

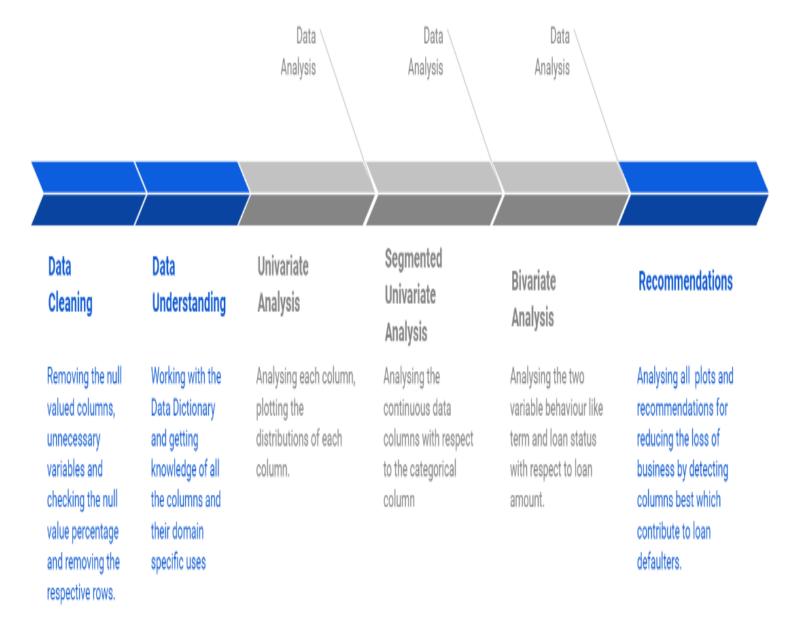
Problem Statement

A consumer finance company specializes in lending various types of loans to urban customers. When the company receives a loan application, it must decide 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 aim is to identify patterns which indicate if a person is likely to default, which may be used for taking actions such as denying the loan, reducing the amount of loan, lending (to risky applicants) at a higher interest rate, etc.

Problem Solving Methodology



Data Cleaning & Understanding

Removal of Null Values columns

Removal of columns with only 1-2 unique values

Obtaining Derived Variables

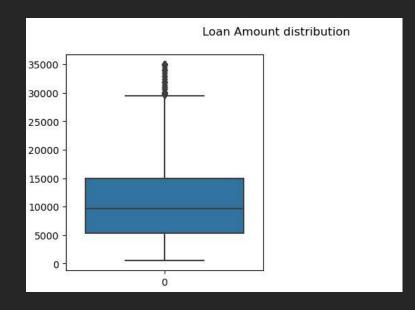
Data Type conversion

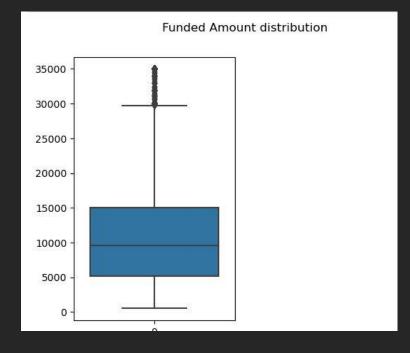
Identifying important columns for analysis and taking them into consideration.

Univariate Analysis

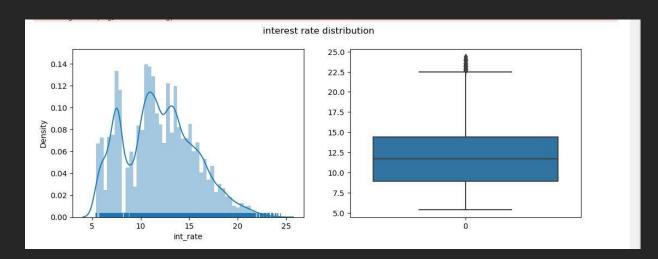
Observations:

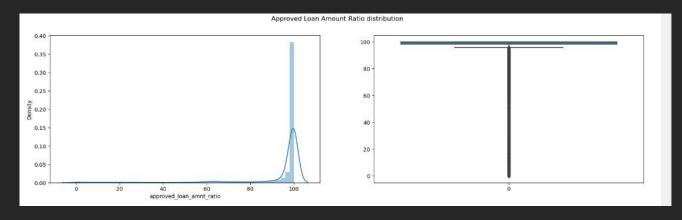
- More number of people took loan amount of 10000, and a very few people took more than 30000 loan amount.
- Lending club approved most of Applied loan amount.

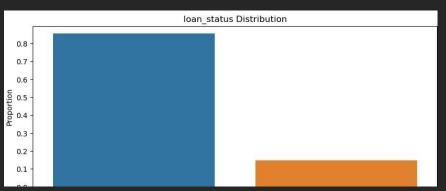




- ■70% of Borrowers got 100% loan amount from investors.
- •Most of the interest rates lies between 9% to 14.5%. Some people took loan at higher rates of interest i.e., 22.5%
- •85% of borrowers has paid the loan fully. where are 14% are defaulted the loan.



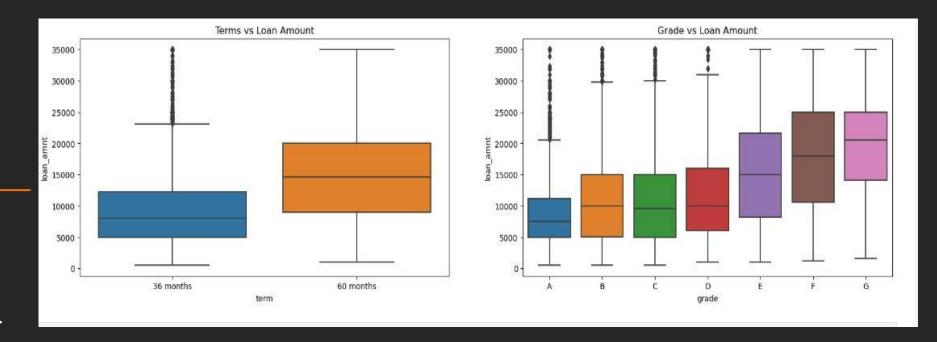


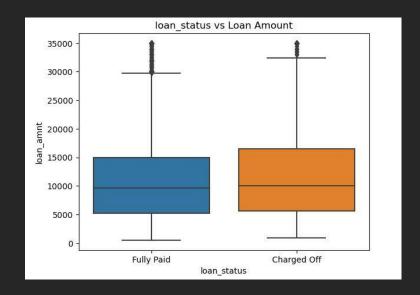


Segmented Univariate Analysis

Observations:

- •Higher amount loans have high tenure i.e., 60 months.
- •Grade 'G' and 'H' have taken max loan amount. As Grades are decreasing the loan amount is increasing.
- Charged Off loans have higher amounts than Fully Paid ones.

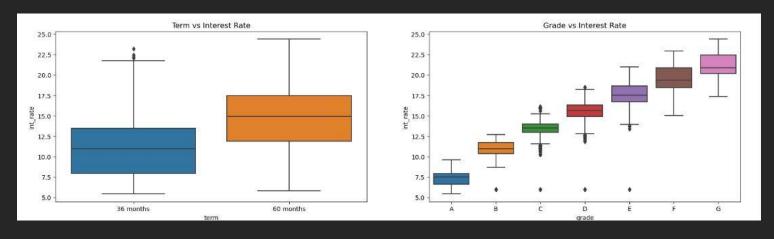


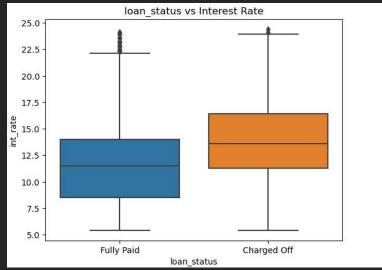


The interest rates are higher for Higher tenure loans.

Interest Rates are Higher as Grades are Lowering (A to G).

Greater the interest rate more the chance of Defaulting the loan.

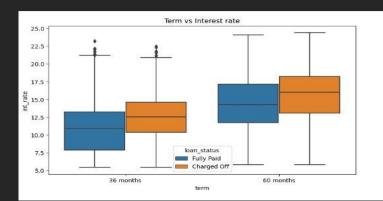


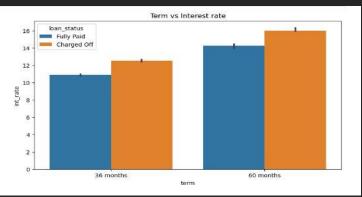


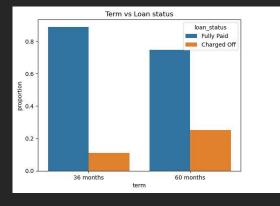
Bivariate Analysis

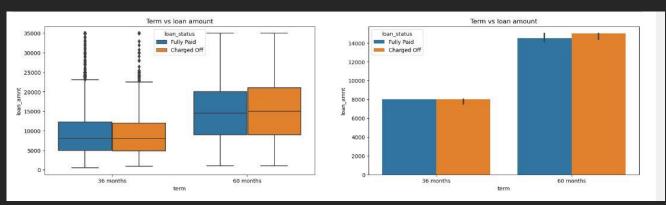
Observations:

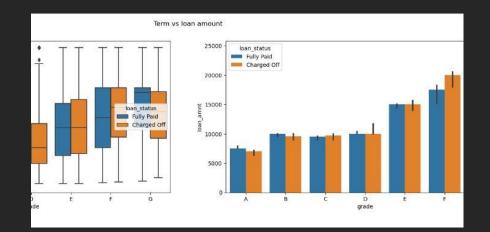
- Proportion of borrowers defaulted loan in 60 months term is more than in 36 months.
- •Fully Paid rate is higher in 36 months tenure.
- Loan amount is not a decider for defaults in both 36 and 60 months.
- Borrowers have equal distribution is both default and non default for 36and 60-months tenures.
- For higher interest rates the default rate is higher in both 36- and 60-months tenure.



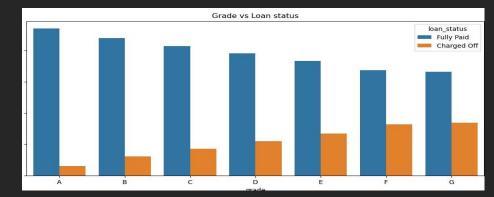


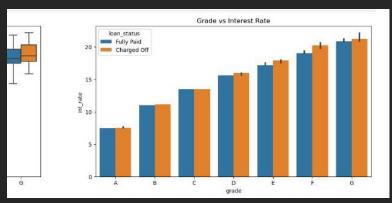






- Charged off increases as grades decreases.
- •For lower grades 'F' and 'G' there are more difference between charged-off and fully paid.
- The lower grade people has taken higher amount of loans and also, they are more prone to default the loan.
- As grade decreases the interest rate gradually increases. and they are more and more prone to default the loan.





Observations:

- The public derogatory records column is highly (+ve) correlated with public bankruptcies records.
- Interest rates are high for people with high revol utilization.

id -	1	0.12	0.13	0.23	0.054	0.076	0.0056	0.092	-0.0084	-0.041	0.016	-0.018	0.0014	0.091	0.04	0.11	0.19	0.14	-0.008	0.41
loan_amnt -	0.12		0.98	0.94	0.3	0.93	0.27	0.062	-0.032	0.013	0.18	-0.05	0.31	0.063	0.26	0.88	0.85		-0.036	-0.11
funded_amnt -	0.13	0.98		0.96	0.3	0.96	0.26	0.062	-0.032	0.013	0.18	-0.051	0.31	0.067	0.25	0.9	0.86		-0.037	-0.038
funded_amnt_inv -	0.23	0.94	0.96		0.3	0.91	0.25	0.071	-0.038	-0.0028	0.16	-0.051	0.29	0.072	0.24	0.87	0.91		-0.041	0.19
int_rate -	0.054	0.3	0.3	0.3	1	0.28	0.049	0.11	0.16	0.13	0.006	0.099	0.094		-0.047	0.29	0.28	0.17	0.083	0.02
installment -	0.076	0.93	0.96	0.91	0.28	1	0.27	0.052	-0.02	0.011	0.17	-0.046	0.31	0.093	0.23	0.86	0.82	0.41	-0.033	-0.05
annual_inc -	0.0056	0.27	0.26	0.25	0.049	0.27	1	-0.12	0.022	0.035	0.16	-0.018	0.28	0.017	0.23	0.26	0.25	0.14	-0.016	-0.031
dti -	0.092	0.062	0.062	0.071	0.11	0.052	-0.12	1	-0.033	0.0022	0.29	-0.0047	0.23	0.28	0.23	0.059	0.066	0.0086	0.006	0.033
delinq_2yrs -	-0.0084	-0.032	-0.032	-0.038	0.16	-0.02	0.022	-0.033	1	0.0087	0.012	0.0076	-0.054	-0.043	0.067	-0.023	-0.03	-0.013	0.0034	-0.016
inq_last_6mths -	-0.041	0.013	0.013	-0.0028	0.13	0.011	0.035	0.0022	0.0087	1	0.093	0.024	-0.021	-0.07	0.11	-0.0082	-0.019	0.028	0.016	-0.046
open_acc -	0.016	0.18	0.18	0.16	0.006	0.17	0.16	0.29	0.012	0.093	1	2.8e-05	0.29	-0.09	0.69	0.16	0.15	0.082	0.0058	-0.038
pub_rec -	-0.018	-0.05	-0.051	-0.051	0.099	-0.046	-0.018	-0.0047	0.0076	0.024	2.8e-05	1	-0.061	0.059	-0.023	-0.053	-0.053	-0.033	0.85	-0.0062
revol_bal -	0.0014	0.31	0.31	0.29	0.094	0.31	0.28	0.23	-0.054	-0.021	0.29	-0.061	1	0.3	0.31	0.29	0.27	0.13	-0.049	-0.067
revol_util -	0.091	0.063	0.067	0.072		0.093	0.017	0.28	-0.043	-0.07	-0.09	0.059	0.3		-0.071	0.074	0.078	-0.016	0.06	0.032
total_acc -	0.04	0.26	0.25	0.24	-0.047	0.23	0.23	0.23	0.067	0.11	0.69	-0.023	0.31	-0.071	1	0.23	0.22	0.17	-0.011	-0.018
total_pymnt -	0.11	0.88	0.9	0.87	0.29	0.86	0.26	0.059	-0.023	-0.0082	0.16	-0.053	0.29	0.074	0.23	1	0.97	0.51	-0.043	-0.002
total_pymnt_inv -	0.19	0.85	0.86	0.91	0.28	0.82	0.25	0.066	-0.03	-0.019	0.15	-0.053	0.27	0.078	0.22	0.97			-0.046	0.18
last_pymnt_amnt -	0.14	0.47	0.48	0.47	0.17	0.41	0.14	0.0086	-0.013	0.028	0.082	-0.033	0.13	-0.016	0.17	0.51	0.5	1	-0.023	0.007
pub_rec_bankruptcies -	-0.008	-0.036	-0.037	-0.041	0.083	-0.033	-0.016	0.006	0.0034	0.016	0.0058	0.85	-0.049	0.06	-0.011	-0.043	-0.046	-0.023	1	-0.017

- 1.0

- 0.8

- 0.4

- 0.2

Conclusion

- •Grades are a good metric for detecting defaulters. Lending club should examine more information from borrowers before issuing loans to low grade(G to A).
- •Fully Paid rate is higher for 36 months tenure so the Lending club should give more loans for that tenure.
- •The lower grade borrowers should be given less loans as they are more likely to default the loan.
- People with more public derogatory records are having more chances of filing for bankruptcy.
 Lending club should make sure that there are no records of derogatory for borrowers.