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INTRODUCTION
REVIEW OF LITERATURE
NEED/IMPORTANCE OF THE STUDY
STATEMENT OF THE PROBLEM
OBJECTIVES
HYPOTHESIS (ES)
RESEARCH METHODOLOGY
RESULTS & DISCUSSION
FINDINGS
RECOMMENDATIONS/SUGGESTIONS
CONCLUSIONS
LIMITATIONS
SCOPE FOR FURTHER RESEARCH
REFERENCES
APPENDIX/ANNEXURE

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BOOKS

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–23

UNPUBLISHED DISSERTATIONS

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

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WEBSITES

- Garg, Bhavet (2011): Towards a New Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

PREDICTIVE ANALYTICS FOR CONSUMER LENDING: A STUDY ON LENDING CLUB

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ABSTRACT
Now a days Financial Technology (FinTech) is rapidly substituting the traditional capital-intensive business models, by expansible aggregative models, leveraging technology. The Research subject identified is to study the data from Lending Cub, the largest US based peer- to- peer lending organization, where traditional money lending business meets the modern peer- to- peer aggregative business processes. Lending Club offers loans to its customers at a lower cost than bank loan programs. By doing this, it helps in moving the savings to borrowers by charging a lower rate of interest. On the other hand, it provides the investors a solid return. This is why Lending Club has earned among the highest satisfaction ratings in the financial services industry. The data, which was subjected to the study, spans over 2013 to 2014, available to the public on the website of Lending Club. It has over 3,70,000 records with over 125 variables (factors) fields. Study was taken up as a Classification project with focus on employing modeling techniques with the help of these variables to predict loan default. By predicting loan default, Lending club can reduce the risk of default. Executed Logistic Regression model for significant variables identified using CART (Classification and Regression Tree)/Random Forest techniques and measured model performance using True Positive Rate, McFadden R^2 and AUC (Area under the Curve).

KEYWORDS
FinTech, logistic regression, CART, random forest, McFadden R^2.

JEL CODES
H81, E59.

INTRODUCTION
Today, the consumer lending market is huge, worth of $3 trillion and remained largely unreformed by technological innovation. Most people would go to receive their loan from traditional financial institutions such as banks, credit card companies, credit unions and invest in traditional stocks and bonds.
Lending Club was founded by Renaud Laplanche. It is world's largest online credit marketplace. It facilitates personal loans, business loans and elective medical procedures. Borrowers access lower interest rate loans through a fast and easy online or mobile interface. Investors provide the capital to enable many of the loans in exchange for earning interest. Their operation is fully online. They do not have any branch infrastructure. They use technology to lower cost and deliver an amazing experience. They pass the cost savings to borrowers in the form of lower rates and investors in the form of attractive returns. They are replacing the banking system into a transparent and highly efficient online marketplace, helping people achieve their financial goals every day.
Lending Club offers a simple, low cost, convenient and beneficial alternative to both borrowers and investors. They have facilitated billions of dollars in loans and built a trusted brand by delivering exceptional value and satisfaction to both borrowers and investors.

HOW IT WORKS
1. Customers interested in a loan complete a simple application at LendingClub.com
2. Lending Club leverage online data and technology to quickly assess risk, determine a credit rating and assign appropriate interest rates
3. Qualified applicants receive offers in just minutes and can evaluate loan options with no impact to their credit score
4. Individuals to institutions select loans in which to invest and can earn monthly returns

REVIEW OF LITERATURE
Herzenstein et al. (2008) focused on recent development of peer-to-peer lending industry in China. With the design of regional quality in mobile payment, this article constructs a multi-index evaluation system made by the current situation of economic and social foundation. By using principal component analysis, the article makes a comprehensive quantitative evaluation of quality and level of its development. Analysis results show that there are obvious gaps in the development of the P2P industry of China, which indicates the trend that peer-to-peer lending, will spread from developed regions to developing regions. Coordination between indicators and evaluation results are basically consistent with the evaluation results.
Riza Emekter et al. (2015) explored the P2P loan characteristics, evaluated their credit risk and measured loan performances. It was found that credit grade, debt-to-income ratio, FICO score and revolving line utilization play an important role in loan defaults. Loans with lower credit grade and longer duration are associated with high mortality rate. Finally, they found that higher interest rates charged on the high-risk borrowers are not enough to compensate for higher probability of the loan default. The Lending Club must find ways to attract high FICO score and high-income borrowers in order to sustain their businesses.
Carlos Serrano et al. (2015) studied P2P lending and the factors explaining loan default. This is an important issue because in P2P lending individual investors bear the credit risk, instead of financial institutions, which are experts in dealing with this risk. P2P lenders suffer a severe problem of information asymmetry, because they are at a disadvantage facing the borrower. For this reason, P2P lending sites provide potential lenders with information about borrowers and their loan purpose. They also assign a grade to each loan. Factors explaining default are loan purpose, annual income, current housing situation, credit history and indebtedness. The grade assigned by the P2P lending site is the most predictive factor of default, but the accuracy of the model is improved by adding other information, especially the borrower's debt level.
In this project, we focus on identify the set of important variables in the data set which significantly influence the 'default' status by visualization and data exploratory methods. Employ modeling techniques with the help of these variables to predict loan default and leverage the predictive model inferences to fine tune the select/reject process of loan applicants.

IMPORTANCE OF THE STUDY
Now a days financial services are steadily replacing the traditional money lending business. The money lending business meets the modern peer- to- peer aggregative business processes. Lending Club uses technology to operate in a credit marketplace at a lower cost than traditional bank loan programs, passing the savings on to borrowers in the form of low rate of interest and to investors in the form of good returns. By providing borrowers with better rates, and investors with attractive, risk-adjusted returns, Lending Club has earned among the highest satisfaction ratings in the financial services industry. The importance of this study is to make accurate default prediction from the data available at the time of application for the loan, so that the default rate can be reduced.

STATEMENT OF THE PROBLEM
Unlike in traditional lending, investors in P2P lending hold a higher credit risk, as they are not experts in the domain. They often lack the right information about the borrowers and the ability to make the right judgment on lending at the appropriate interest rate.
This study aims to bring out insights, which would help address issues, which both investors & borrowers face. While it targets to help borrowers to secure loans at the most competitive rates with least troubles, it would also help investors, to maximize returns minimizing risks, with data-driven inputs.

OBJECTIVES

1. Identify the set of important variables in the data which significantly influence the 'default' status by visualization and data exploratory methods.
2. Employ modeling techniques with the help of these variables to predict loan default.
3. Leverage the predictive model inferences to fine tune the select/reject process of loan applicants.

HYPOTHESIS

Null Hypothesis: Default status is not dependent on any of the following variables:

Variable	Description
Term	The number of payments on the loan. Values are in months and can be either 36 or 60.
Grade	LC assigned loan grade
installment	The monthly payment owed by the borrower if the loan originates.
last_pymnt_amnt	Last total payment amount received
loan_amnt	The listed amount of the loan applied for by the borrower. If at some point in time, the credit department reduces the loan amount, then it will be reflected in this value.
out_prncp	Remaining outstanding principal for total amount funded
total_rec_int	Interest received to date
total_rec_late_fee	Late fees received to date
total_rec_prncp	Principal received to date
Total_payment	Payments received to date for total amount funded

Alternate Hypothesis: Default status is dependent on one or many of the above variables.

RESEARCH METHODOLOGY

- The data which was subjected to the study spans over 2013 to 2014, available to the public on the website. Minimum Term is 36 months, so only fully serviced loans are considered. Loans sanctioned in 2015 and after that, status will be unknown. The data set has over 3,70,000 records with over 125 variables (factors) fields.
- Post cleaning the voluminous data, Visualization was carried out using Tableau, MS Excel & R
- Employed CART, Random Forest & Logistic Regression to identify significant variables and build models for predicting 'Default'
- The data was split into Train and Test datasets in a ratio of 60:40 to ascertain the stability of the models.

RESULTS & DISCUSSION

DATA VISUALIZATION

CHART # 1: AMOUNT OF LOANS DISBURSED FROM 2007 - 2014

Over years, there has been an exponential rise in the number and amount of loans disbursed by Lending club

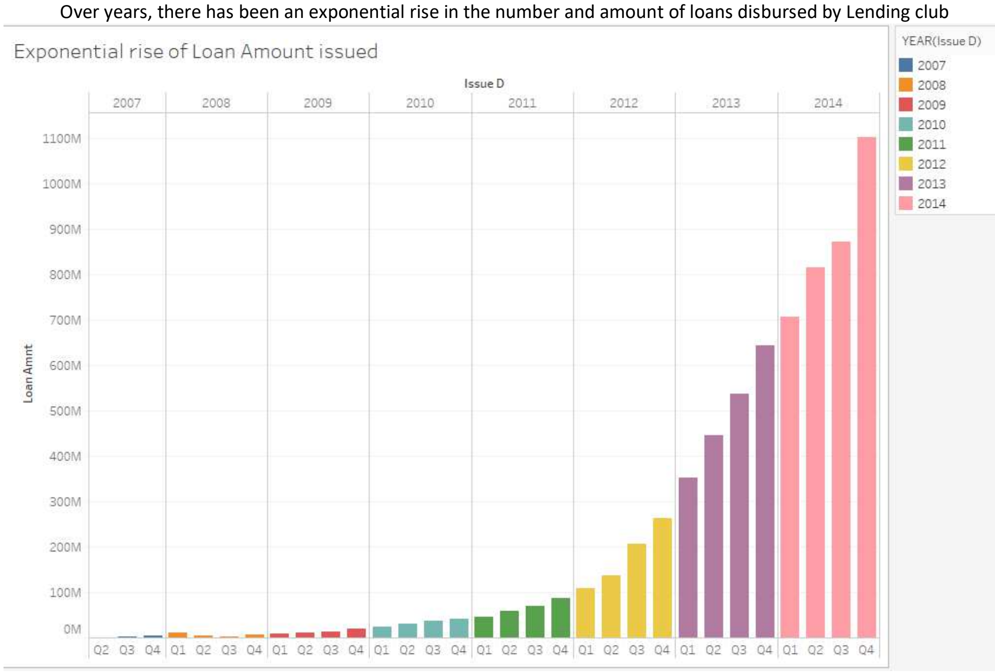


CHART # 2: LOANS DISBURSED DURING THE FESTIVE SEASON

As can be seen below, the loans issued before the festive months of November and October are the highest.

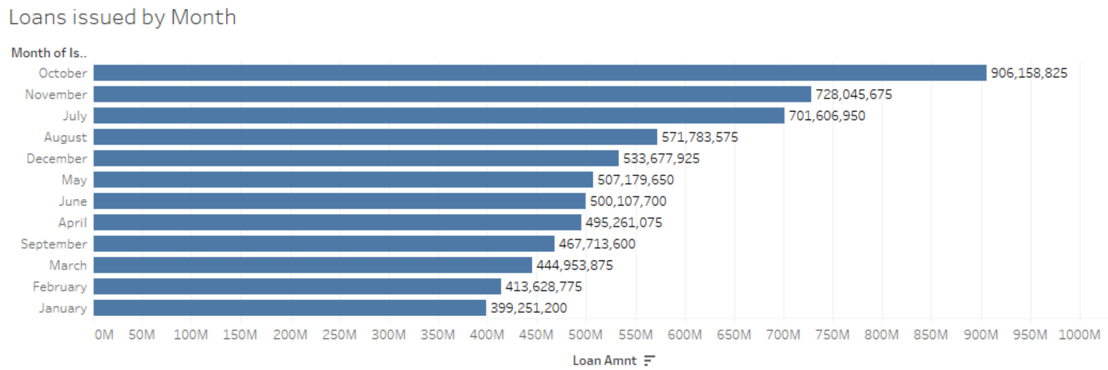


CHART # 3: *DEFAULT Vs TERM*

Loans with longer tenure has a higher default rate.

CHART # 4: *DEFAULT Vs GRADES*

Applicant in Grade G has the highest default rate. A has the lowest default rate.

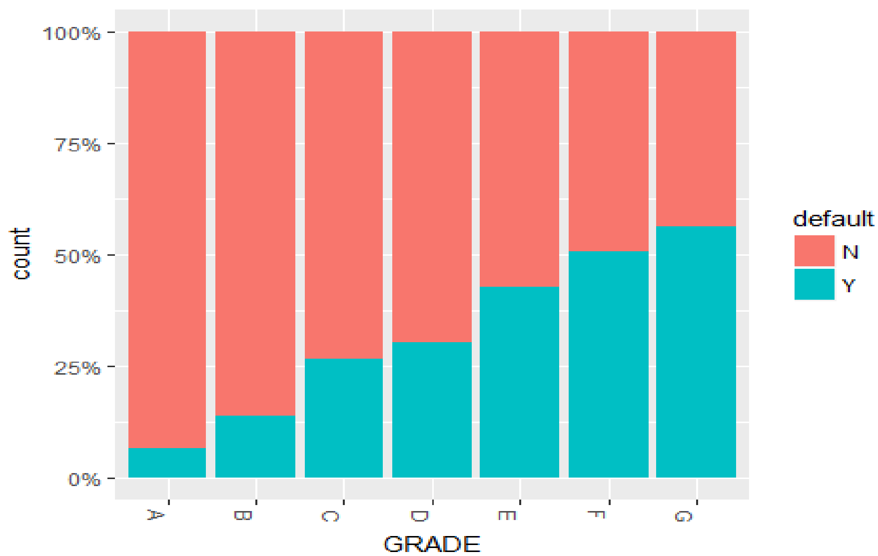


CHART # 5: *DEFAULT Vs LAST PAYMENT AMOUNT*

Borrower's having a low last paid amount have defaulted more compared to borrowers with a higher last paid amount.

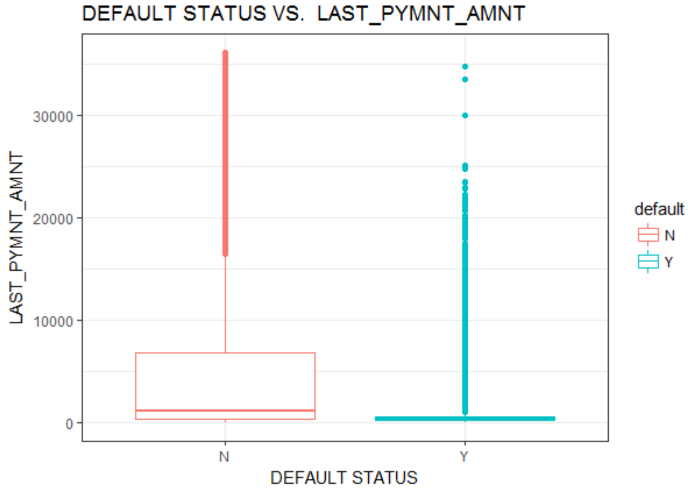


CHART # 6: *DEFAULT Vs LOAN AMOUNT*

Higher the loan amount higher the default rate.

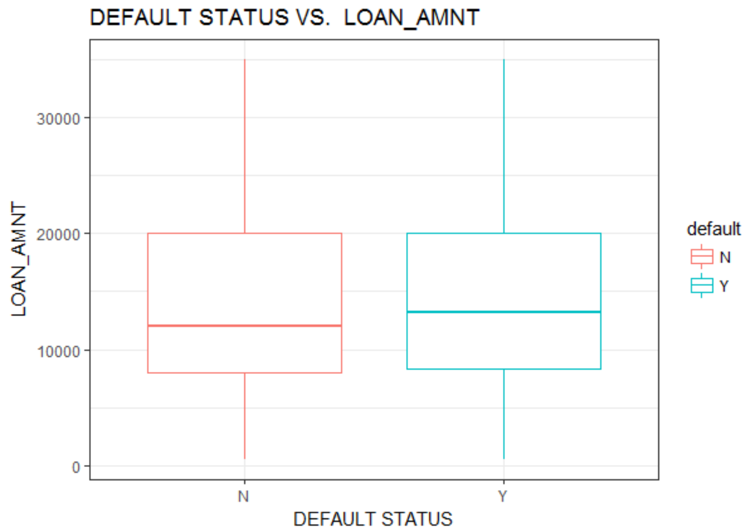


CHART # 7: *DEFAULT Vs OUTSTANDING PRINCIPAL*

No significant relationship observed.

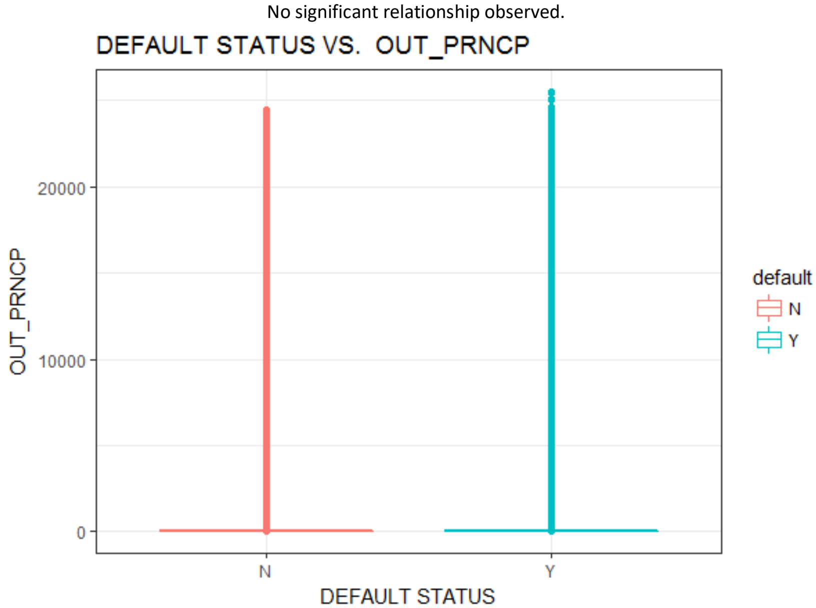


CHART # 8: *DEFAULT Vs TOTAL INTEREST RECEIVED*

No significant relation observed.

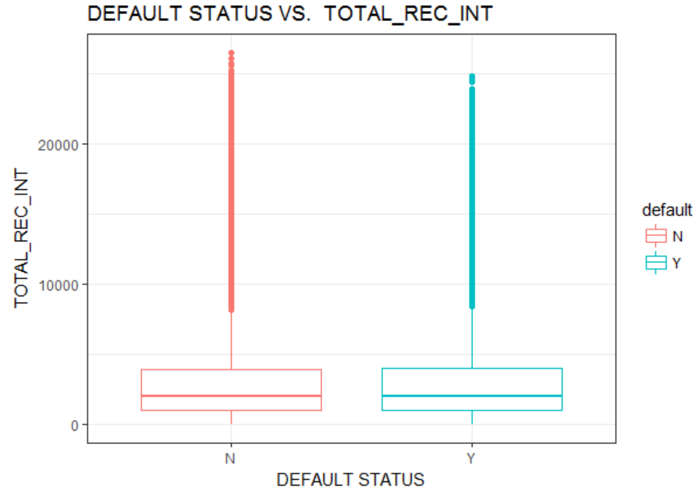


CHART # 9: *DEFAULT Vs TOTAL LATE FEE RECEIVED*

No significant relationship observed

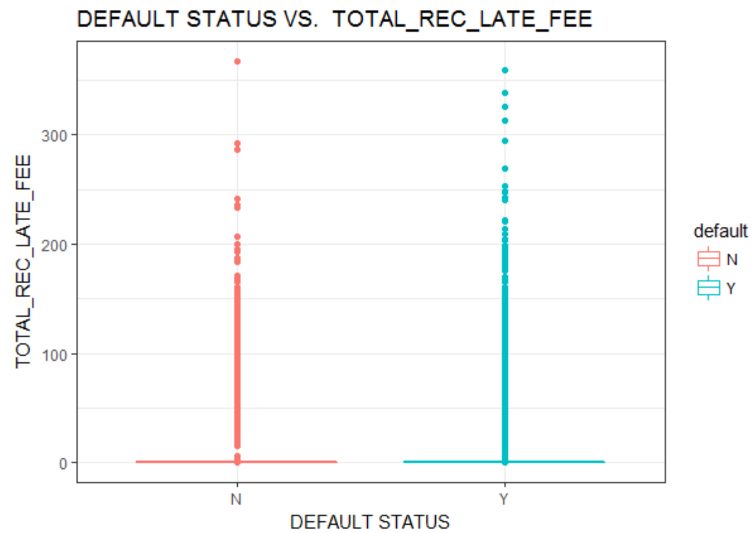


CHART # 10: *DEFAULT Vs TOTAL PAYMENT*

Higher the total payment less chance of default as per the chart below.

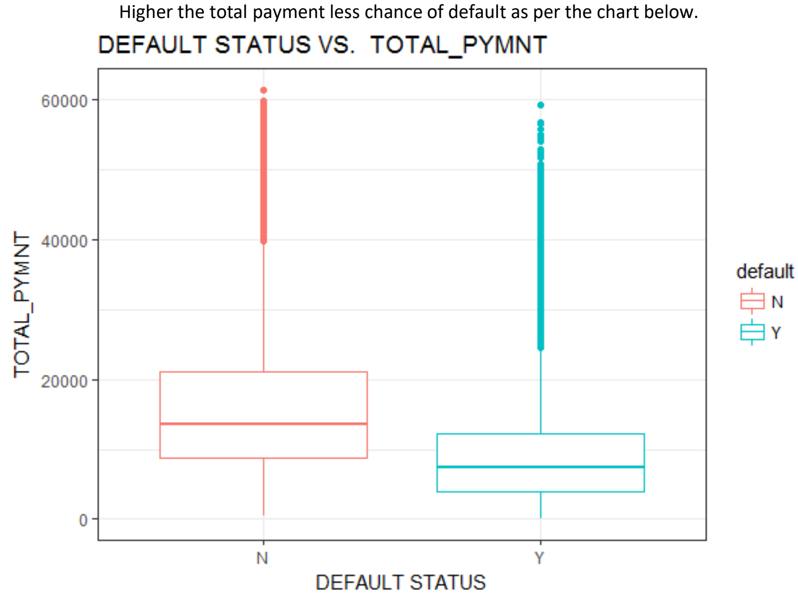


CHART # 11: *DEFAULT Vs TOTAL PRINCIPAL RECEIVED*

The higher the principal received the lower the chance of default. This relation is synonymous to the Total Payment.

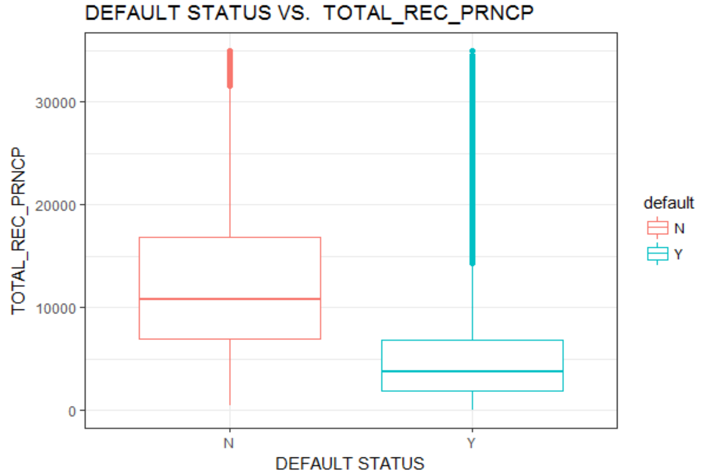
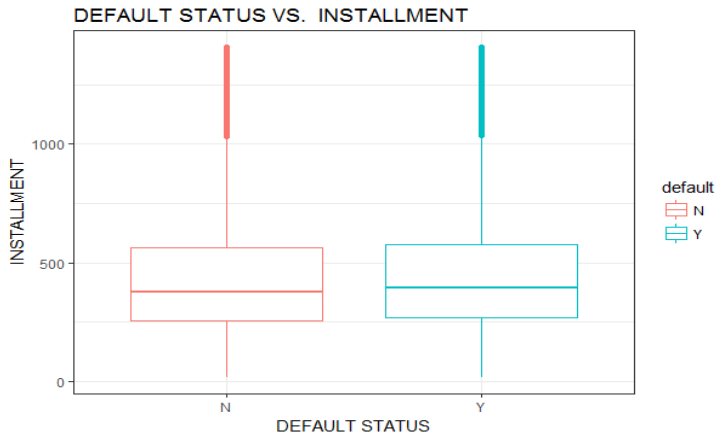


CHART # 12: *DEFAULT VS INSTALLMENT*

Defaulters have a slightly higher monthly installment.



Identify significant variables using CART (Classification and Regression Tree)

It is observed that the predictive power of the variables is not consistent over the years, which indicates that Lending Club continued to improve the model. It is seen that Lending Club using the data that they started accumulating on the loan repayment behavior of the borrower.

TABLE 1

Year Groups	**2013-14**	
Variables	installment	
	last_pymnt_amnt	
	loan_amnt	
	out_prncp	
	sub_grade	
	term	
	total_pymnt	
	total_rec_int	
	total_rec_late_fee	
	total_rec_prncp	
Confusion Matrix	**Predict**	
Train		
Default	**0**	**1**
0	187005	325
1	3383	31318
Accuracy	98%	
Sensitivity	90%	
Specificity	100%	
Test		
Default	**0**	**1**
0	124501	386
1	2421	20713
Accuracy	98%	
Sensitivity	90%	
Specificity	100%	
AUC	0.9829	
KS	0.9064	
GINI	0.8149	

RANDOM FOREST MODEL

Executed Random Forest model for the same set to corroborate the significant variables and the results are in line with those identified using CART.

TABLE 2

	2013-14	
Train	**Predict**	
Default	**0**	**1**
0	187281	49
1	3698	31003
Accuracy	98%	
Sensitivity	89%	
Specificity	100%	
Test	**Predict**	
Default	**0**	**1**
0	124844	43
1	2540	20594
Accuracy	98%	
Sensitivity	89%	
Specificity	100%	
GINI	86%	
AUC	99%	
KS	92%	

LOGISTIC REGRESSION MODEL

Using the variables identified using CART/Random Forest models, Logistic Regression model was executed.

- The modeling set was split into two parts -60% modeling data and 40% validation data. Logistic Regression was executed on modeling data
- Using the ***glm*** function in R, identified the variables with maximum '***p***' values
- Checked the variable importance using the ***varImp*** function of ***caret*** package and calculated the Log-Odds ratio
- Based on all three, the resulting significant predictors were identified

TABLE 3

Variable	p-value	varImp	Odds	Probability
installment	<2e-16	26.82913	5	83.34%
total_rec_late_fee	<2e-16	24.54581	38.67	97.50%
last_pymnt_amnt	<2e-16	19.91708	0.91	47.60%
total_rec_prncp	<2e-16	18.57044	0.11	9.70%
loan_amnt	<2e-16	18.11091	8.79	89.78%
term 60 months	6.11e-14	7.505634	1.97	66.33%
gradeC	1.51e-06	4.809319	1.5	59.97%
gradeG	5.83e-05	4.019788	0.4	28.59%
gradeF	0.000259	3.653006	0.54	35.02%
gradeB	0.005557	2.772832	1.26	55.70%
total_rec_int	0.015469	2.421219	0.99	49.92%
gradeE	0.094209	1.6736	0.81	44.89%
gradeD	0.289937	1.058259	1.11	52.55%
Out_prncp	<2e-16	18.270244	0.11	10.03%

TABLE 4

Train	**Predict**	
Default	**0**	**1**
0	187248	82
1	3582	31119
Accuracy	98%	
Sensitivity	90%	
Specificity	100%	
Test	**Predict**	
Default	**0**	**1**
0	124816	71
1	2338	20796
Accuracy	98%	
Sensitivity	90%	
Specificity	100%	
McFadden R^2	85%	
AUC	98%	
KS	90%	

INSIGHTS AND INFERENCES

In this section interpretation of the McFadden R^2 of the Logistic Regression model and log odds of the significant factors are made.

For the interpretation purpose, it is focused on the model executed for 2013-14 years as this will be the base for any current or future modeling.

Based on the McFadden R^2 of 85%, it is concluded that 85% of the uncertainty of the intercept only model has been explained by this full model. Thus the goodness of fit is excellent.

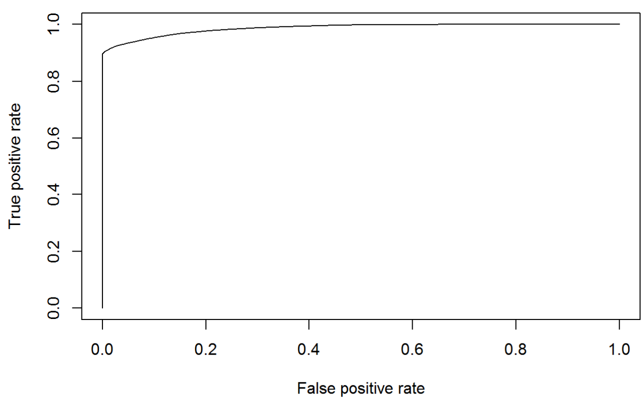
TABLE 5

Variable	Odds	Probability	Interpretation
Installment	5	83.34%	If the monthly installment for a borrower increases by $100, then the odds of him defaulting increase by 5 times and the probability of default is 83.34%
total_rec_late_fee	38.67	97.50%	If the late fee paid by the borrower increases by $100, then the odds of him defaulting increase by 38.67 times and probability of default is 97.50%
last_pymnt_amnt	0.91	47.60%	If the last paid amount by the borrower increases by $100, then the odds of him defaulting decrease by 0.91 times and probability of default is 47.60%
total_rec_prncp	0.11	9.70%	If the total principal amount returned by the borrower increases by $100, then the odds of him defaulting decrease by 0.11 times and probability of default is 9.70%
loan_amnt	8.79	89.78%	If the loan amount requested by the borrower increases by $100, then the odds of him defaulting increase by 8.79 times and probability of default is 89.78%
term 60 months	1.97	66.33%	If the tenure of loan opted by the borrower is 60 months then his odds of defaulting increases by 1.97 times compared to 30 months tenure and probability of default is 66.33%
gradeC	1.5	59.97%	The odds of defaulting increases by 1.5 times for a borrower classified in grade C compared to grade A borrower and probability of default is 59.97%
gradeB	1.26	55.70%	The odds of defaulting increases by 1.26 times for a borrower classified in grade B compared to grade A borrower and probability of default is 55.70%
total_rec_int	0.99	49.92%	If the total interest amount returned by the borrower increases by $100, then the odds of him defaulting decrease by 0.99 times and probability of default is 49.92%
gradeD	1.11	52.55%	The odds of defaulting increases by 1.11 times for a borrower classified in grade D compared to grade A borrower and probability of default is 52.55%
Out_prncp	0.11	10.03%	If the outstanding principal decreases by $100, then the odds for a borrower defaulting decreases by 0.11times and probability of default is 10.03%

ROC CURVE

The ROC curve shows high True positivity, and Area Under Curve of 98%, which again shows that this is a good model. Area under the curve measures the discrimination, the ability of the model to correctly classify the borrower who will default or not default.

GRAPH 1



CONCLUSION

Lending Club can use the significant factors identified to fine tune the model used for accepting or rejecting the loan applicants so that the number of defaulters reduce. This will benefit the investors.

Lending Club can devise a floating interest rate that will award the borrowers based on their behavior by reducing the interest rate, which can lead to reduction in defaulters.

REFERENCES

1. Business Statistics, A First Course – book co-authored by Dr. P K Viswanathan
2. Carlos Serrano-Cinca, Begoña Gutiérrez-Nieto, Luz López-Palacios 2015 Determinants of Default in P2P Lending Published: October 1, 2015, https://doi.org/10.1371/journal.pone.0139427
3. Herzenstein M, Andrews RL, Dholakia UM, Lyandres E (2008) The democratization of personal consumer loans? Determinants of success in online peer-to-peer lending communities. Boston University School of Management Research Paper 14.
4. https://en.wikipedia.org/wiki/List_of_U.S._states_by_income
5. https://www.analyticsvidhya.com/blog/2016/02/7-important-model-evaluation-error-metrics/
6. Lending Club blogs – http://blog.lendingclub.com and http://www.lendacademy.com
7. Riza Emekter, Yanbin Tu, Benjamas Jirasakuldech & Min Lu 2015 Evaluating credit risk and loan performance in online Peer-to-Peer (P2P) lending Applied Economics Vol. 47, Iss. 1,2015.
8. Stack Overflow – www.stackoverflow.com

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