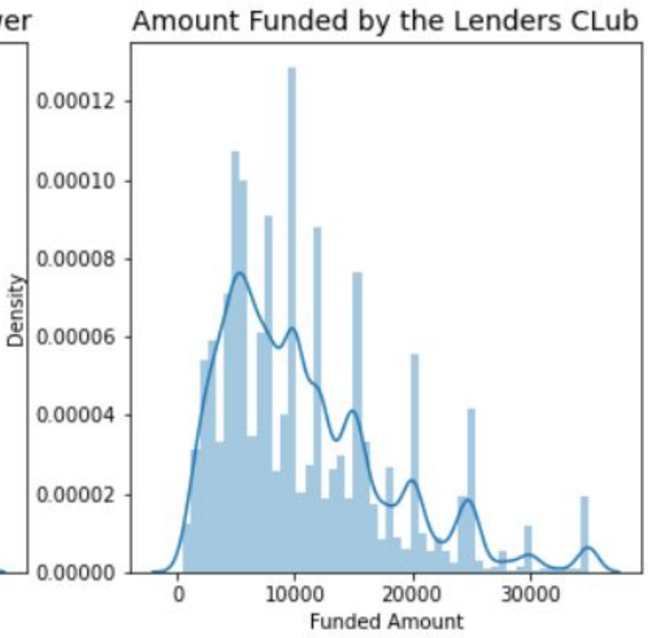
1. Variables which were irrelevant for the analysis has been dropped.
2. Outliers and Missing values has been handled using suitable statistical methods.
3. Customer Information which is available at the time he/she applies for the loan are considered as Important Features for Analysis.

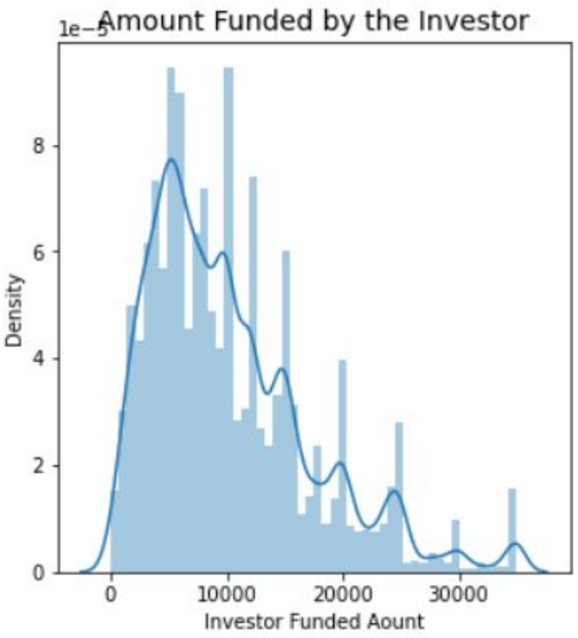


Loan amount Funded and Distributions

The Below Charts depicts the loan amount, funded amount by lenders club and amount funded by the investor follows the same pattern, which makes these columns almost similar as their correlation is positively high.







Time Period Analysis

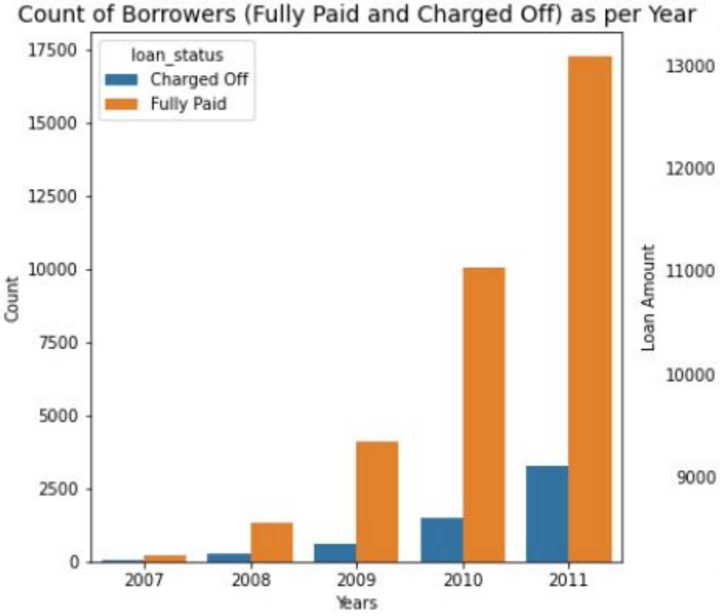


Chart 1

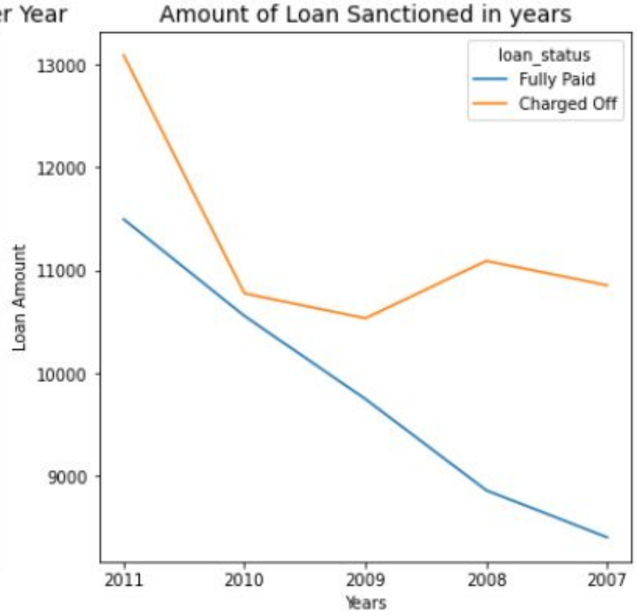


Chart 2

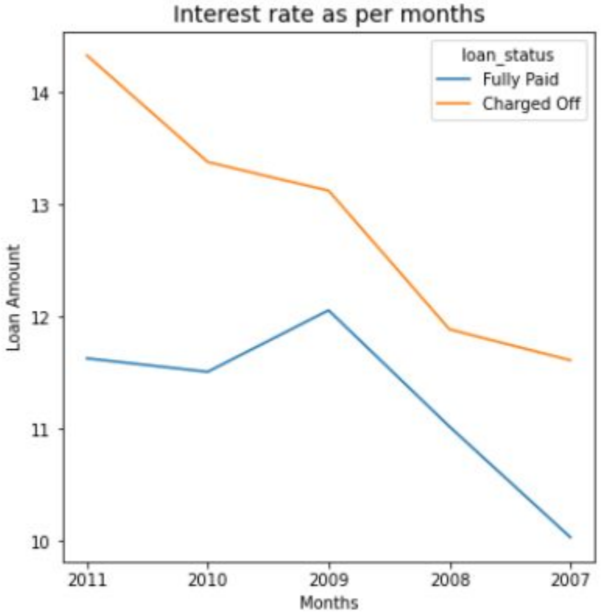


Chart 3

Time Period Analysis

Let us summarise what we saw on the previous slide:

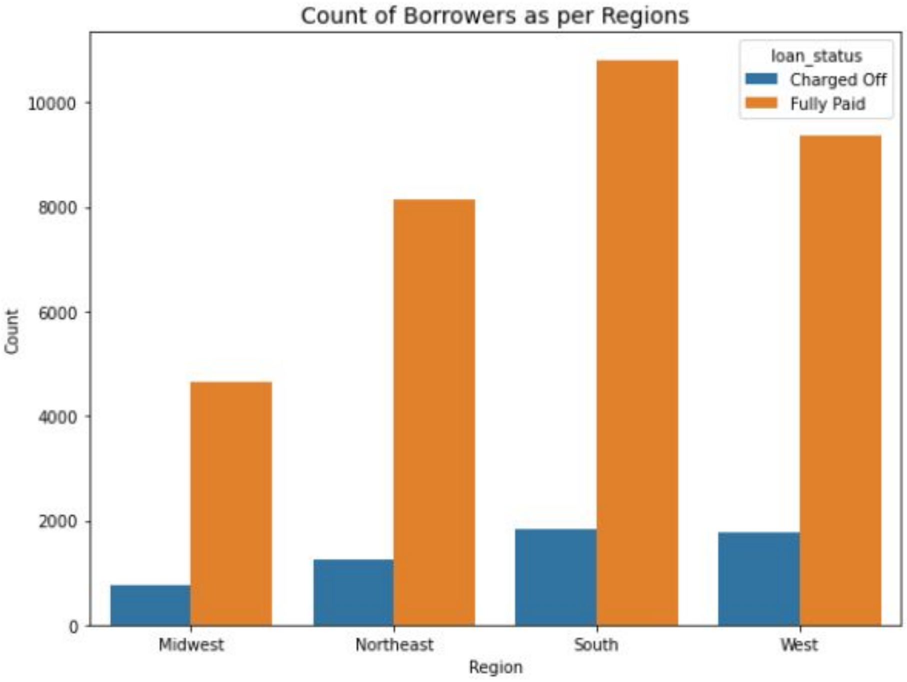
Chart 1:

- Number of loans approved in 2011 were the highest.
- There is a growing trend from 2007 to 2011, we can see around 30-40% increase in number of loans approved.
- We can Expect an Increase in the coming years as well.

Chart 2: we observe that the amount of loan that was charged off was quite a lot when summed up compared to the loan that was paid. this also indicates that the company might have faced some big losses

Chart 3: we notice that there is a huge huge difference between the interest rates of fully paid and charged off customers.

Region Analysis



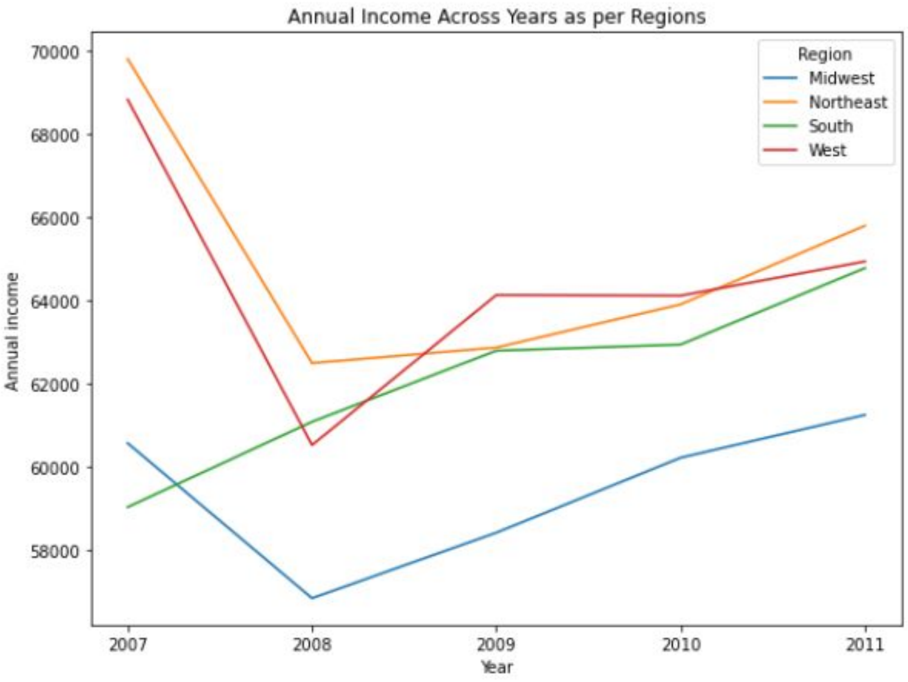


Chart 1

Chart 2

Region Analysis

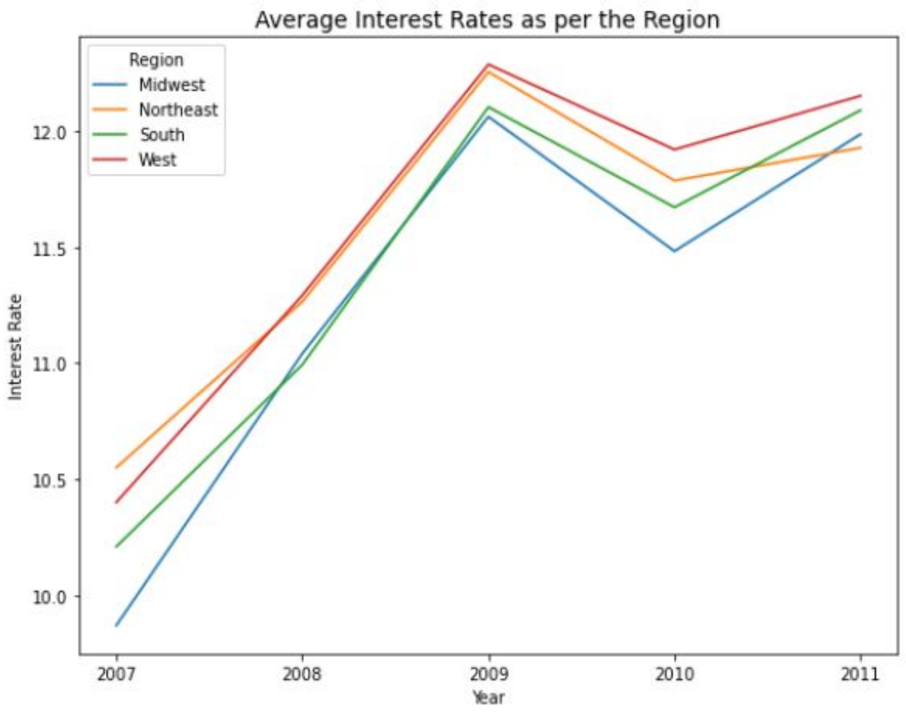
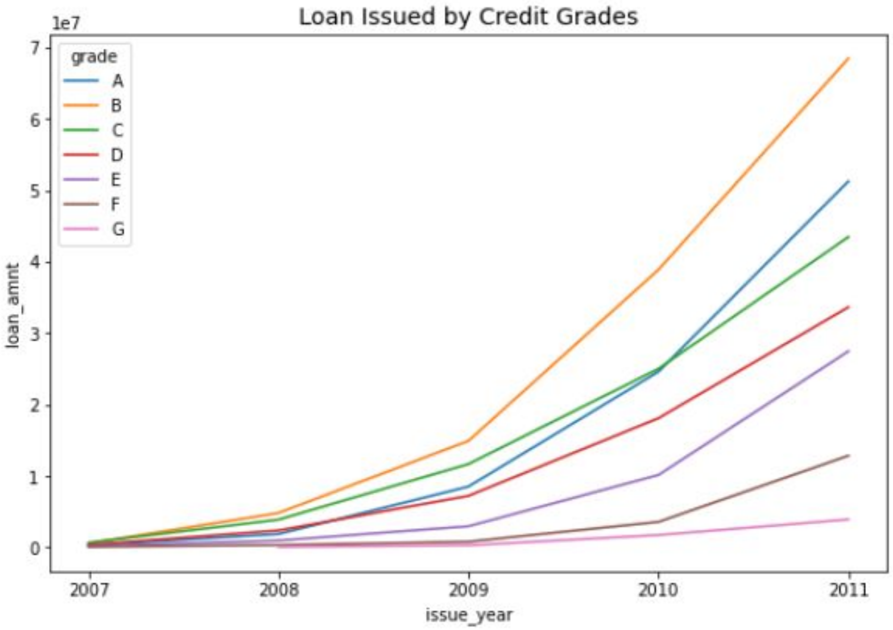


Chart 3

- In the first chart we see that the average annual income of west and south-east regions are the highest, so naturally defaulters should be less from these 2 regions right? but the percentage of defaulters remain almost the same for all regions.
- We can find the reason for this in chart 3, we see that in regions where average income is high the interest rate is also high, which might cause the defaulter rate to be the same across all regions.

Grade Analysis (Risk Assessment)



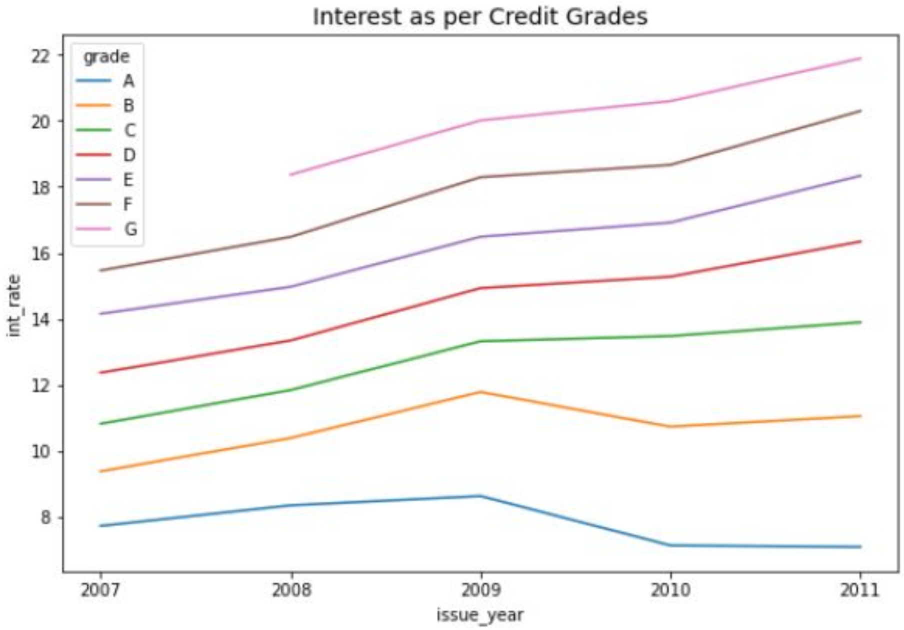
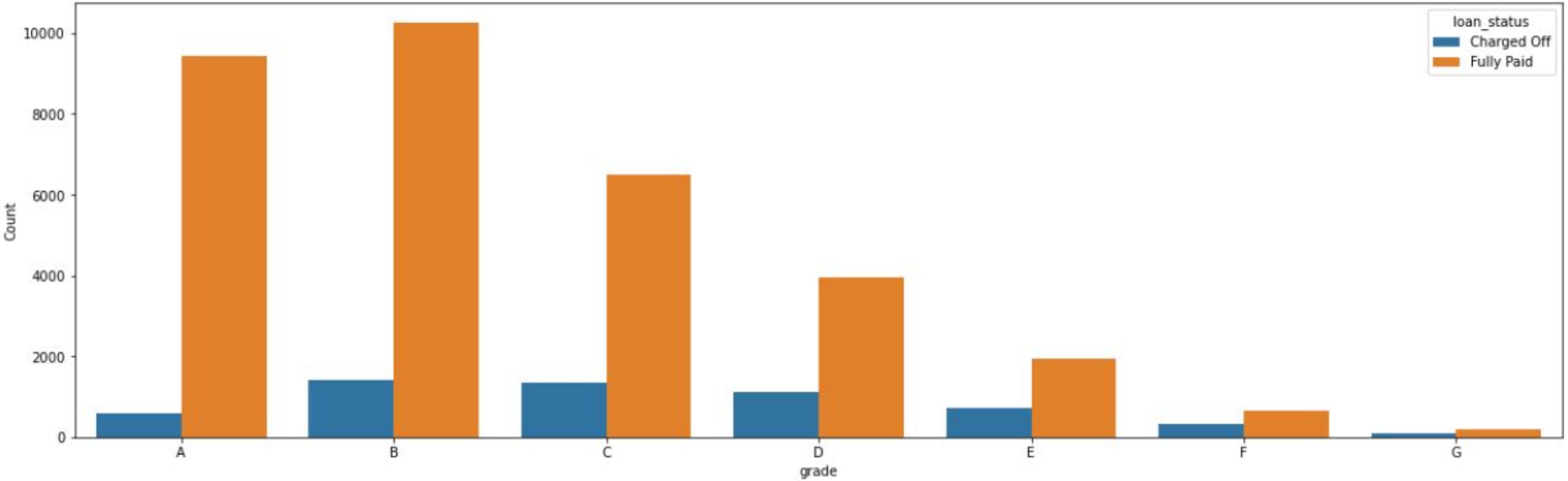


Chart 1

Chart 2

Grade Analysis (Risk Assessment)

1. we see that the most number of loans were approved for grades A, B and C.
2. as we go towards grades D, E, F and G we see that the default rate is increasing (chart 1)
3. over the years the loan amount approved for grade B has been the highest and we see that grades A and B enjoy low interest rates due to their grades.
4. low interest rates is one reason why the rate of defaulters is less in grades A, B and C
5. if you look at grade G, almost 50% of the population falls under defaulters list and high interest rates is one reason for that.



Borrower Income & Employment Length (Risk Assessment)

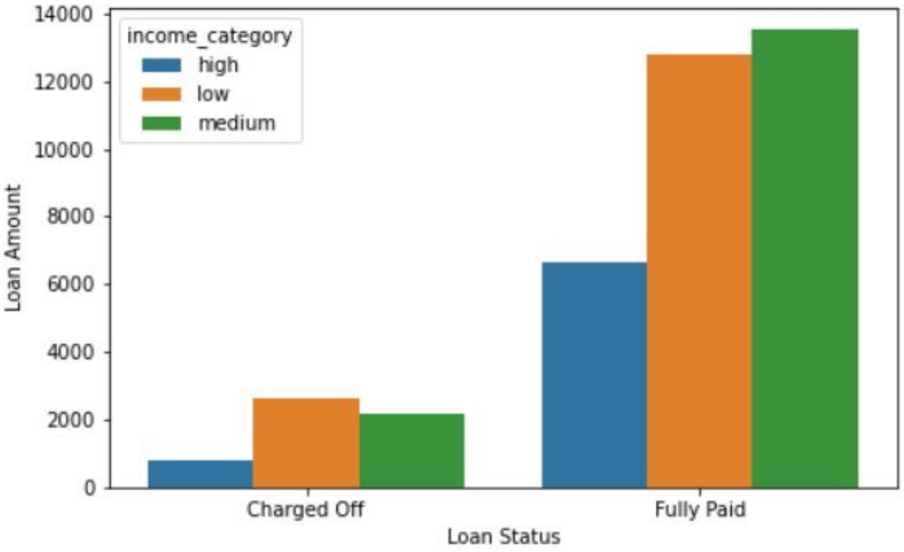


Chart 1

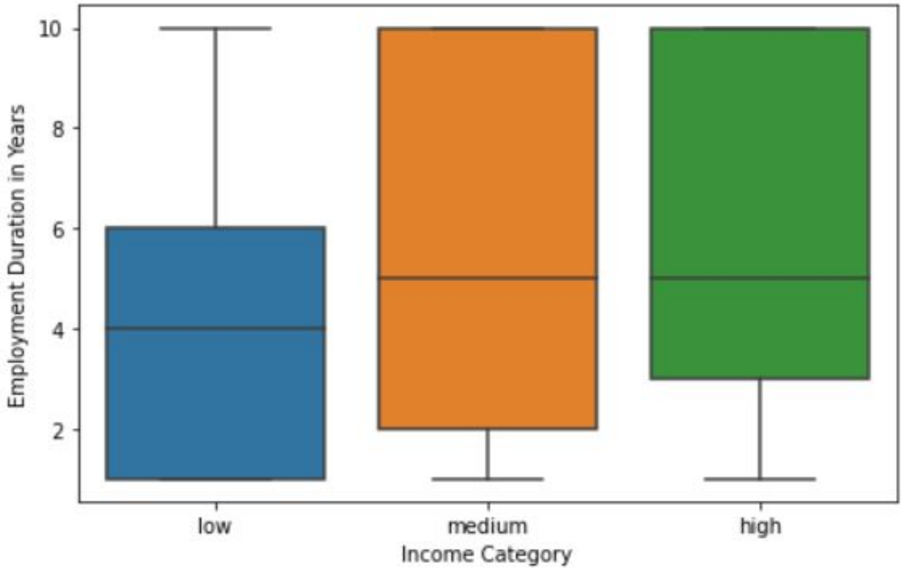


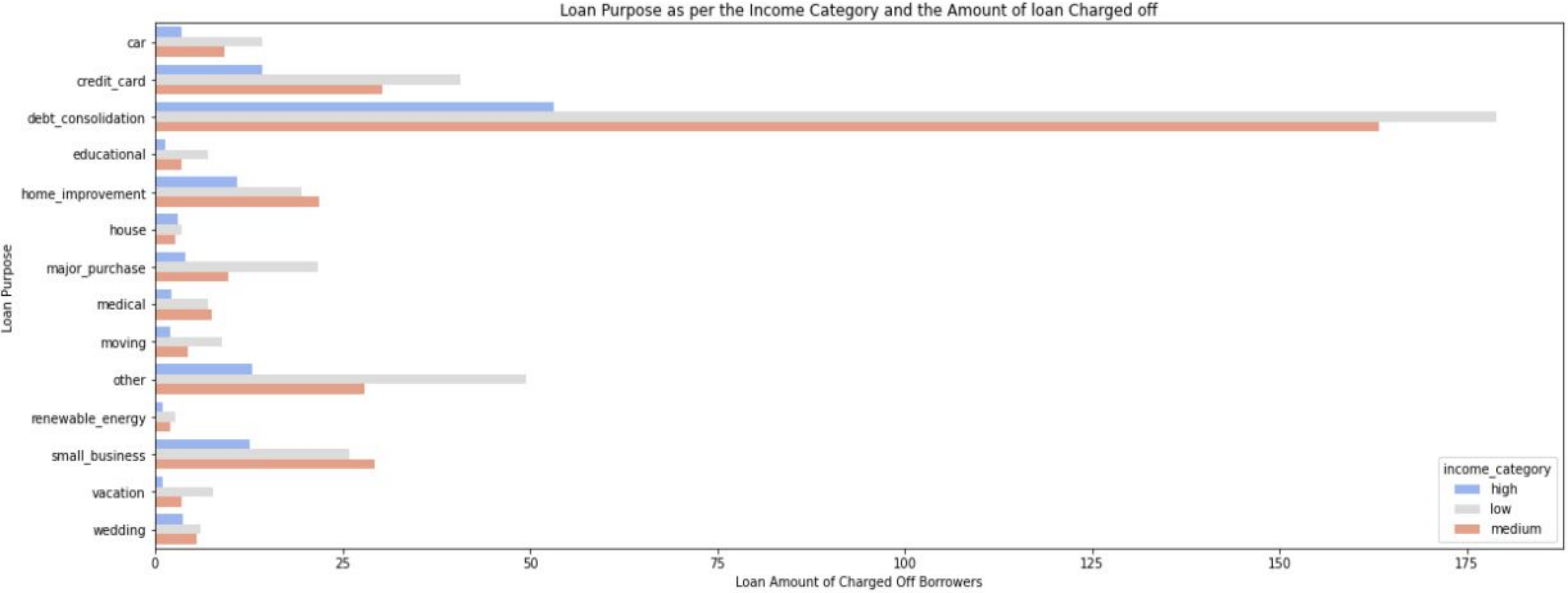
Chart 2

Borrower Income & Employment Length (Risk Assessment)

grade	loan_status	high	low	medium
A	Charged Off	53	348	201
	Fully Paid	1759	3718	3966
B	Charged Off	173	719	533
	Fully Paid	1965	4068	4217
C	Charged Off	168	679	500
	Fully Paid	1255	2690	2542
D	Charged Off	169	498	451
	Fully Paid	814	1538	1615
E	Charged Off	146	260	309
	Fully Paid	547	579	822
F	Charged Off	81	79	159
	Fully Paid	230	152	275
G	Charged Off	28	30	43
	Fully Paid	97	31	70

1. Chart 1: We see that the most number of defaulters are in the low income category (given their income is less and they do not enjoy lower interest rates).
2. Chart 2: People with low income has around 2-6 years of work experience whereas people with medium and high income has around 3-10 years of work experience.
3. **in the cross table we can see that among all the grades people with low incomes have defaulted the most!**

Purpose of Loan (Risk Assessment)



Purpose of Loan (Risk Assessment)

1. The First thing we observe that among all the loan purposes, highest loan application has been received and approved for debt consolidation. the interest rate of of debt consolidation loan is also higher compared to others.
2. In the second chart we Observe that the highest number of defaulters also belong to the debt consolidation group. the particular loan is oftenly asked by the borrowers who fall under low or medium income bracket.
3. We also see that loans for vacation, wedding, medical, house and education has less defaulters.
4. **When offering loan for debt_consolidation the lenders should check if the user belong from high income bracket and also should make sure the borrower's credit score grade is at least C.**

DTI Rate (Risk Assessment)

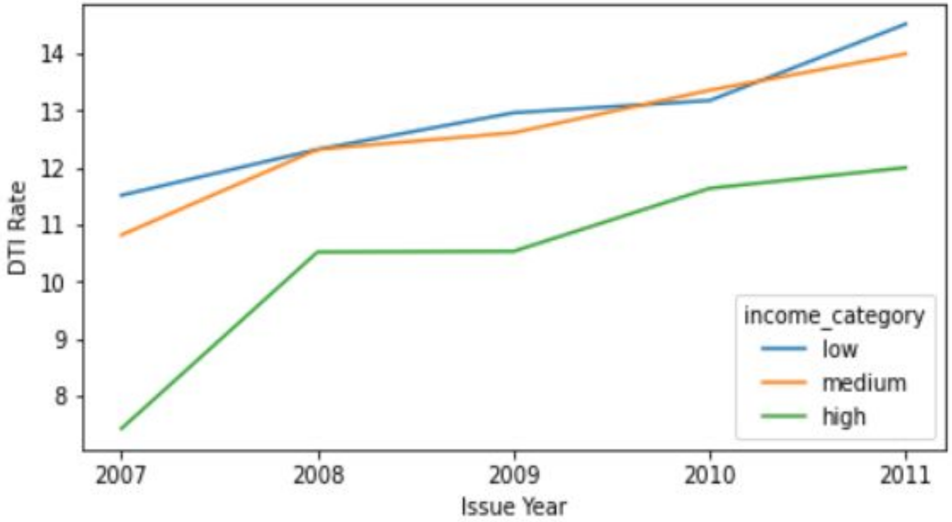


Chart 1

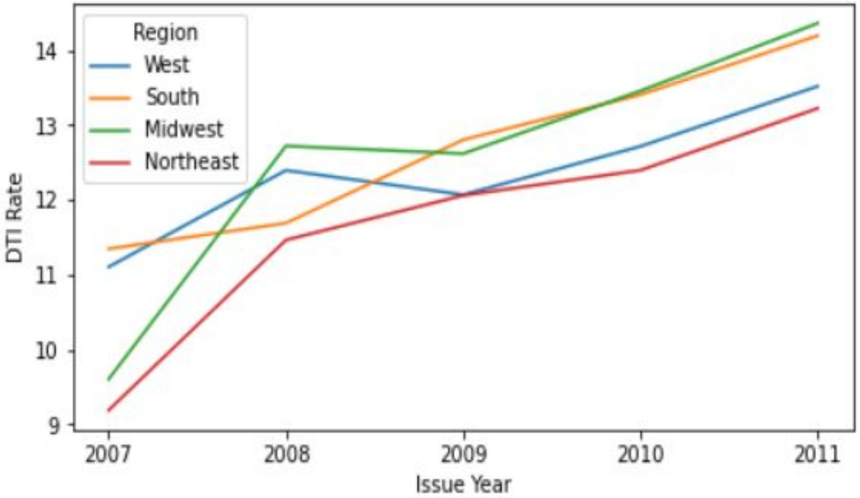


Chart 2

DTI Rate (Risk Assessment)

1. a high debt to income ratio is considered as a warning sing for the lenders or the investors when lending.
2. our 1st chart shows that the dti ratio of people with high income is too low compared to the dti ratio of the people with low and medium incomes
3. the dti rate is less for people in grade A and our earlier analysis on income group proved that people has a good credit score are generally from high income bracket. but for other credit grade score the dti is almost similar.
4. the dti rate has been increasing over the years, and the people of **northeast seem to have the best dti rate.**

Summary

1. Time/Period Analysis: we can expect an increase in number or loan applications and approvals every year.
2. Region Analysis: We have most number of defaulters coming from Western Region and most number of loans were approved for southern region.
3. Grade Analysis: Providing loan to a borrower with credit grade G could be risky as 50% of the borrowers default of this particular group.
4. Income & Emp length: People with low income are the ones with less work experience and the people with low income group default the most.
5. DTI rate: dti rate is negatively correlated with annual income of the employee, in the data people with high income has the best dti rate.
6. Most number of loans are applied by the people who has a medium annual income
7. People who live in mortgage and on rent tend to default as compared to homeowners.

Recommendations Basis the Analysis

1. If the purpose of the loan is debt consolidation, only approve this loan for people with a decent credit score and above average annual income.
2. If the applicant belongs to the western region, make necessary checks like his/her dti rate, income and public bankruptcies before approving the loan.
3. Avoid Approving bigger loans for the middle east region residentials as the annual income is the lowest in that region.
4. Approve loan for lower income person only if he/she has a good credit score.
5. DTI for South and Middle West Region is pretty high, and high DTI should be termed as **RISK.**
6. As Observed more people default if the interest rates are high, if this could be reduced by 1/2% the default rate can fall.
7. Providing Loans to People with living on mortgage or rent, the lending club should check the income and credit score of the individuals, checking DTI rate will not be of much help as it is almost the same across different homeowners.

THANKS!