Evaluating Performing and Non-Performing Loans at Lending Club

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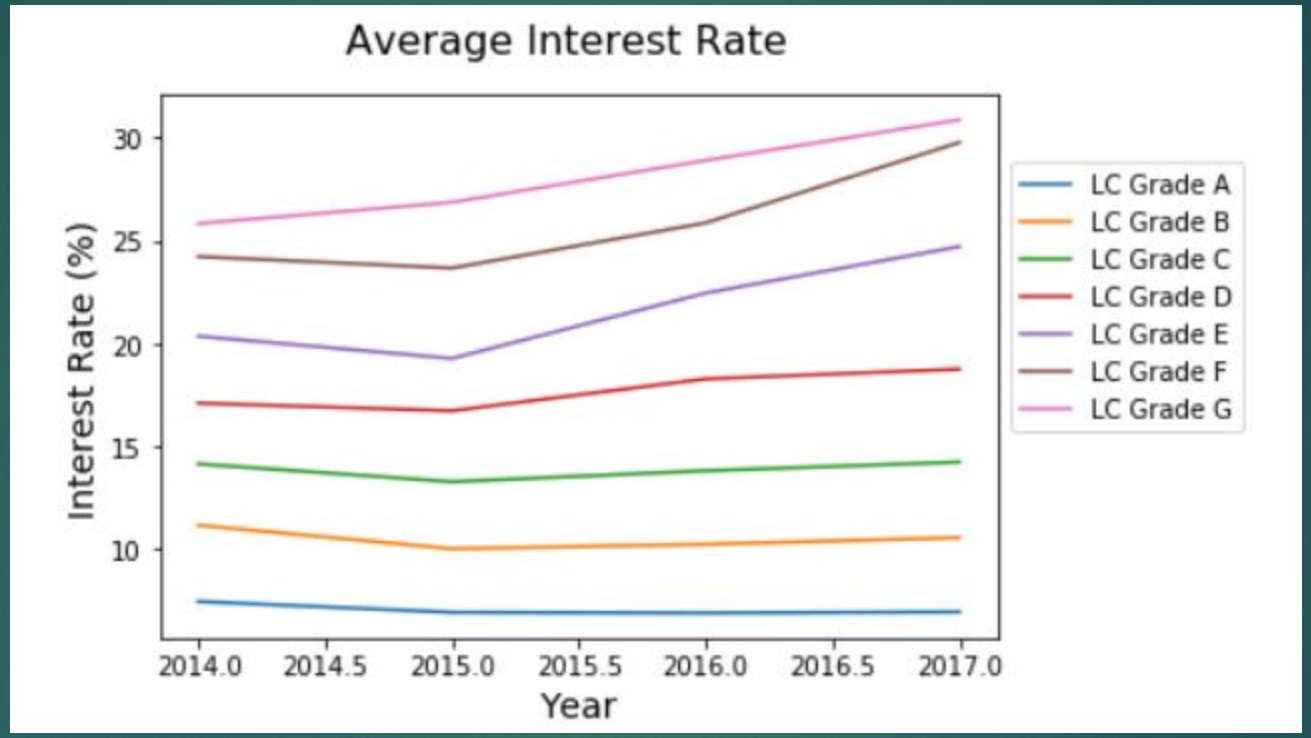
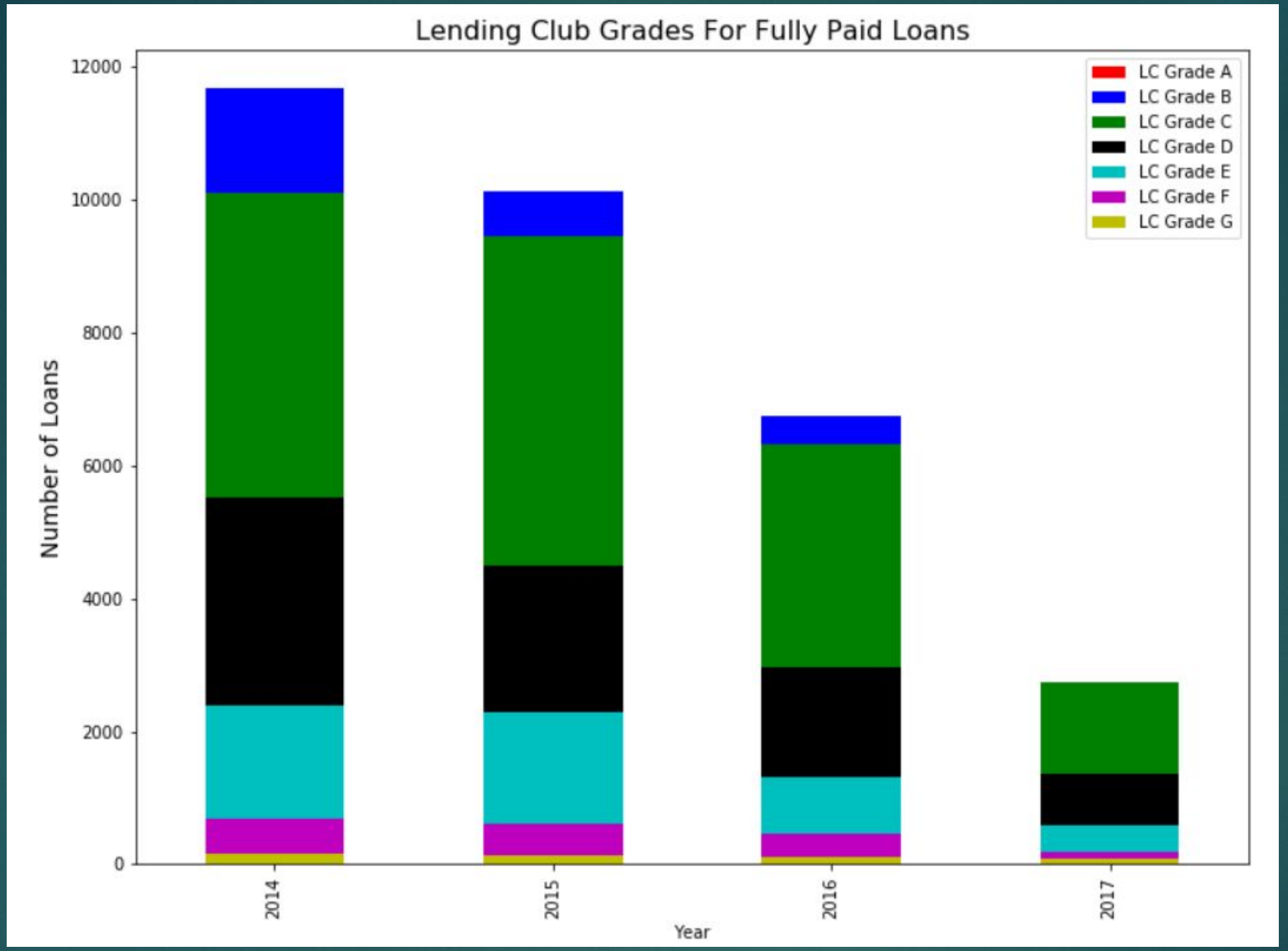
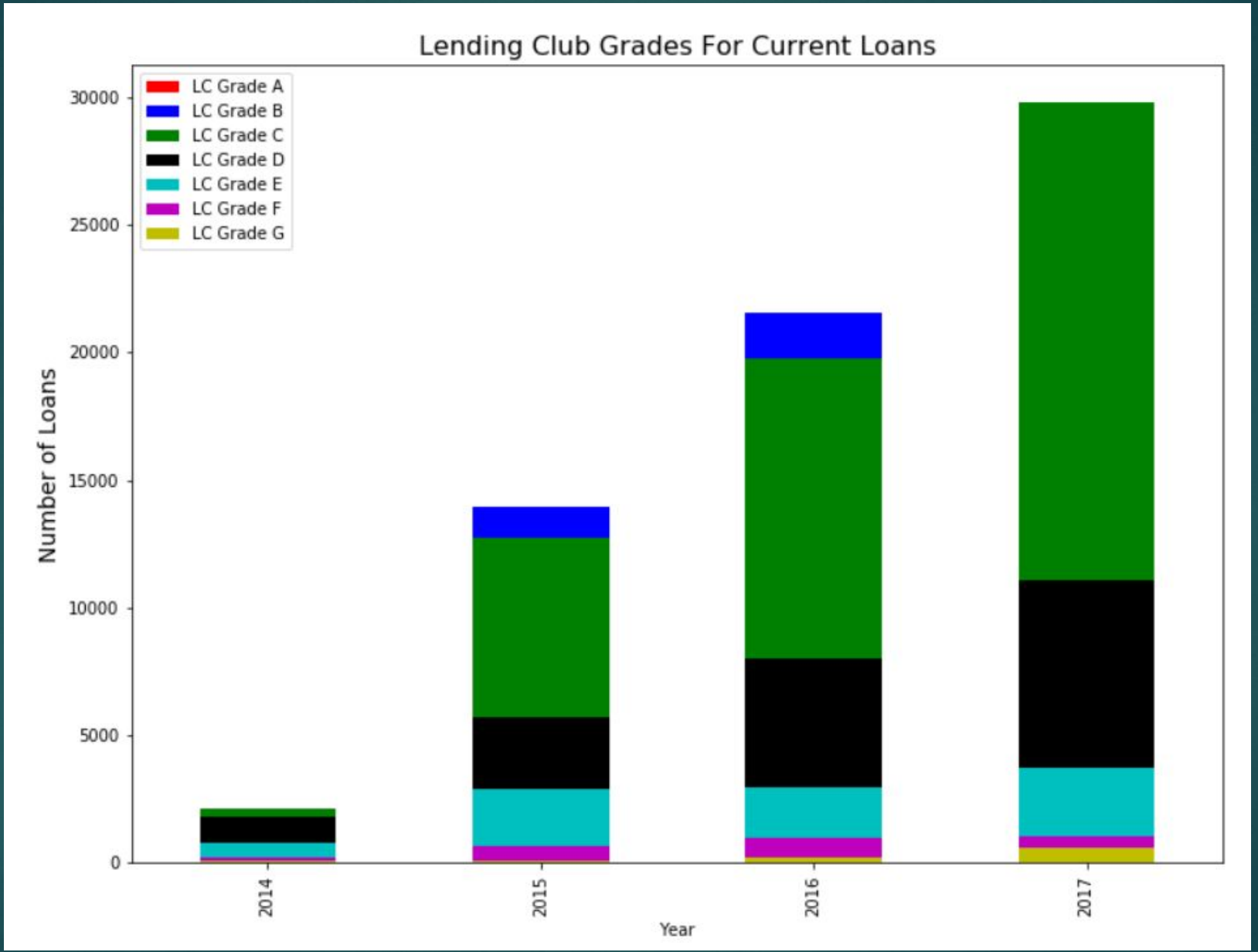
Introduction

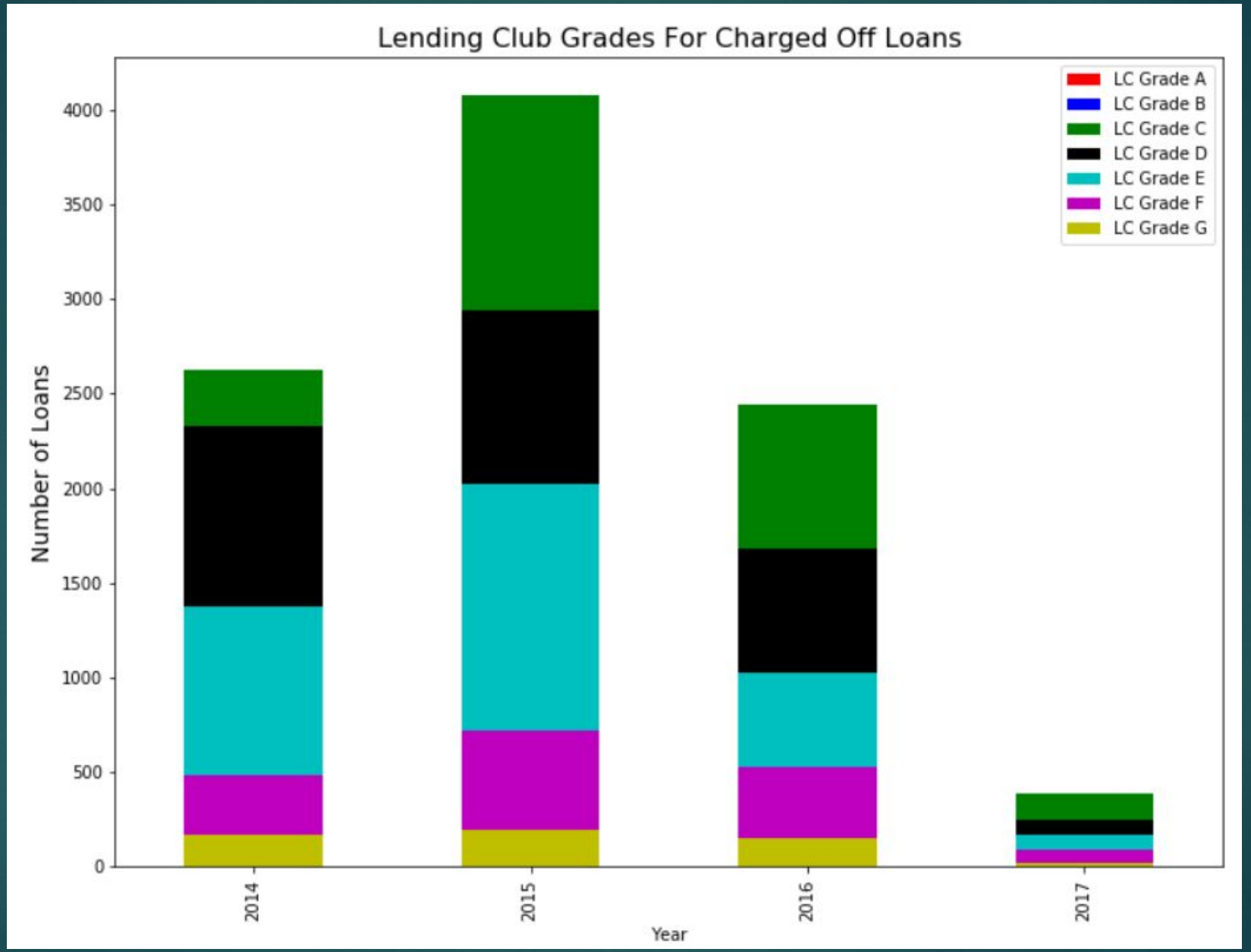
- I will be analyzing 6 loan variants in Northeastern states from 2014-2017. They are fully paid, current, charged off, late, default, and in grace period loans. Current loans are defined as having one or more payments completed and no payments past due. It also means that this loan still has one or more scheduled future payments. Defaulted loans have one or more payments that are overdue for over 90 days. After debt collection agencies completed their task and no further action to the loan can be done, then the loan is considered 'charged off'. Loans are considered late when one or more payments of a loan are overdue within 3-31 days or 31-91 days. In grace period indicates a loan has become due.
- I will also provide correlations and relevant predictions from my analysis.
- Source of Data: All Lending Club Data from Kaggle

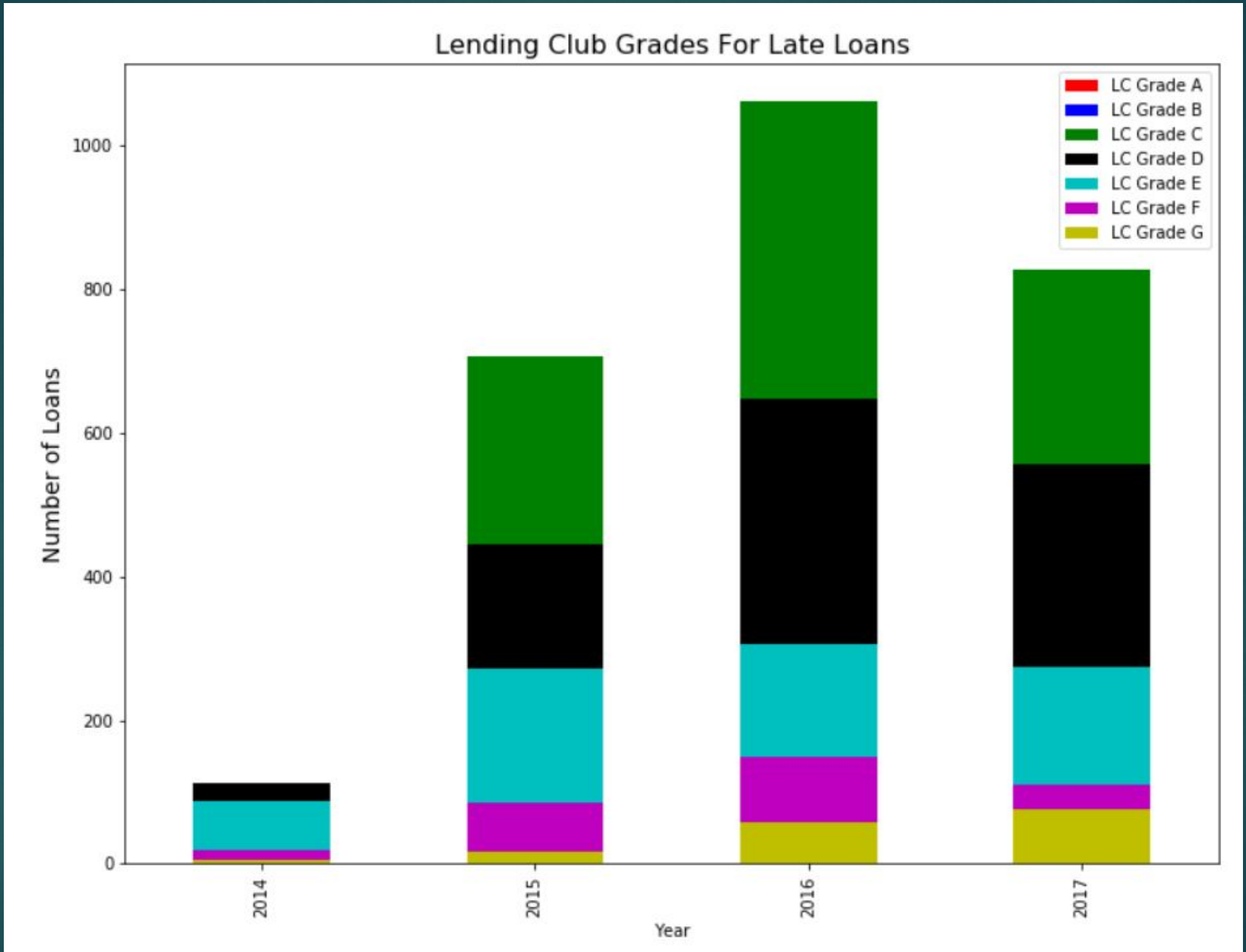


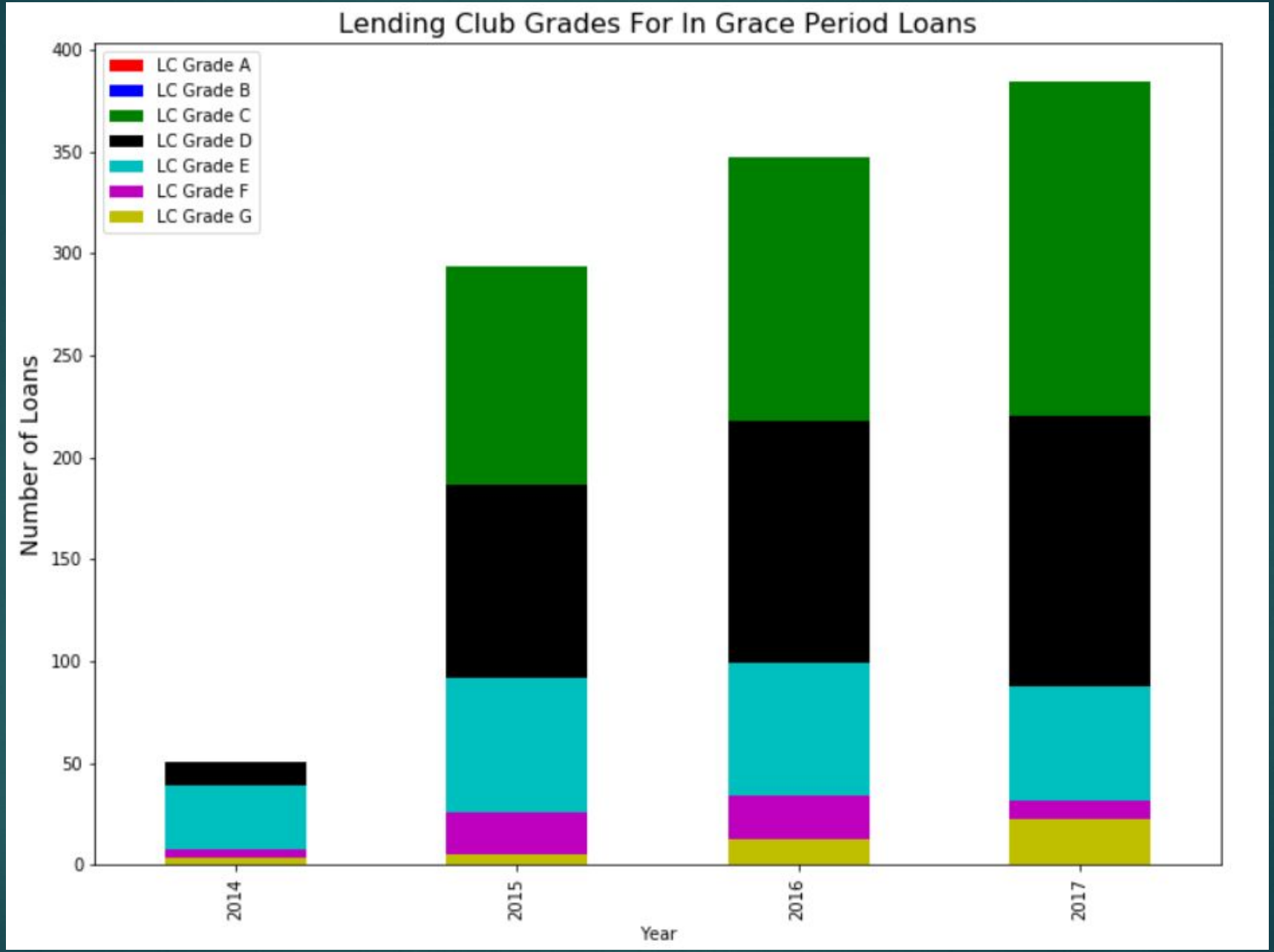
Average Interest Rate is negatively correlated with Lending Club assigned grades especially for grades A-D.

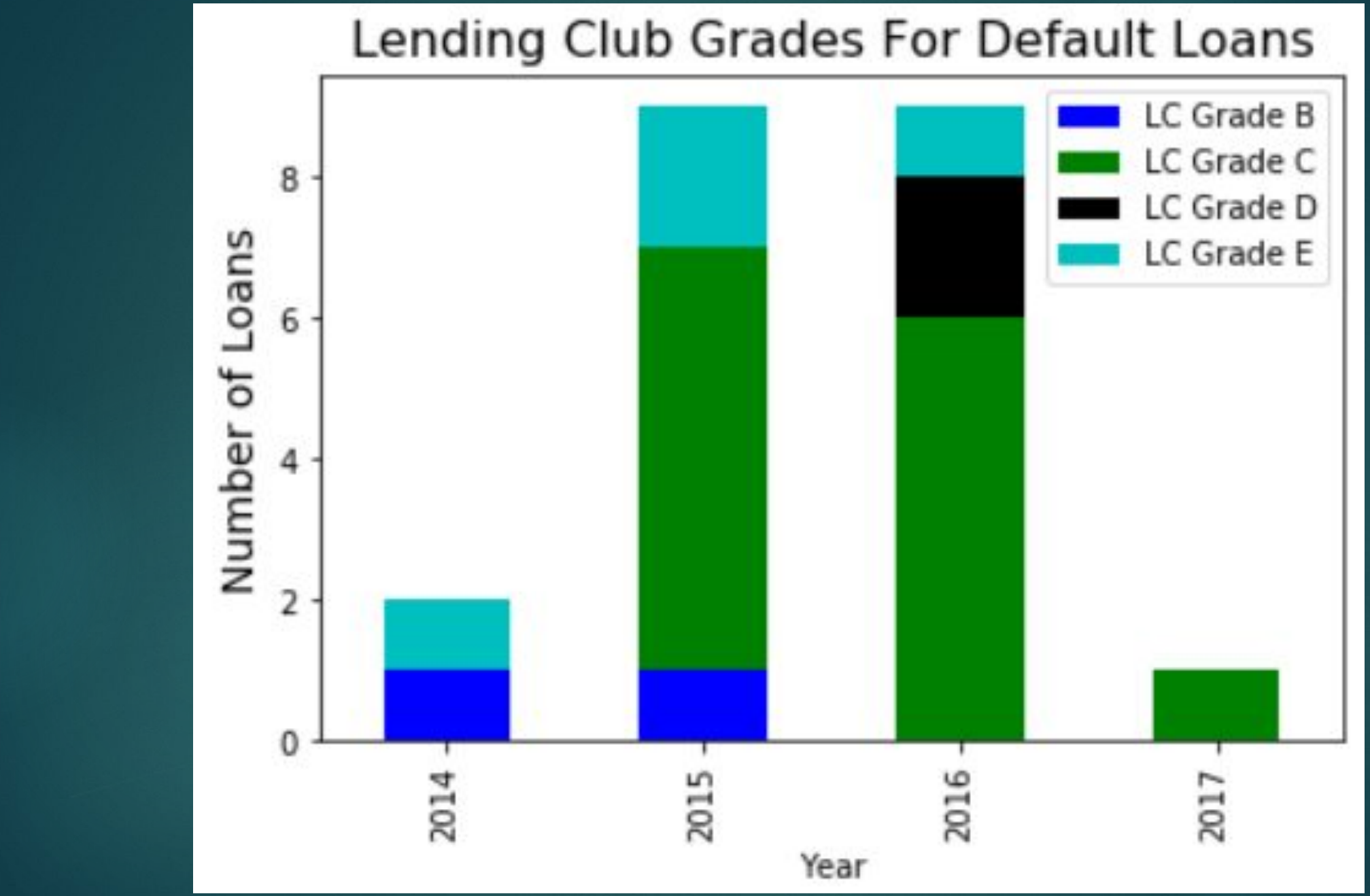

Lending Club Grades For Fully Paid Loans
LC Grade A
LC Grade B
LC Grade C
LC Grade D
LC Grade E
LC Grade F
LC Grade G
Number of Loans
12000
10000
8000
6000
4000
2000
0
2014
2015
2016
2017
Year


Lending Club Grades For Current Loans
LC Grade A
LC Grade B
LC Grade C
LC Grade D
LC Grade E
LC Grade F
LC Grade G
Number of Loans
30000
25000
20000
15000
10000
5000
0
2014
2015
2016
2017
Year

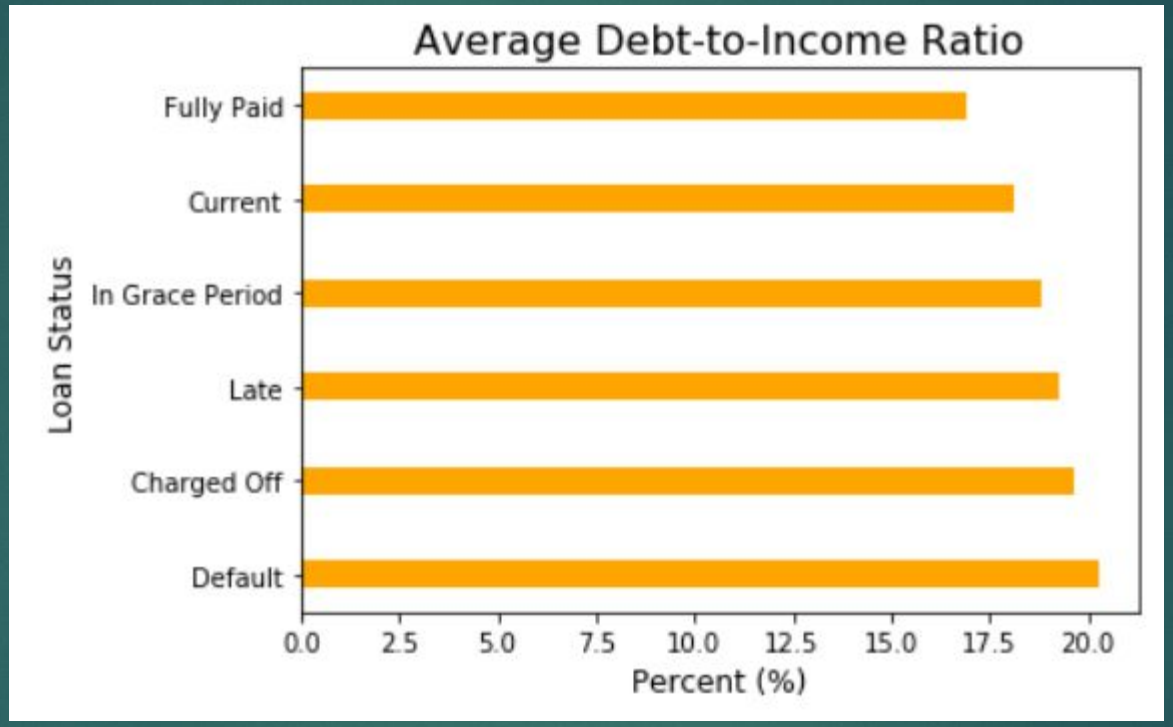

Lending Club Grades For Charged Off Loans
LC Grade A
LC Grade B
LC Grade C
LC Grade D
LC Grade E
LC Grade F
LC Grade G
Number of Loans
0
500
1000
1500
2000
2500
3000
3500
4000
2014
2015
2016
2017
Year


Lending Club Grades For Late Loans
LC Grade A
LC Grade B
LC Grade C
LC Grade D
LC Grade E
LC Grade F
LC Grade G
Number of Loans
0
200
400
600
800
1000
2014
2015
2016
2017
Year

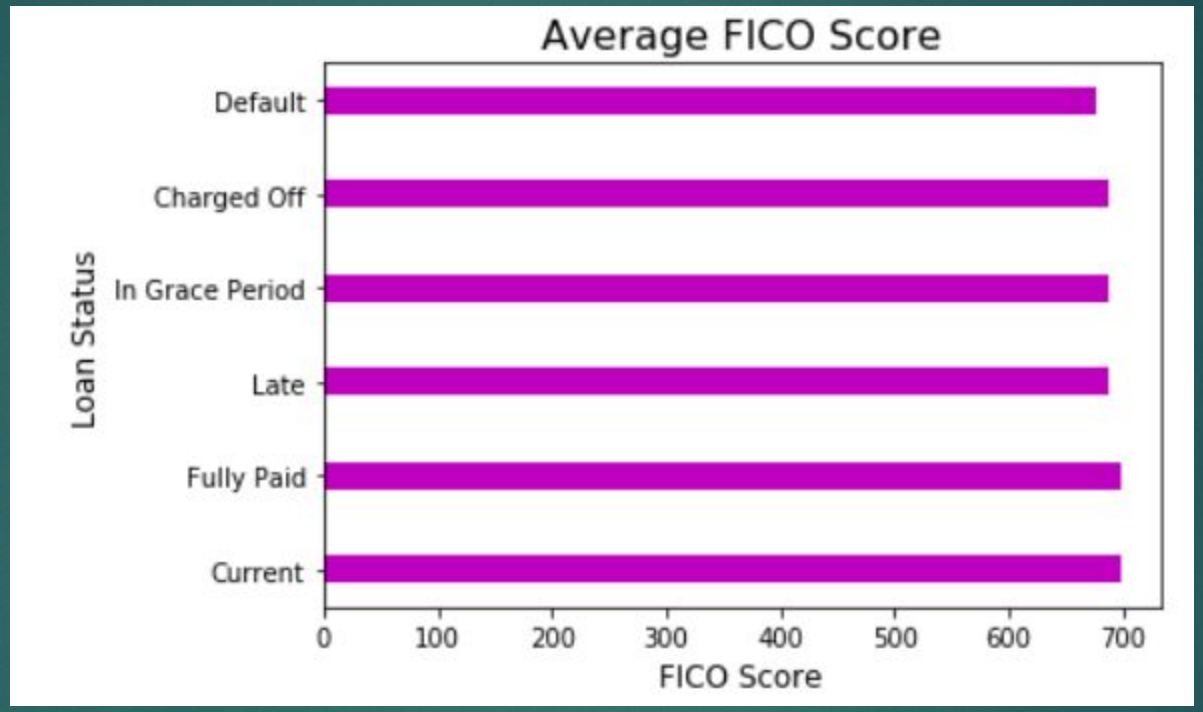

Lending Club Grades For In Grace Period Loans
LC Grade A
LC Grade B
LC Grade C
LC Grade D
LC Grade E
LC Grade F
LC Grade G
Number of Loans
0
50
100
150
200
250
300
350
400
2014
2015
2016
2017
Year


Lending Club Grades For Default Loans
LC Grade B
LC Grade C
LC Grade D
LC Grade E
Number of Loans
0
2
4
6
8
2014
2015
2016
2017
Year

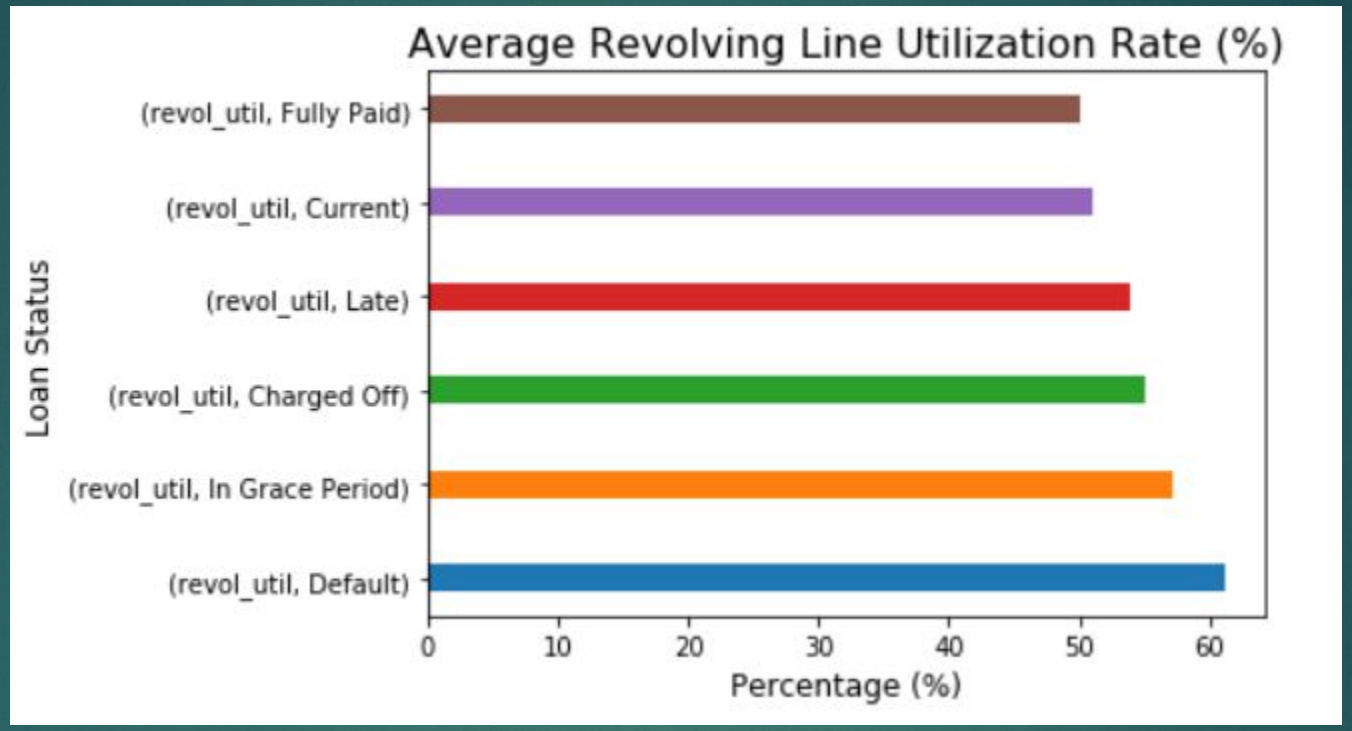
- Most of the fully paid and current loans are grade C. Current and fully paid loans have a higher distribution of better grades. In fact, charged off, in grace period, and late loans never had a portion of As or Bs.
- Fully paid loans have decreased drastically largely due to the significant increase of current loans. I predict this will continue to occur in the future.
- Most of the charged off loans started off with grades D&E and ended with a more even distribution of grades C-F.
- Most of the late loans are grades C-E. Most of the in grace period loans are grades C&D.
- Surprisingly, default loans have the smallest number of loan variants in single digits. Initially, the default loans were grade B and E loans and then the grade C loans become predominant since 2015.



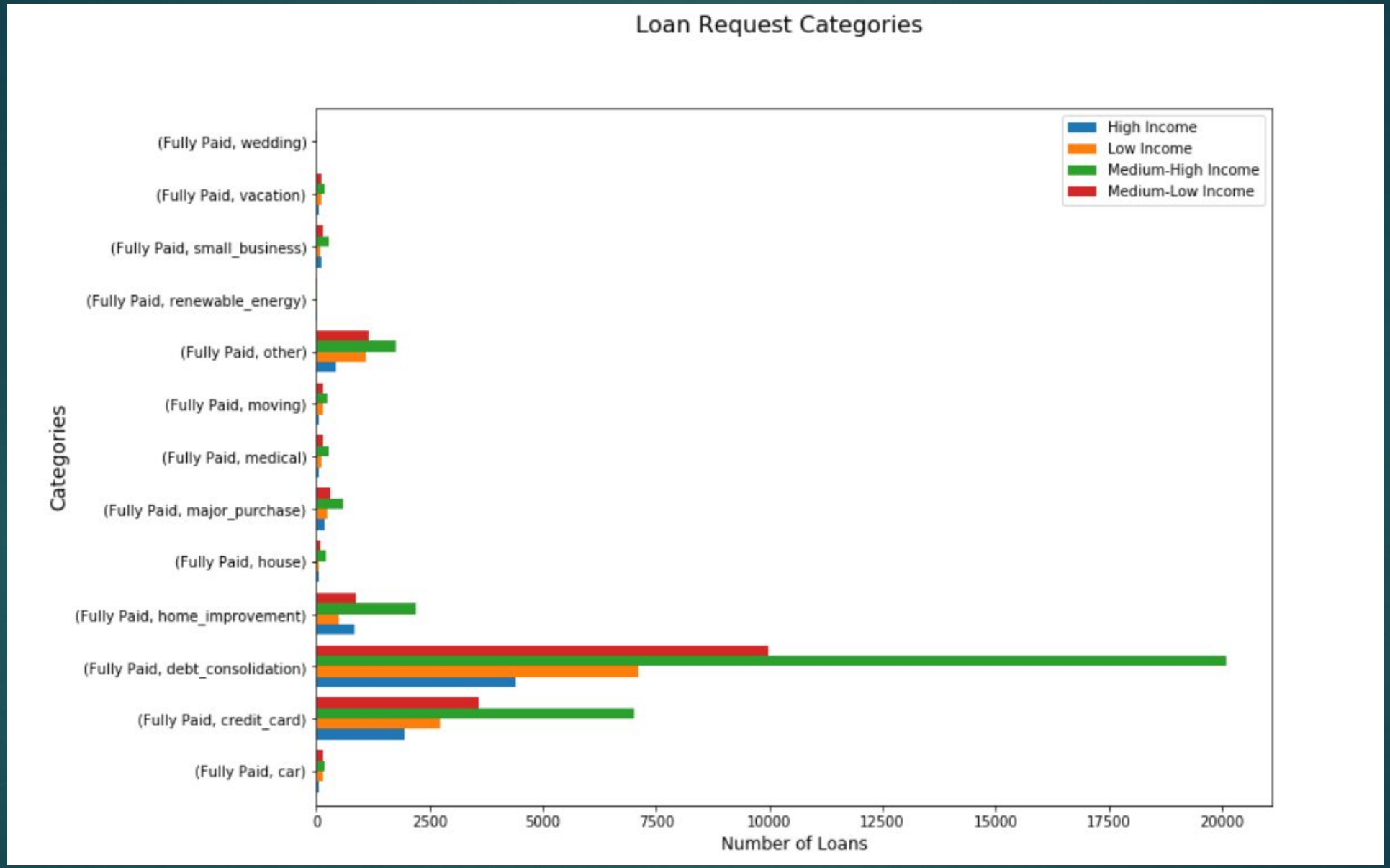
Default and charged off loans have the highest dti while fully paid and current loans have the lowest which validates my literature review. Good status loans are associated with lower dti and vice versa.

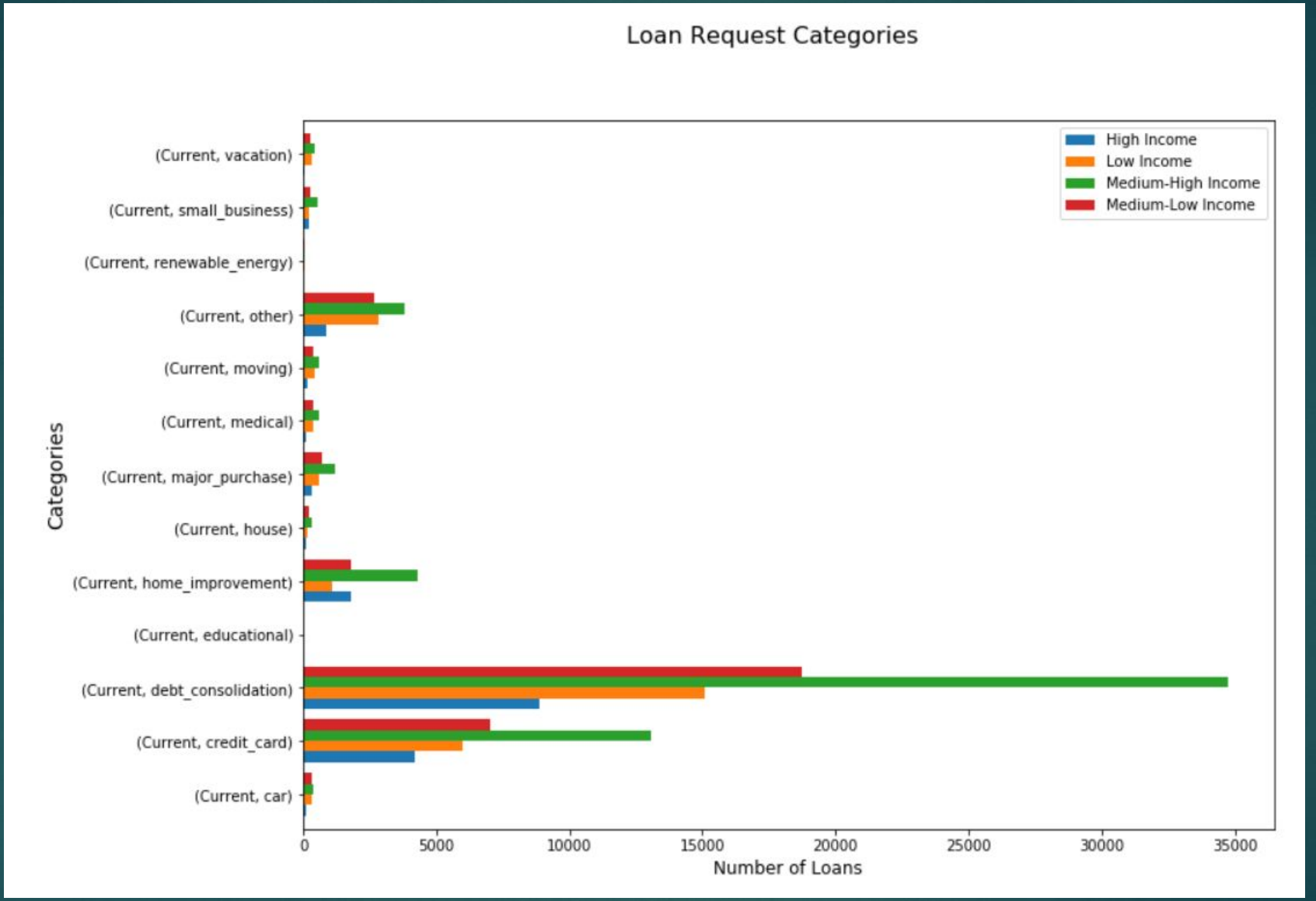


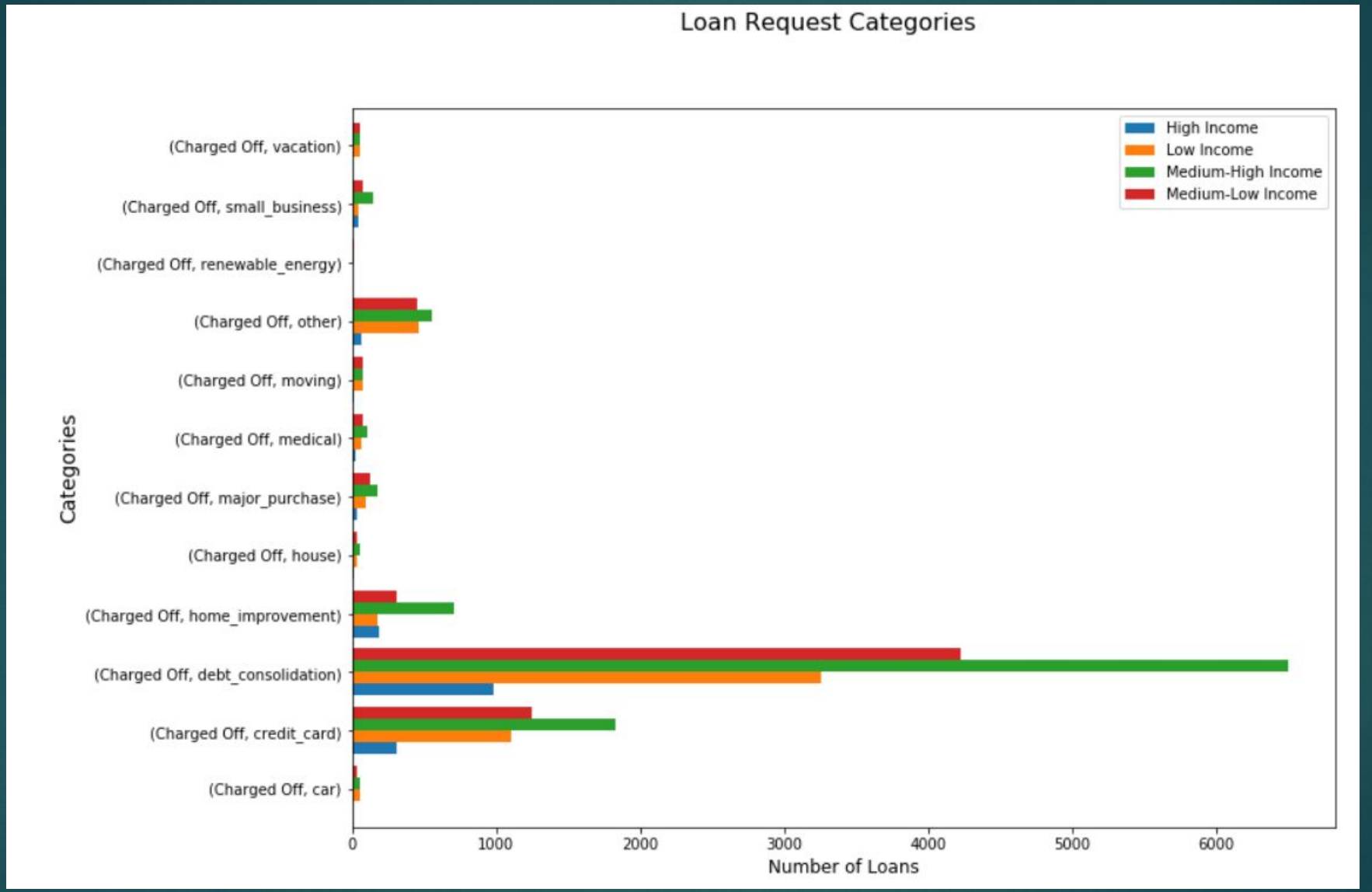
Lending Club offered no loans for poor FICO scores during this time period. Default and charged off loans have the lowest average FICO score while fully paid and current loans have the highest.

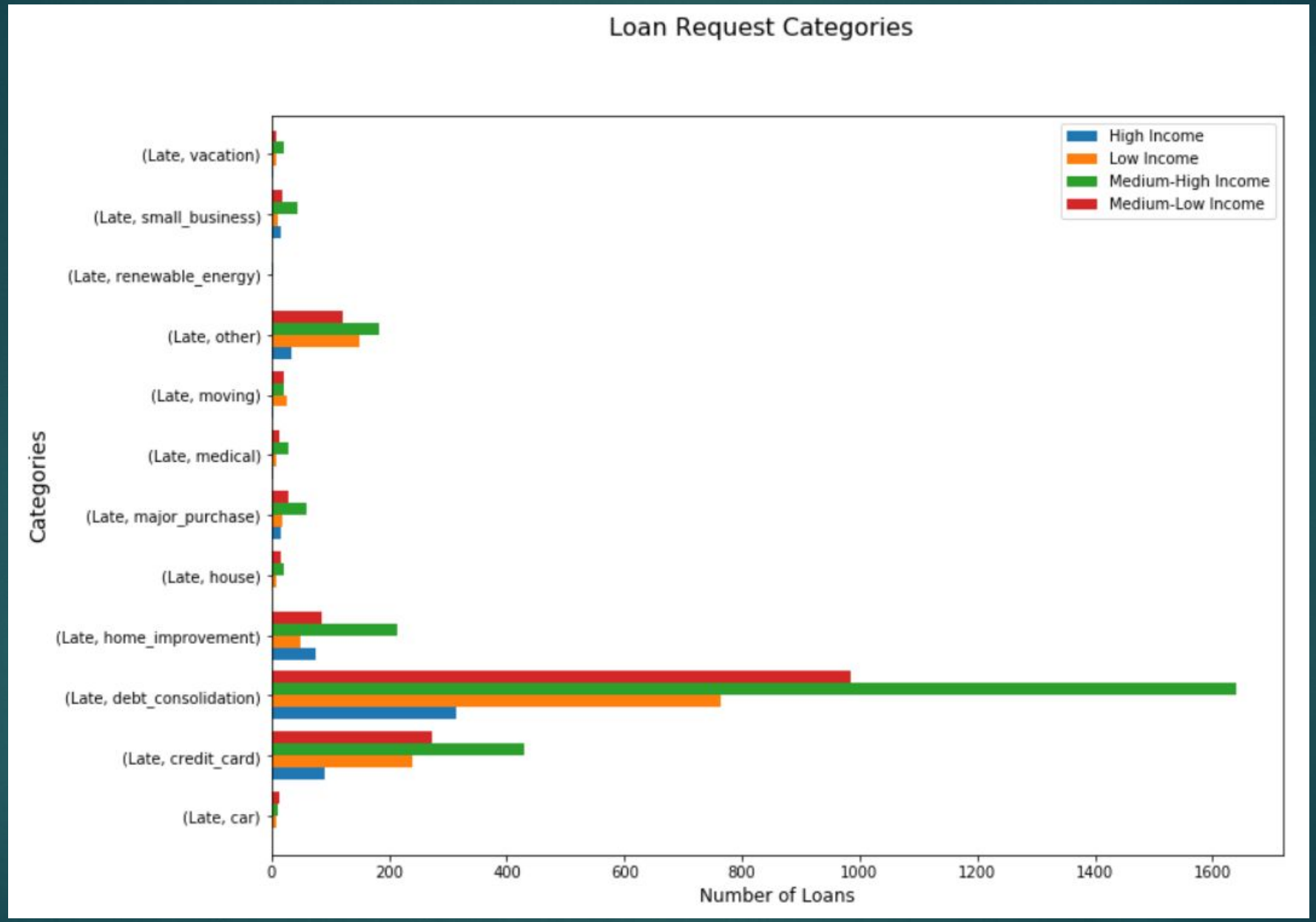


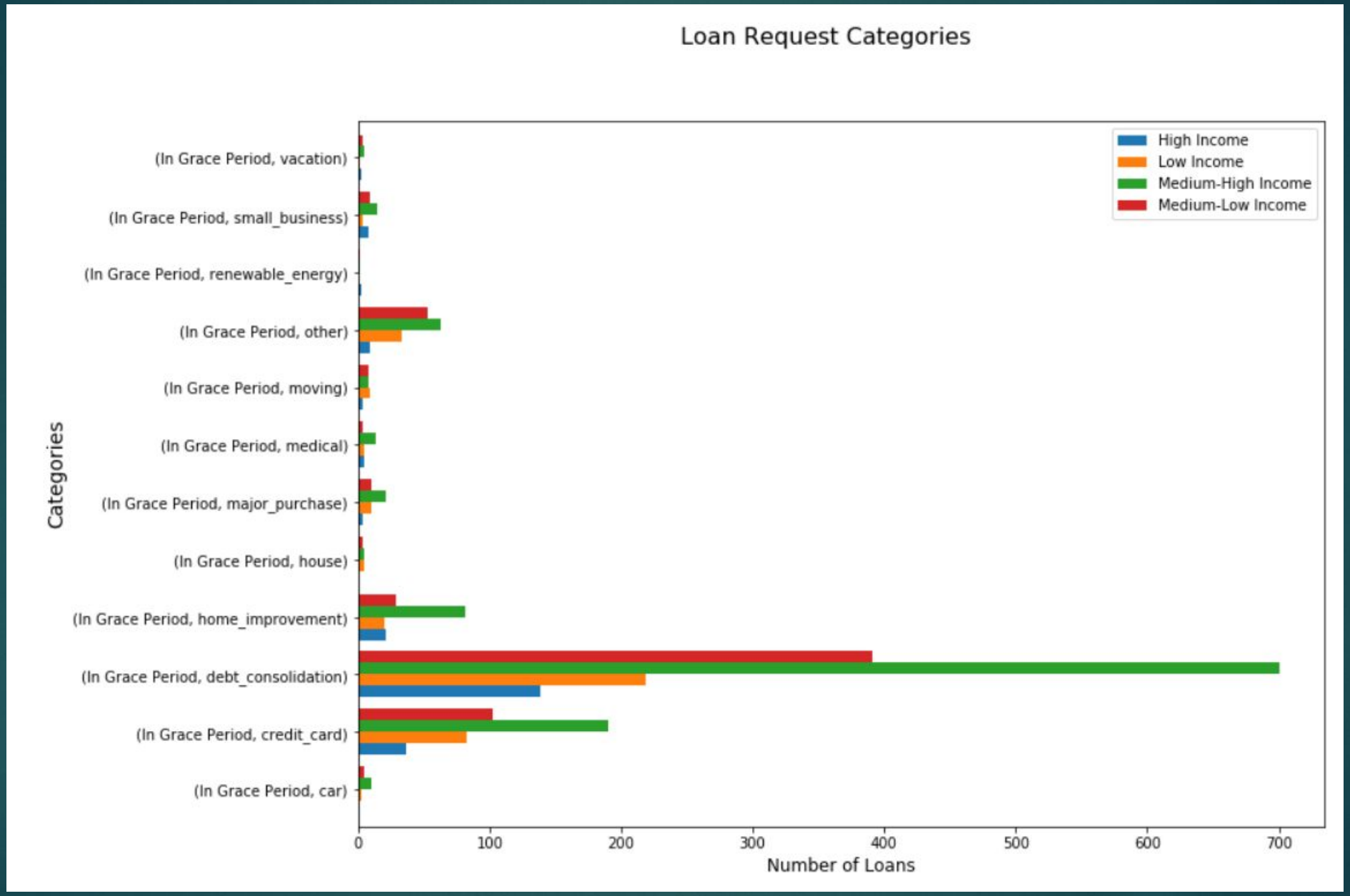
Default and in grace period loans have the highest credit utilization while fully paid and current loans have the lowest which validates my literature review. Good status loans are associated with lower revolving utilization and vice versa.

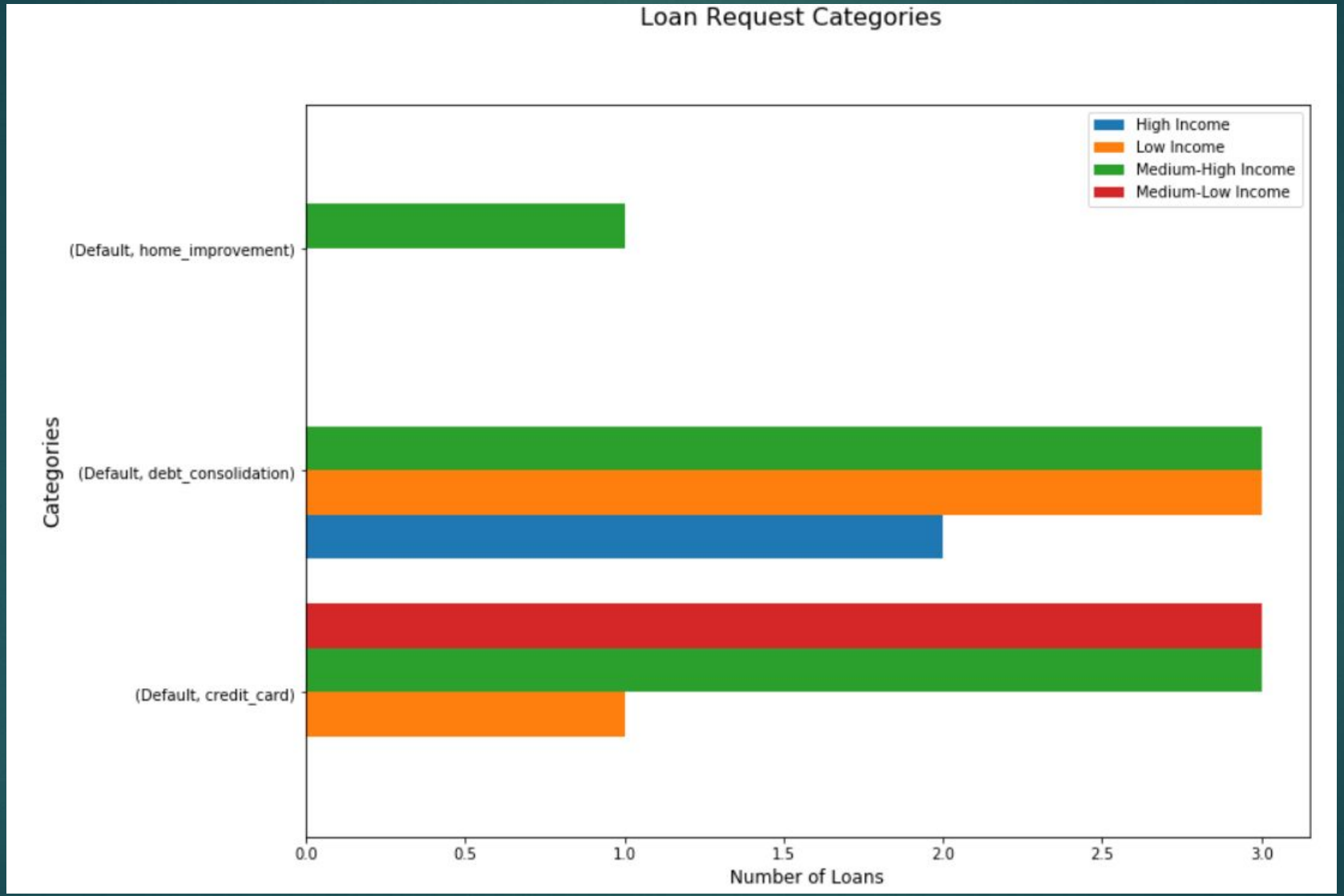

Loan Request Categories
High Income
Low Income
Medium-High Income
Medium-Low Income
(Fully Paid, wedding)
(Fully Paid, vacation)
(Fully Paid, small_business)
(Fully Paid, renewable_energy)
(Fully Paid, other)
(Fully Paid, moving)
(Fully Paid, medical)
(Fully Paid, major_purchase)
(Fully Paid, house)
(Fully Paid, home_improvement)
(Fully Paid, debt_consolidation)
(Fully Paid, credit_card)
(Fully Paid, car)
Categories
0
2500
5000
7500
10000
12500
15000
17500
20000
Number of Loans


Loan Request Categories
High Income
Low Income
Medium-High Income
Medium-Low Income
(Current, vacation)
(Current, small_business)
(Current, renewable_energy)
(Current, other)
(Current, moving)
(Current, medical)
(Current, major_purchase)
(Current, house)
(Current, home_improvement)
(Current, educational)
(Current, debt_consolidation)
(Current, credit_card)
(Current, car)
Categories
0
5000
10000
15000
20000
25000
30000
35000
Number of Loans

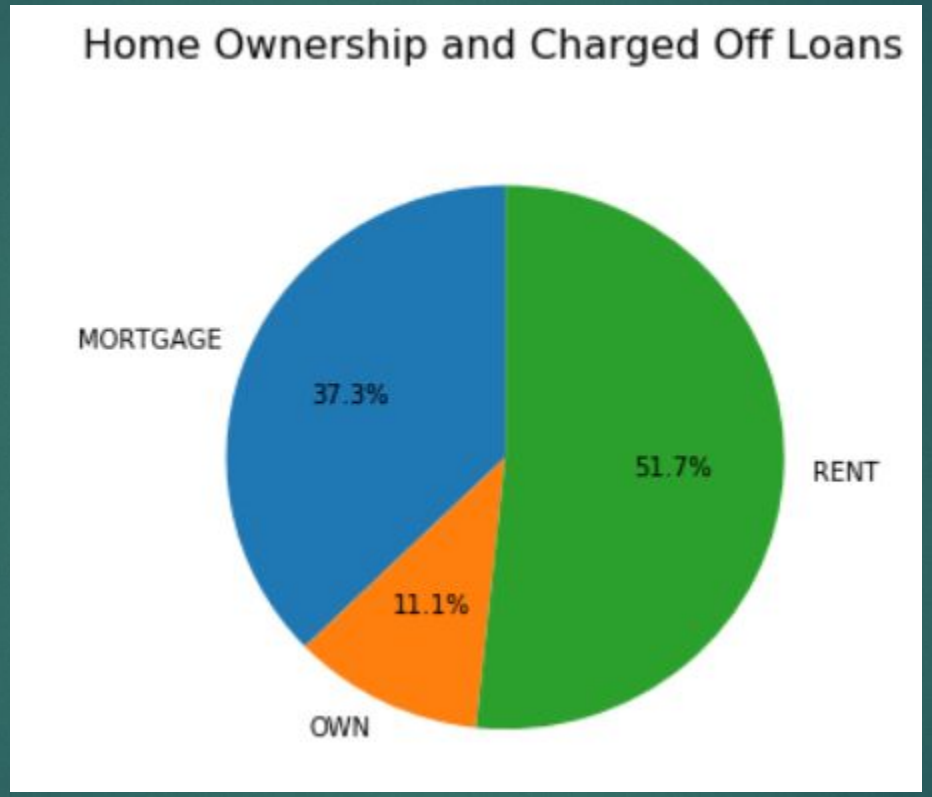

Loan Request Categories
High Income
Low Income
Medium-High Income
Medium-Low Income
(Charged Off, vacation)
(Charged Off, small_business)
(Charged Off, renewable_energy)
(Charged Off, other)
(Charged Off, moving)
(Charged Off, medical)
(Charged Off, major_purchase)
(Charged Off, house)
(Charged Off, home_improvement)
(Charged Off, debt_consolidation)
(Charged Off, credit_card)
(Charged Off, car)
Categories
0
1000
2000
3000
4000
5000
6000
Number of Loans

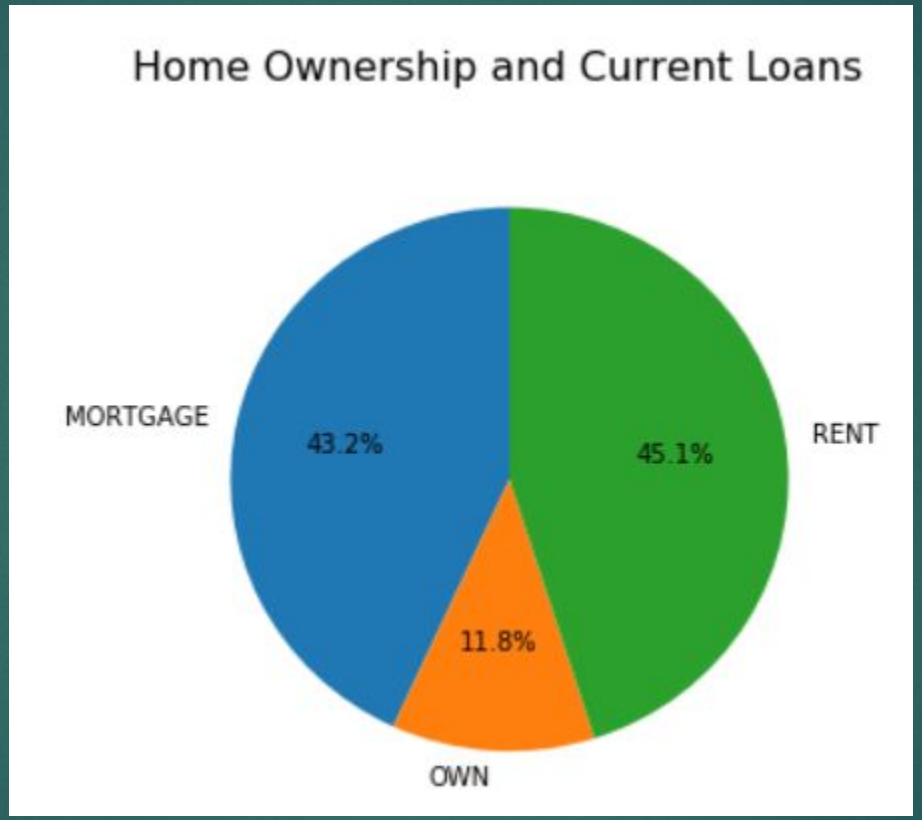

Loan Request Categories
High Income
Low Income
Medium-High Income
Medium-Low Income
(Late, vacation)
(Late, small_business)
(Late, renewable_energy)
(Late, other)
(Late, moving)
(Late, medical)
(Late, major_purchase)
(Late, house)
(Late, home_improvement)
(Late, debt_consolidation)
(Late, credit_card)
(Late, car)
Categories
0
200
400
600
800
1000
1200
1400
1600
Number of Loans

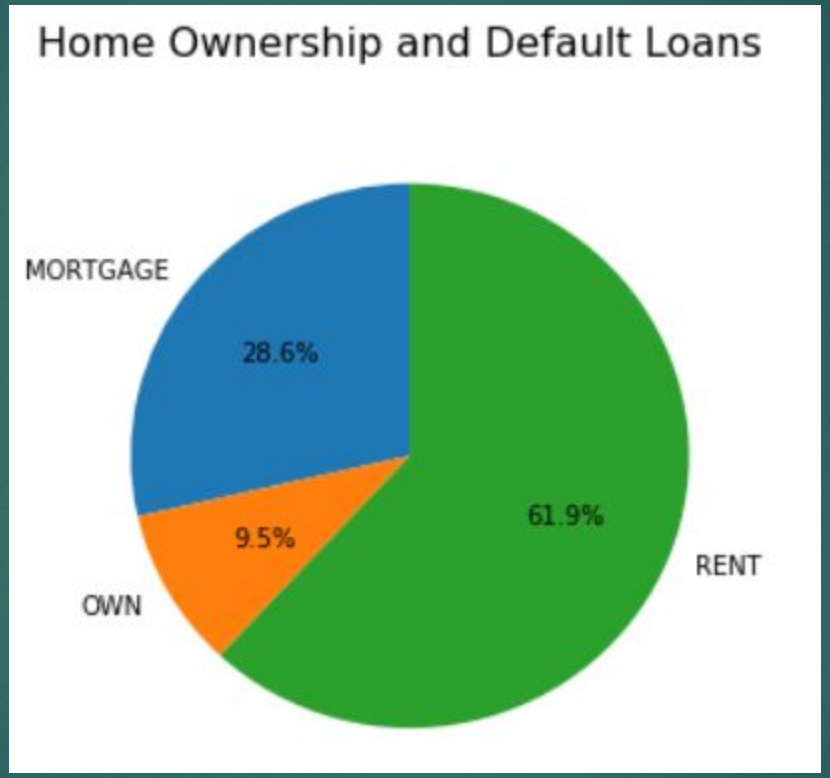

Loan Request Categories
High Income
Low Income
Medium-High Income
Medium-Low Income
(In Grace Period, vacation)
(In Grace Period, small_business)
(In Grace Period, renewable_energy)
(In Grace Period, other)
(In Grace Period, moving)
(In Grace Period, medical)
(In Grace Period, major_purchase)
(In Grace Period, house)
(In Grace Period, home_improvement)
(In Grace Period, debt_consolidation)
(In Grace Period, credit_card)
(In Grace Period, car)
Categories
0
100
200
300
400
500
600
700
Number of Loans

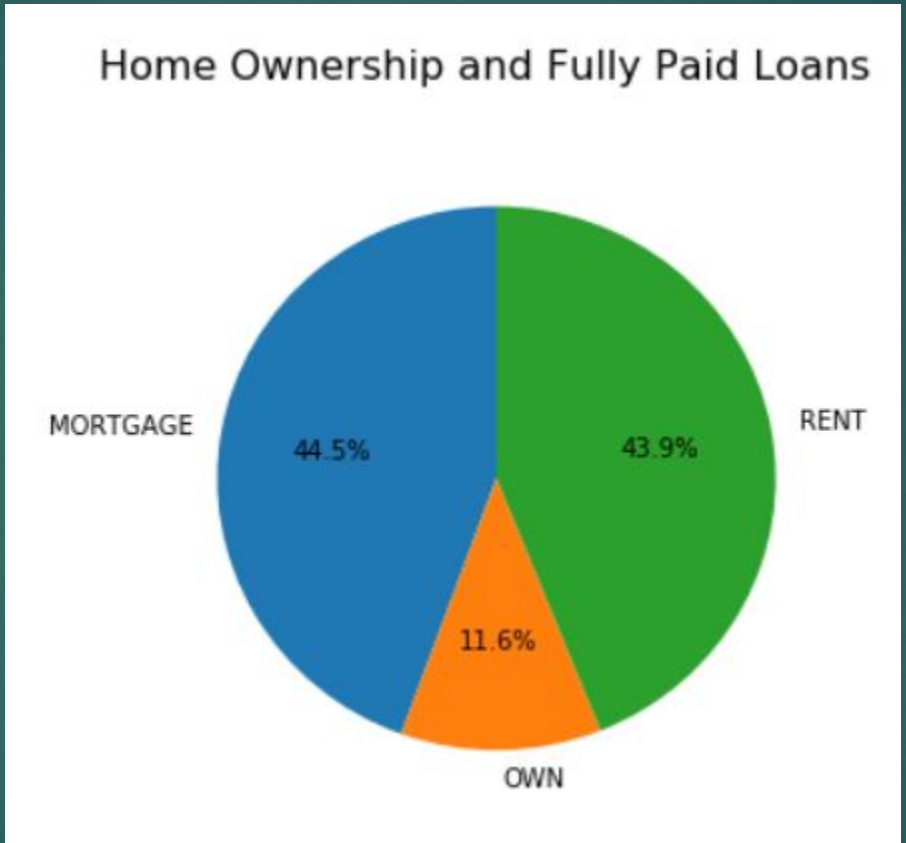

Loan Request Categories
High Income
Low Income
Medium-High Income
Medium-Low Income
(Default, home_improvement)
(Default, debt_consolidation)
(Default, credit_card)
Categories
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Number of Loans

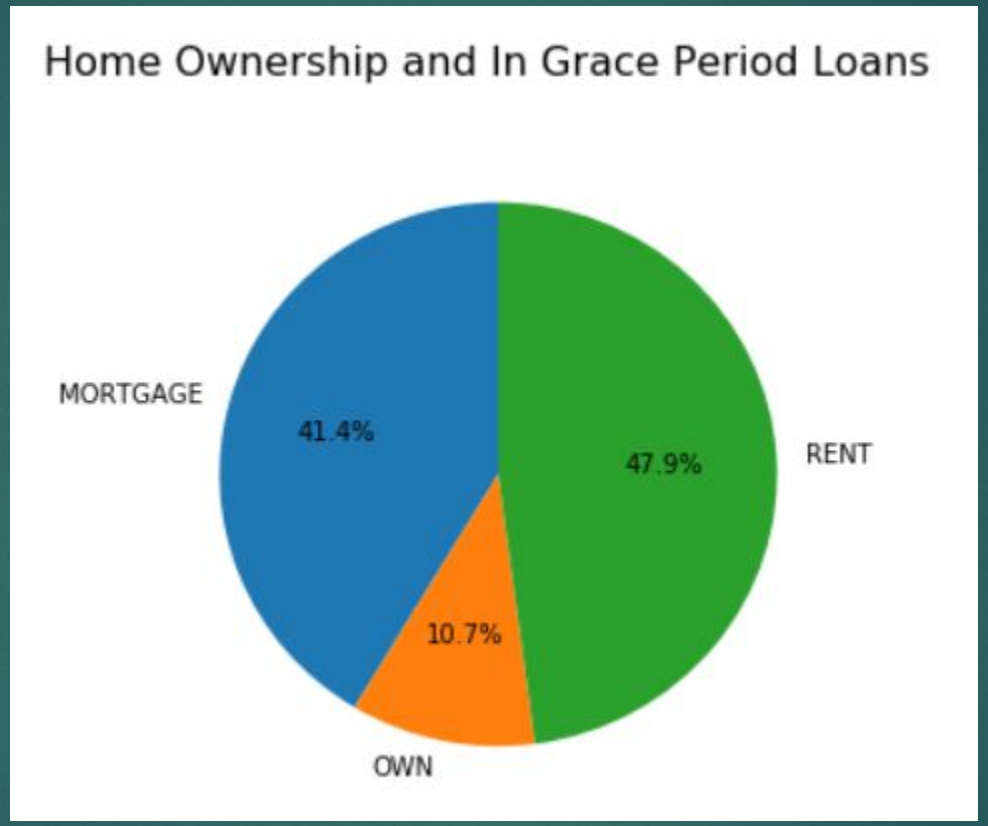
- The loan request categories reveal no significant differences for each loan variant. In fact, the most significant purpose for a loan is attributed to debt consolidation followed by credit card and home improvement.

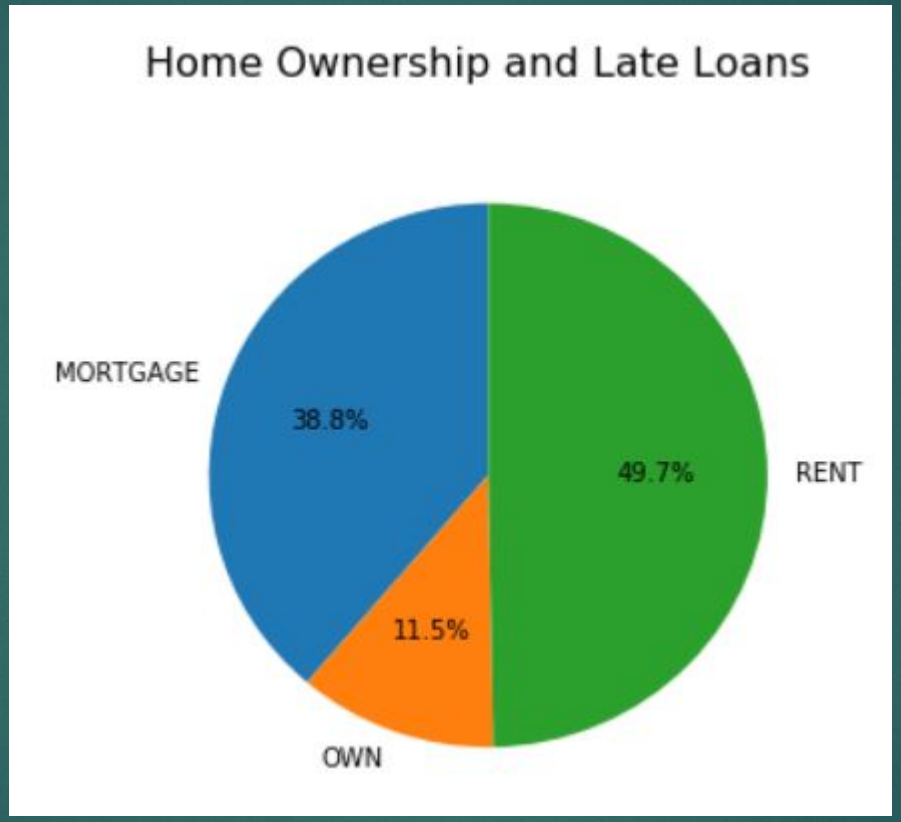

Home Ownership and Charged Off Loans
MORTGAGE
37.3%
51.7%
RENT
11.1%
OWN


Home Ownership and Current Loans
MORTGAGE
43.2%
RENT
45.1%
11.8%
OWN


Home Ownership and Default Loans
MORTGAGE
28.6%
9.5%
OWN
61.9%
RENT

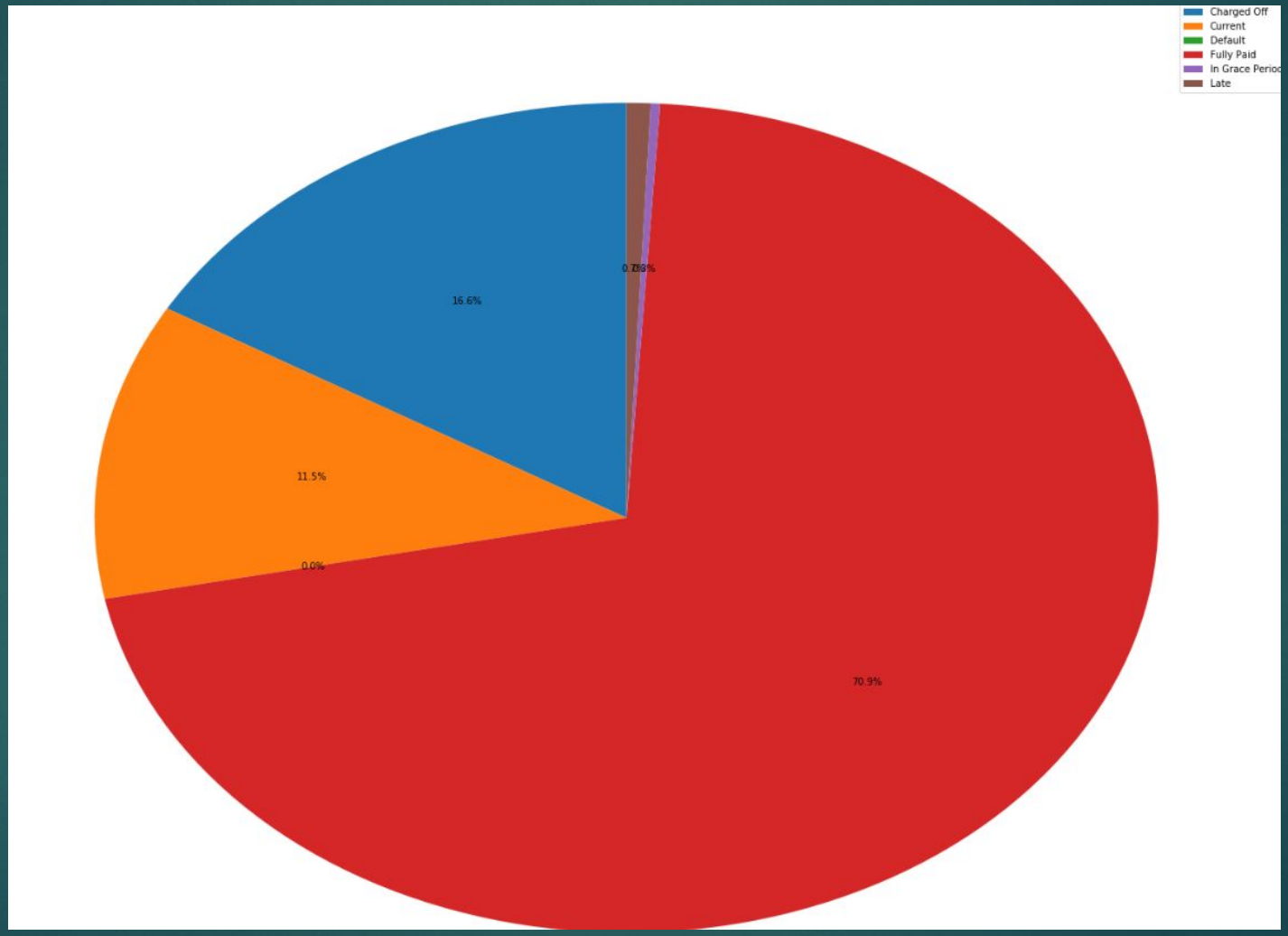

Home Ownership and Fully Paid Loans
MORTGAGE
RENT
OWN
44.5%
43.9%
11.6%


Home Ownership and In Grace Period Loans
MORTGAGE
41.4%
47.9%
RENT
10.7%
OWN

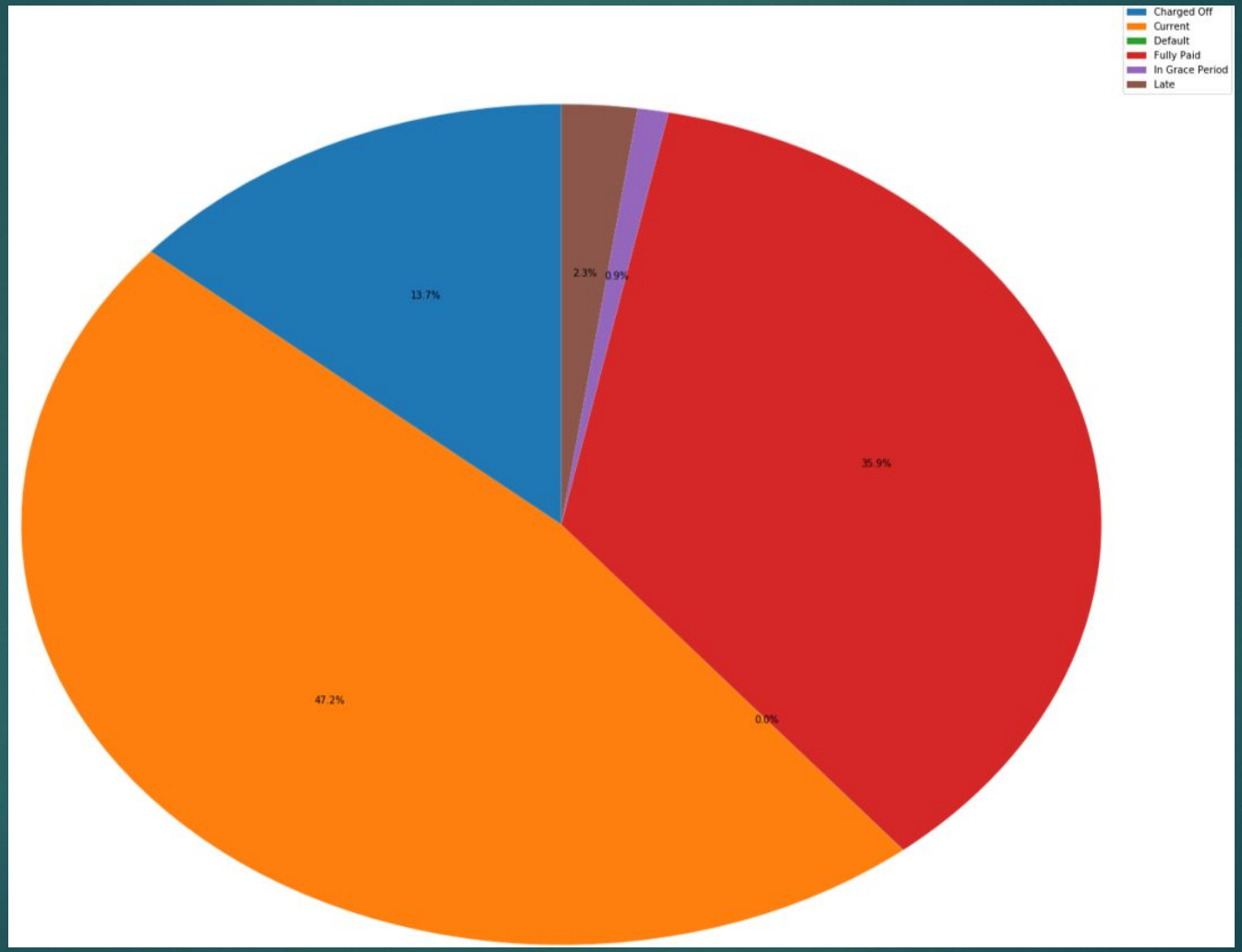

Home Ownership and Late Loans
MORTGAGE
38.8%
49.7%
RENT
11.5%
OWN

- Charged off, In grace period, late, and default loans are more associated with rent than mortgage while the other loan variants were more associated with mortgage.

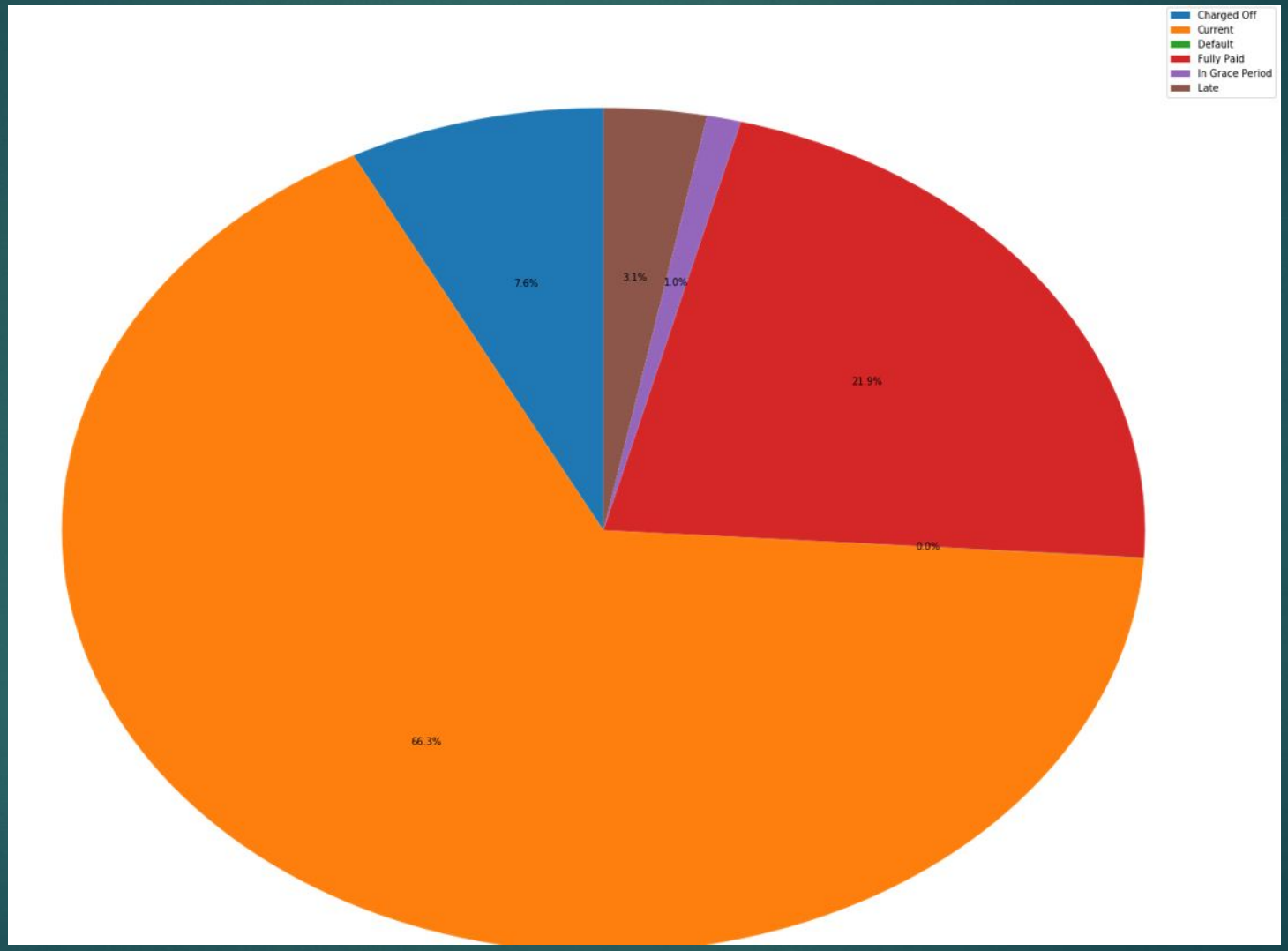
Distribution of Loans in 2014



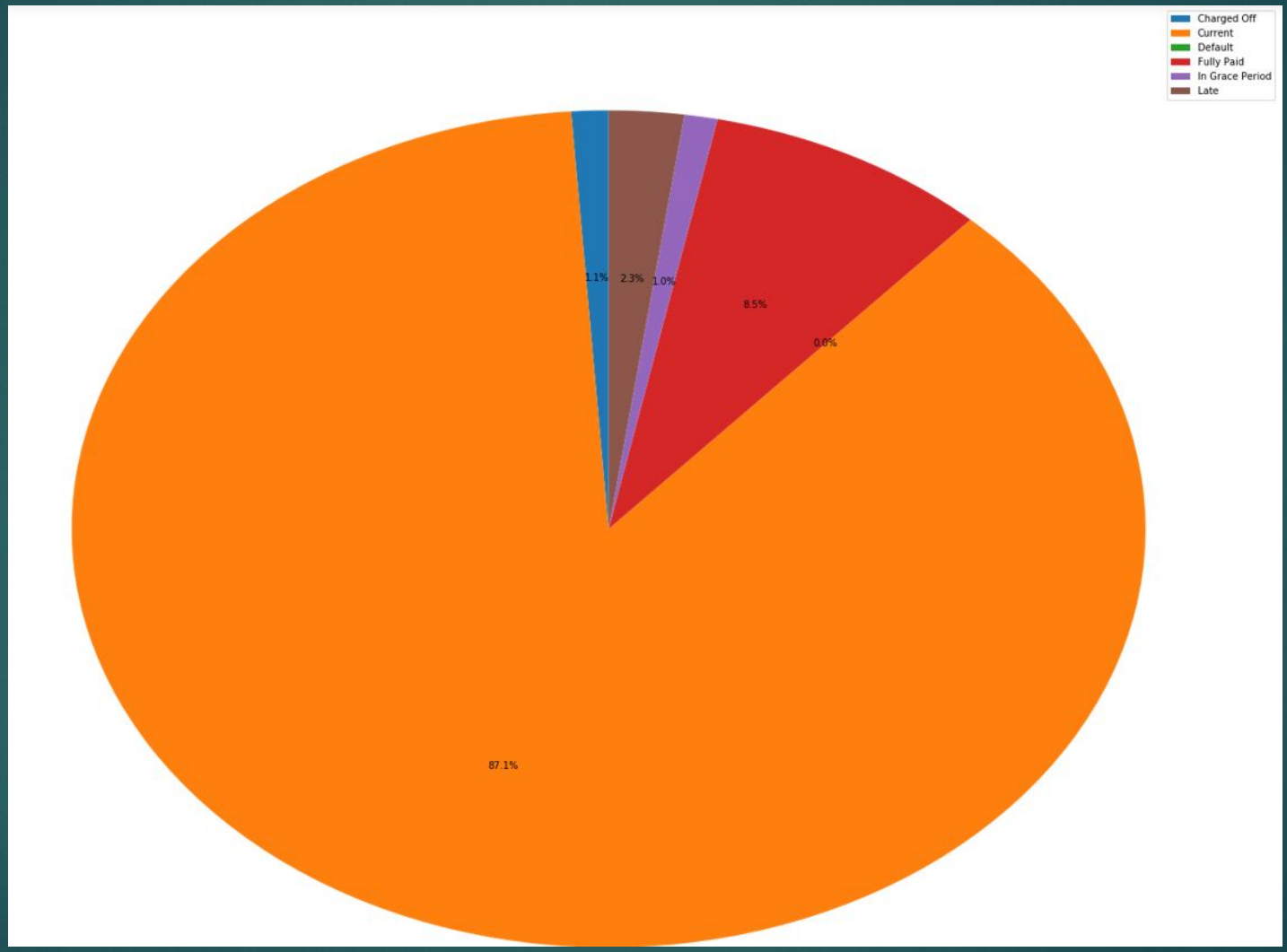
Distribution of Loans in 2015



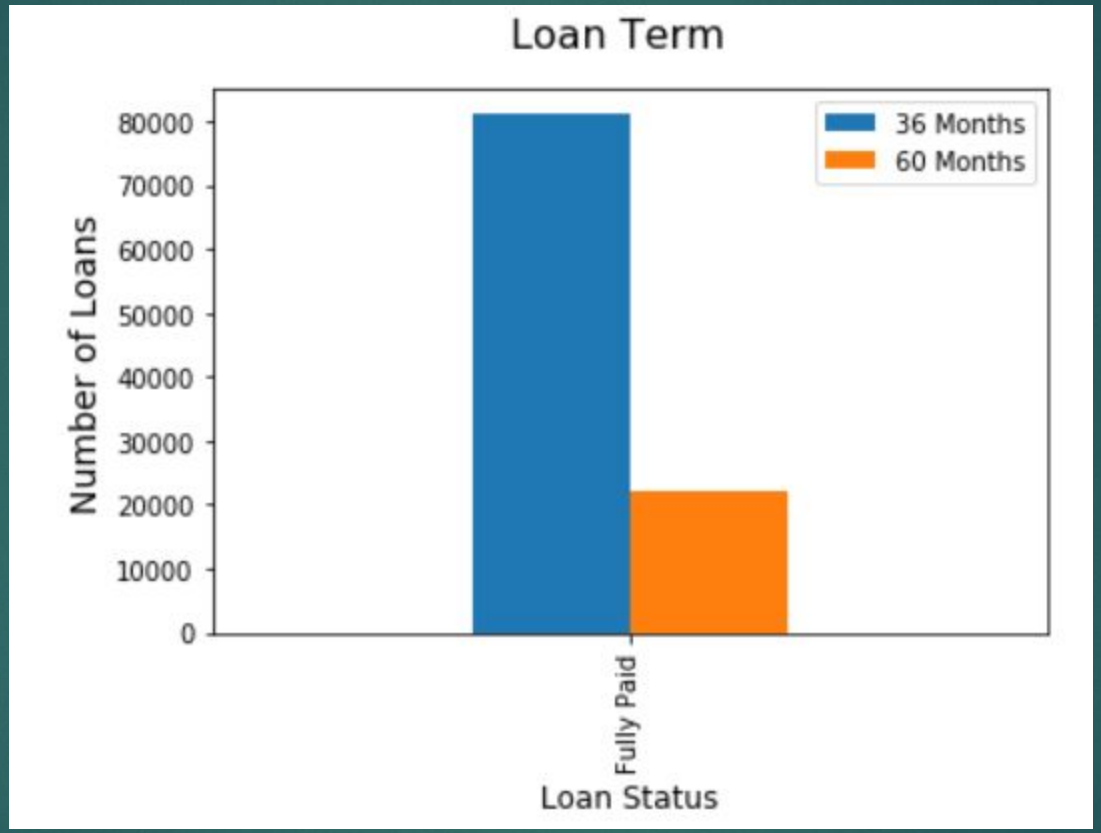
Distribution of Loans in 2016

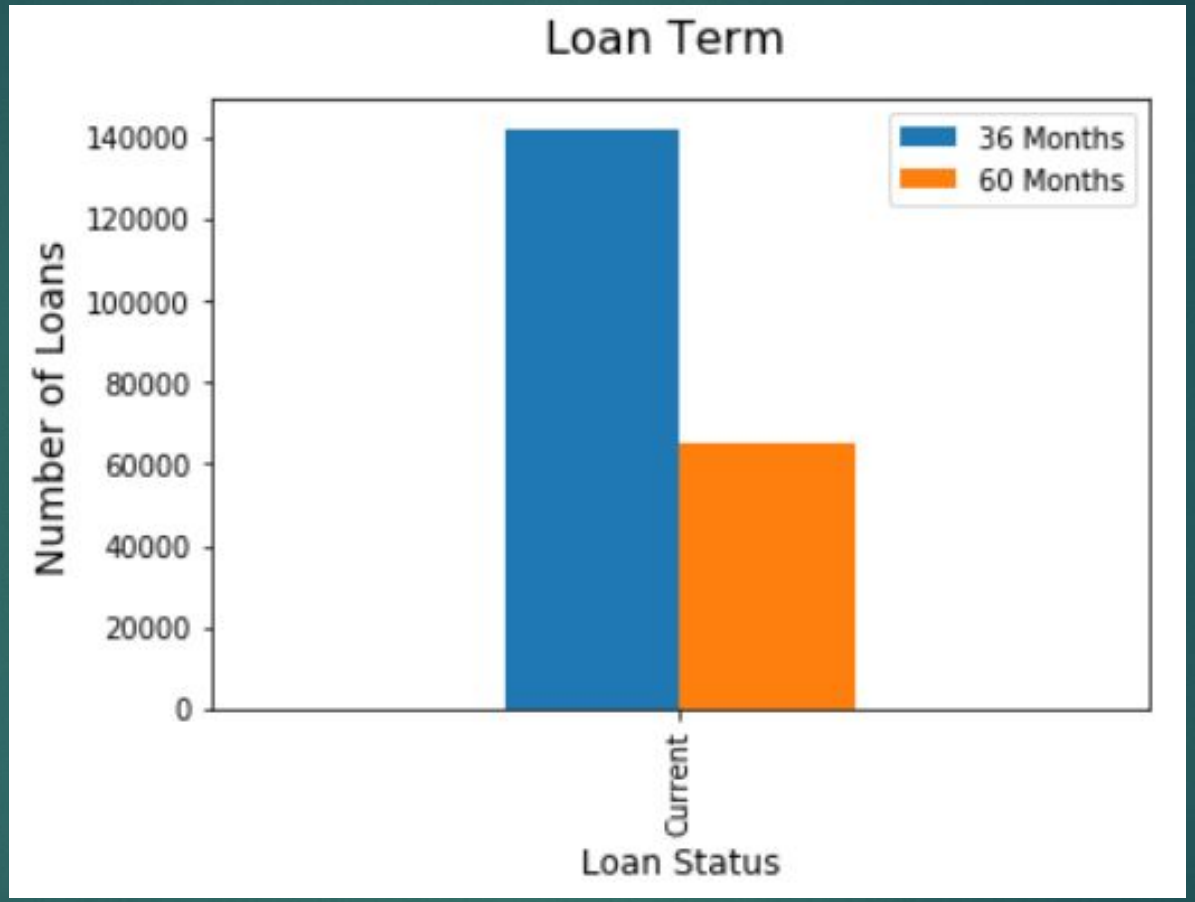


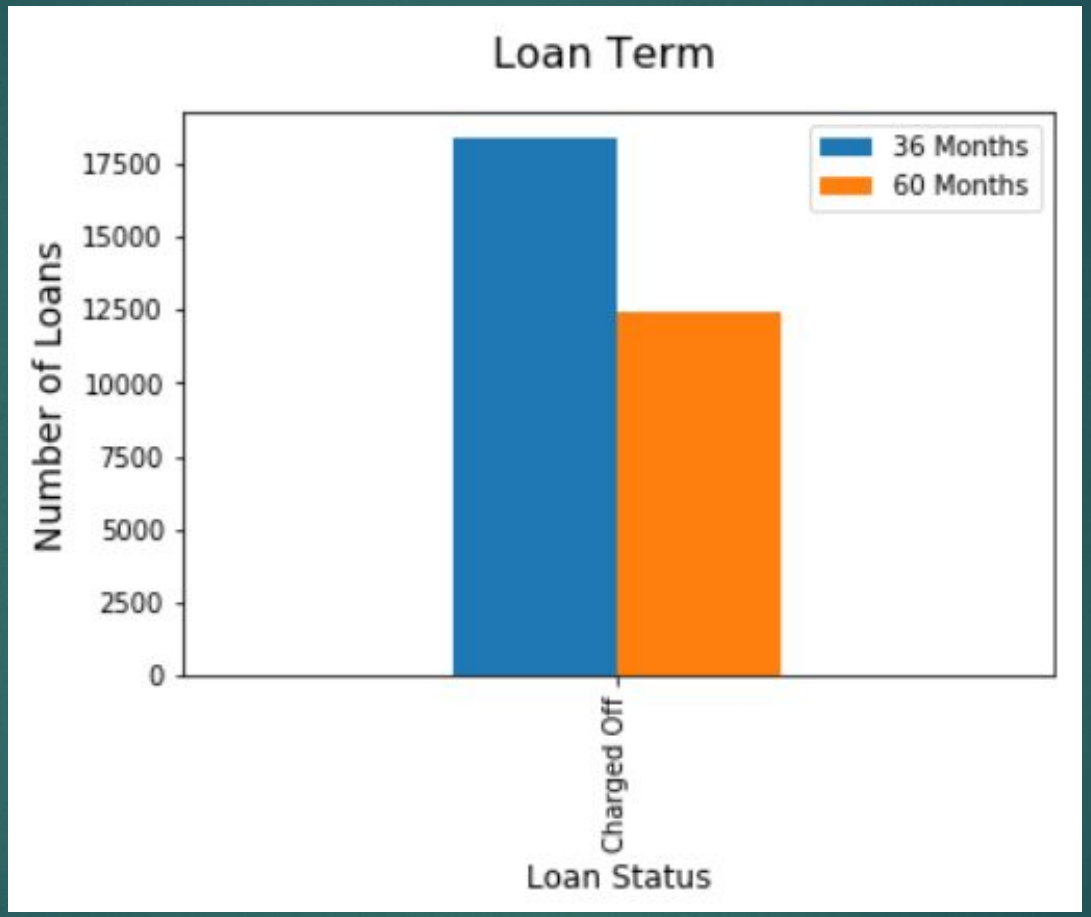
Distribution of Loans in 2017

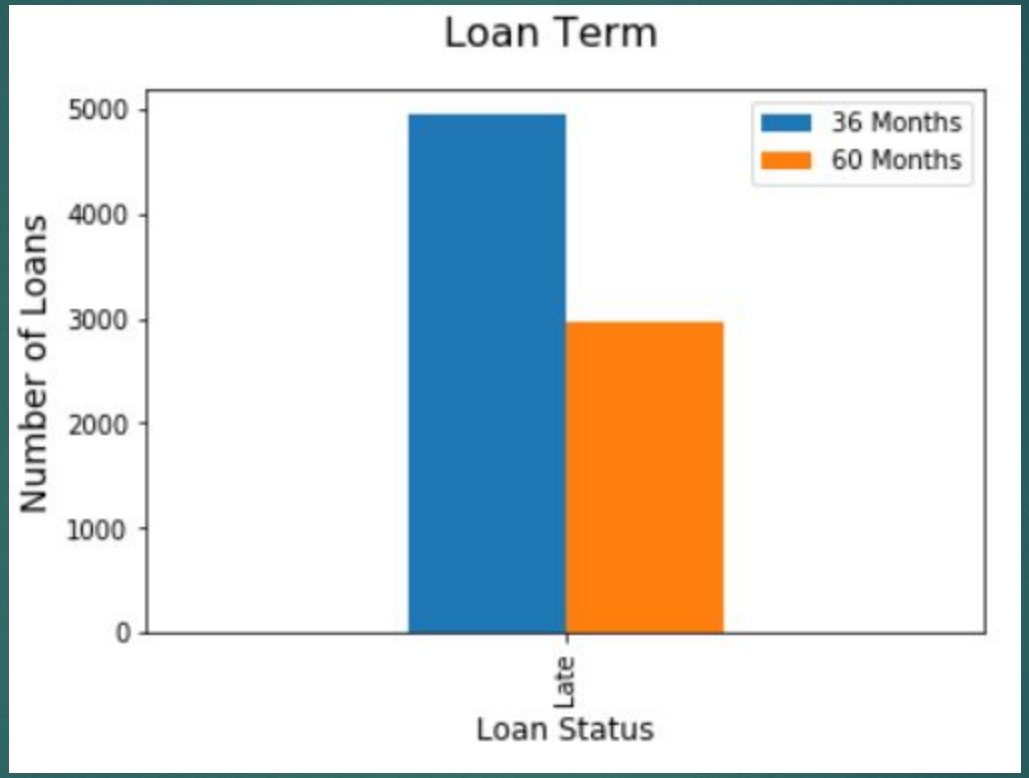


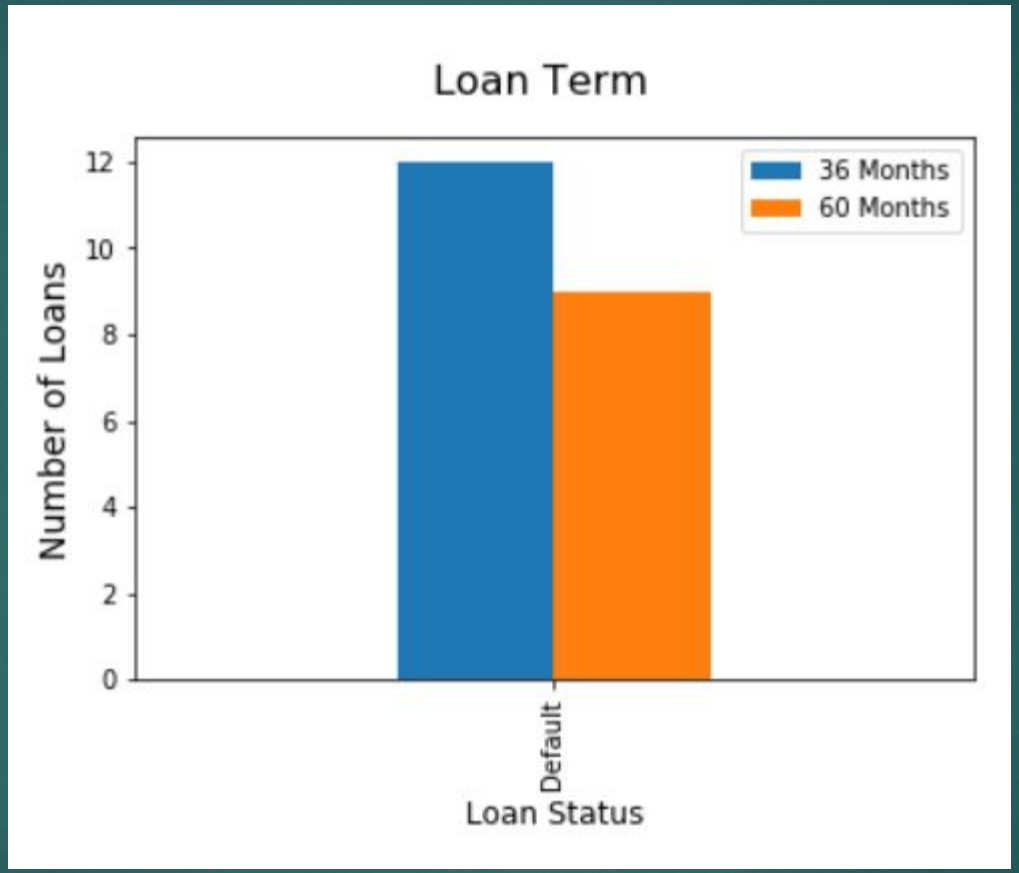
- Initially, fully paid loans followed by charged off and current loans were the largest portions at 70.9%, 16.6%, and 11.5%, respectively.
- However, the fully paid and charged off percentages decreased dramatically as the current loan percentage significantly increased.
- In 2017, current loans made up 47.2% followed by fully paid loans at 35.9%. Default loans made up the smallest percentage (near 0%) followed by in grace period loans (near 1%). Therefore, this trend may continue in the future.

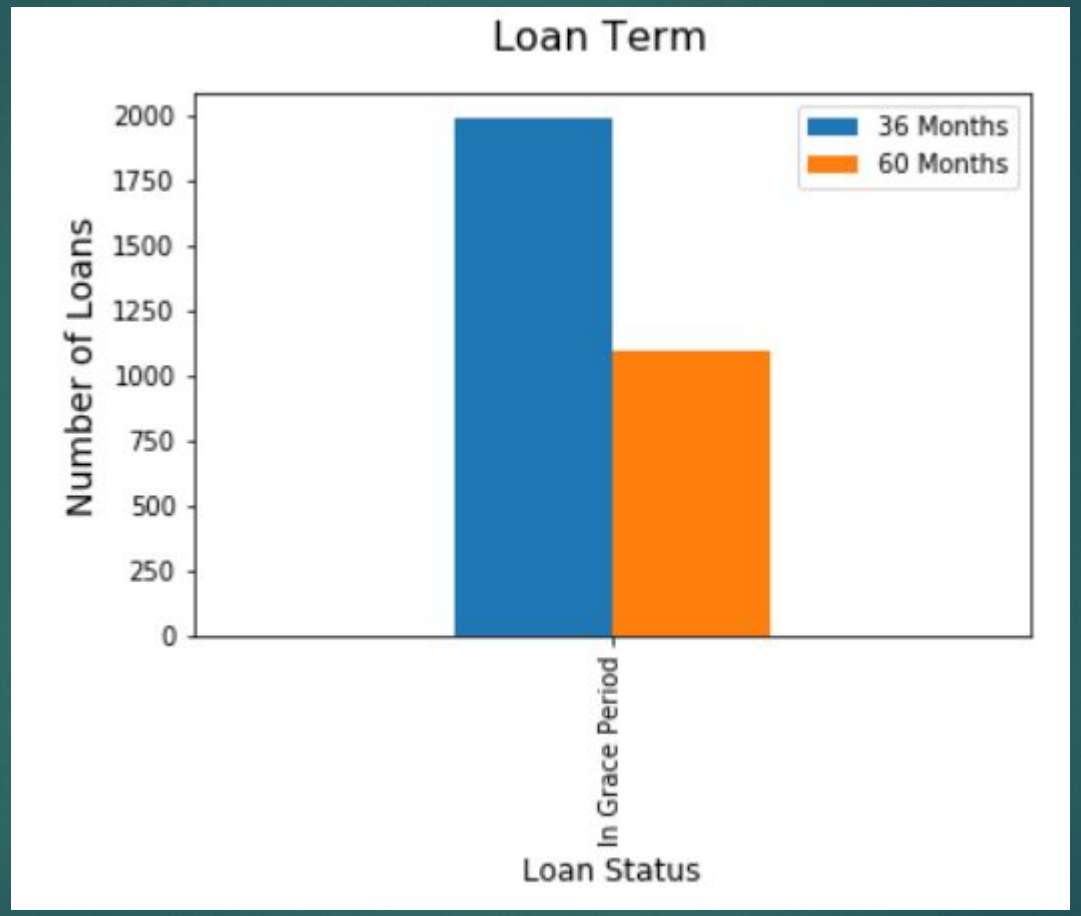

Loan Term
36 Months
60 Months
Number of Loans
80000
70000
60000
50000
40000
30000
20000
10000
0
Fully Paid
Loan Status


Loan Term
36 Months
60 Months
140000
120000
100000
80000
60000
40000
20000
0
Number of Loans
Current
Loan Status

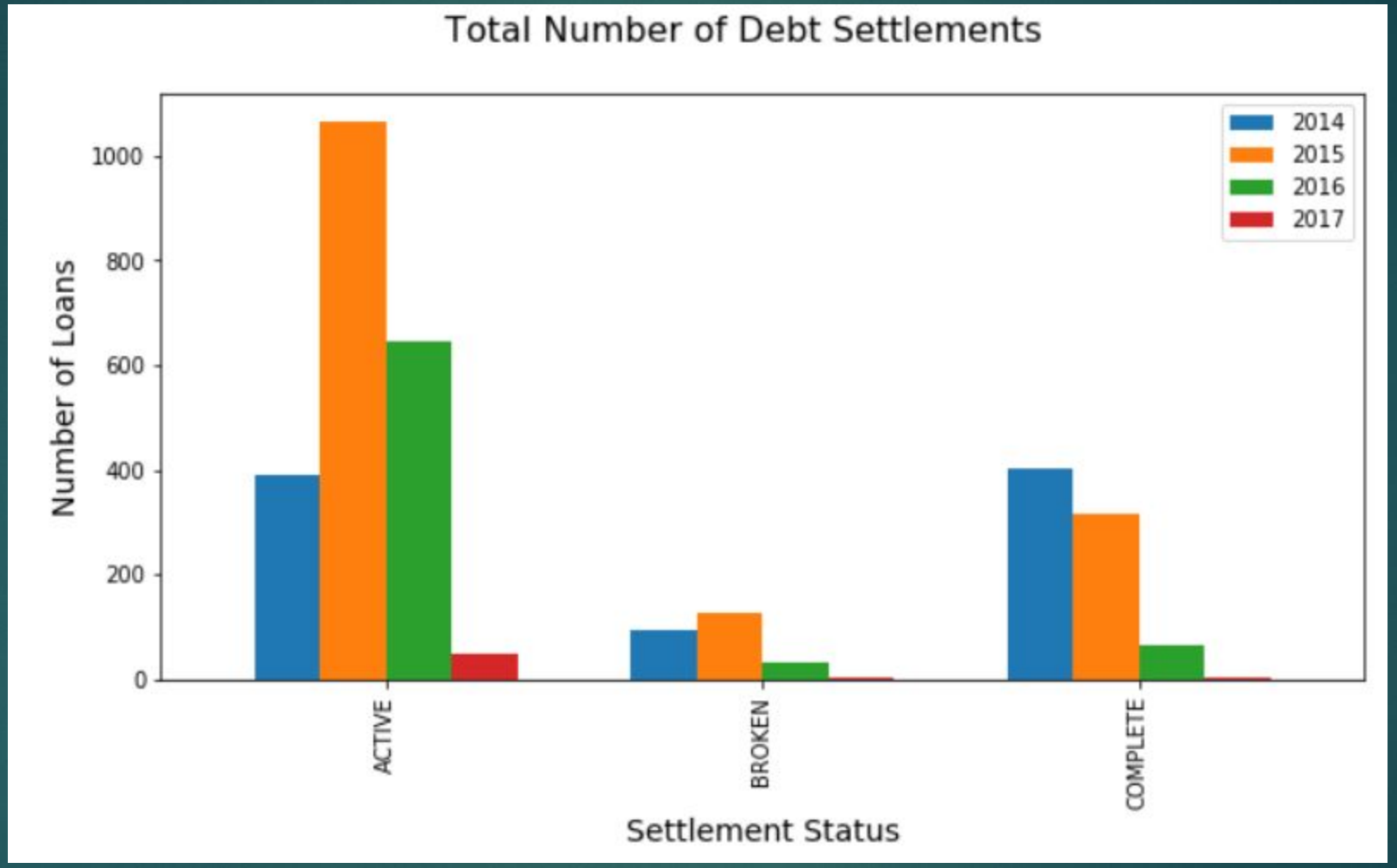

Loan Term
36 Months
60 Months
17500
15000
12500
10000
7500
5000
2500
0
Number of Loans
Charged Off
Loan Status


Loan Term
5000
4000
3000
2000
1000
0
Number of Loans
36 Months
60 Months
Late
Loan Status

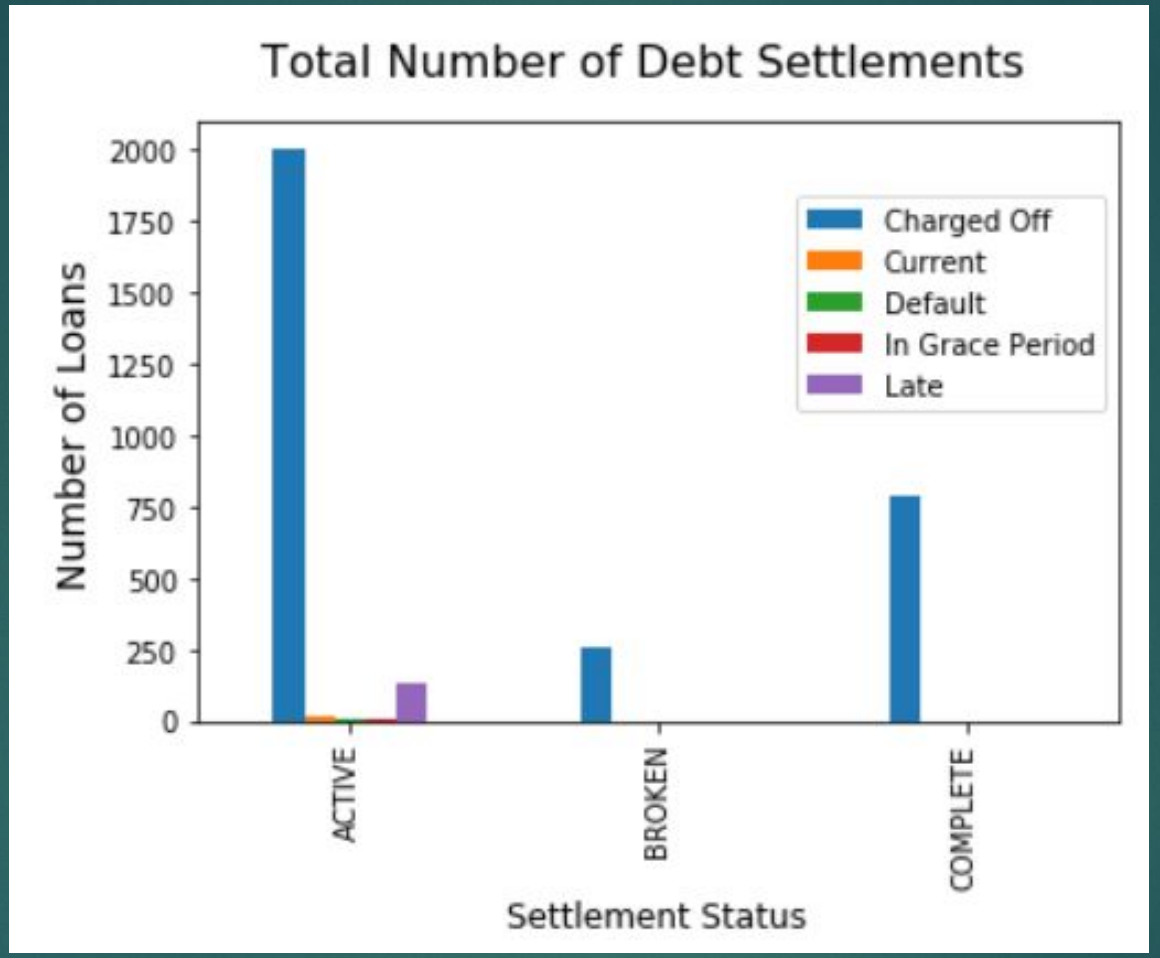

Loan Term
36 Months
60 Months
Number of Loans
12
10
8
6
4
2
0
Default
Loan Status


Loan Term
Number of Loans
2000
1750
1500
1250
1000
750
500
250
0
36 Months
60 Months
In Grace Period
Loan Status

- Fully paid and current loans tend to be associated with shorter loan term (36 months) unlike the other loan variants (especially default loans)



The overall number of settlement plans have decreased dramatically. Most of the debt settlements were active followed by complete.



most active settlements were charged off (2000 loans), followed by late (134 loans), and current (11 loans). Default and in grace period tied last with only 2 loans. Charged off loans made up all of the broken and complete settlements.

Conclusion

- Fully paid and current loans are associated with higher LC grades, lower dtis, higher FICO scores, and lower credit utilization compared to the other loans.
- The number of current loans has dramatically increased while fully paid and charged off loan decreased.
- Although the overall number of settlement plans have decreased dramatically in the four-year period, the highest debt settlements are active.

Learning Processes

- I have learned how to import and clean raw data.
- I have learned a great deal using matplotlib, pandas, particularly pandas data frame. I have manipulated the data to plot pie charts, bar charts, line graphs, and choropleth maps.
- I have also learned about peer-to-peer lending and the loan status variants of the Northeastern states.