

LENDING CLUB CASE STUDY

SUBMISSION

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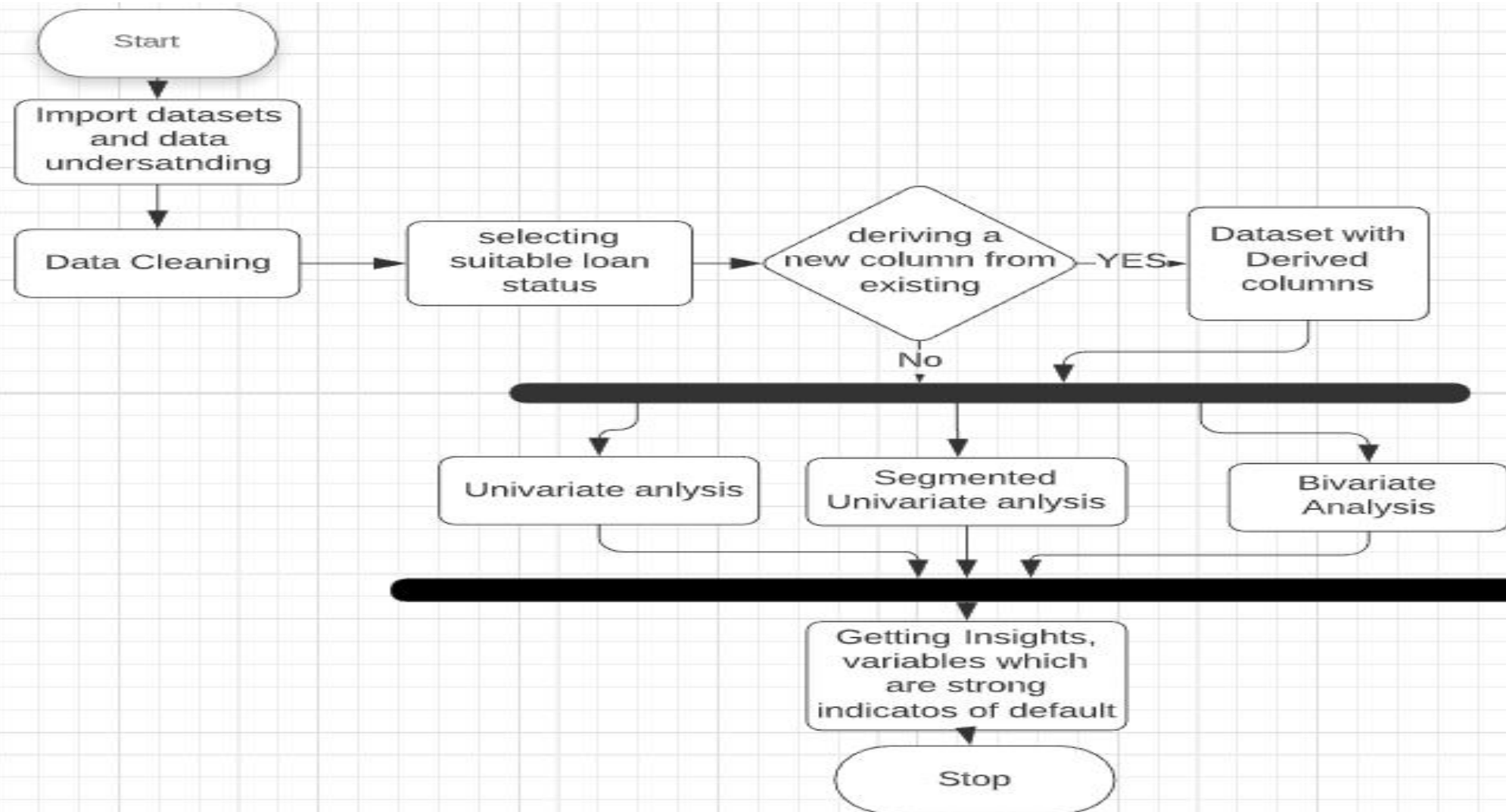
Abstract

The main objective of our analysis is to understand the driving factors behind loan default, i.e. the variables which are strong indicators of default. Like most other lending companies, we are facing a problem whether to **approve/reject** the loan for a particular customer.

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.

Problem solving methodology



Analysis

Step 1 : Derived Metrics

- From issued date we can derive the columns, issued month and issued year.
- From loan amount and annual income we can derive the column loan income ratio.
- Creating bins from the existing data provides a systematic data range and helps us to organize information better and discover patterns easily.
- Creating bins for interest rate , annual income, loan amount for discovering the patterns.

Analysis

Step 2: Univariate analysis

By performing the univariate analysis on the loan dataset, we will get the insights from the variables using this information, we can proceed with the further analysis.

By plotting some of variables and found the following insights:

❖ Quantitative Univariate analysis:

- Most of the loan amount resides in the **range of 5000 to 15000**
- The common interest rates are in the **range of 8.5 to 14.5**
- For most of the customers annual income is in the **range of 40000 to 80000**

Analysis

❖ Qualitative Univariate analysis :

- We can observe that total **chargeOff loan percentage is 14.3.**
- Approx **47% of the applicants applied loan** for paying their other loans(Debt Consolidation).
- 50% of applicants are living in **rented** home whereas 43% applicants were **mortgaged** their home.
- 75% of applicants applied loan for **36 months term period.**
- Number of **loan applicants** are increasing year by year
- Most of the applicants are applying loan in the month of November and December

Analysis

Step 3: Bivariate analysis

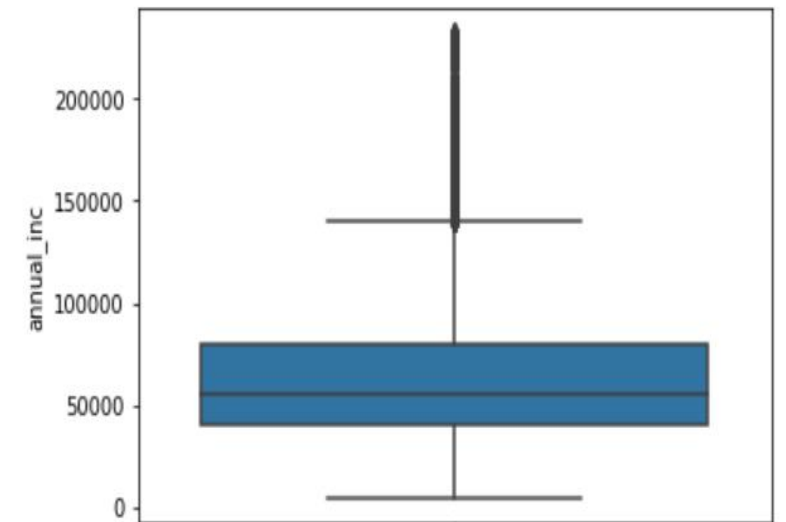
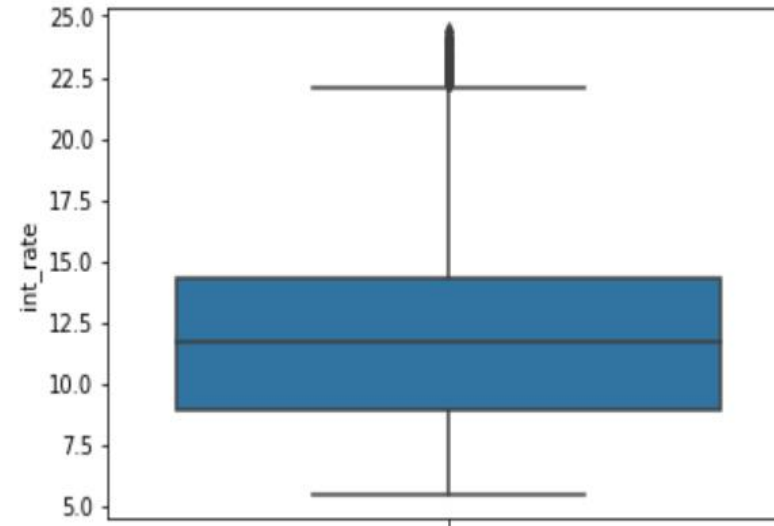
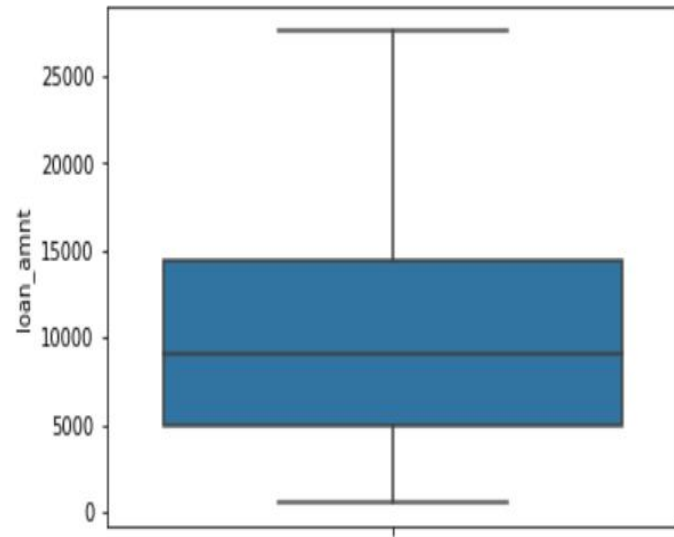
By performing Bivariate analysis we can observe that correlation between variables and get some insights from them.

- There are multiple States with high probability of chargeOff, highest being '**NV**' at 7%.
- Applicants who has taken loan for the purpose of '**small business**' has highest rate of Default i.e 26%
- As **Grade** of applicants decrease the probability of chargeOff increases i.e for grade G Defaulted rate is 35%
- The count of **public bankruptcies** increases the probability of chargeOff increases.

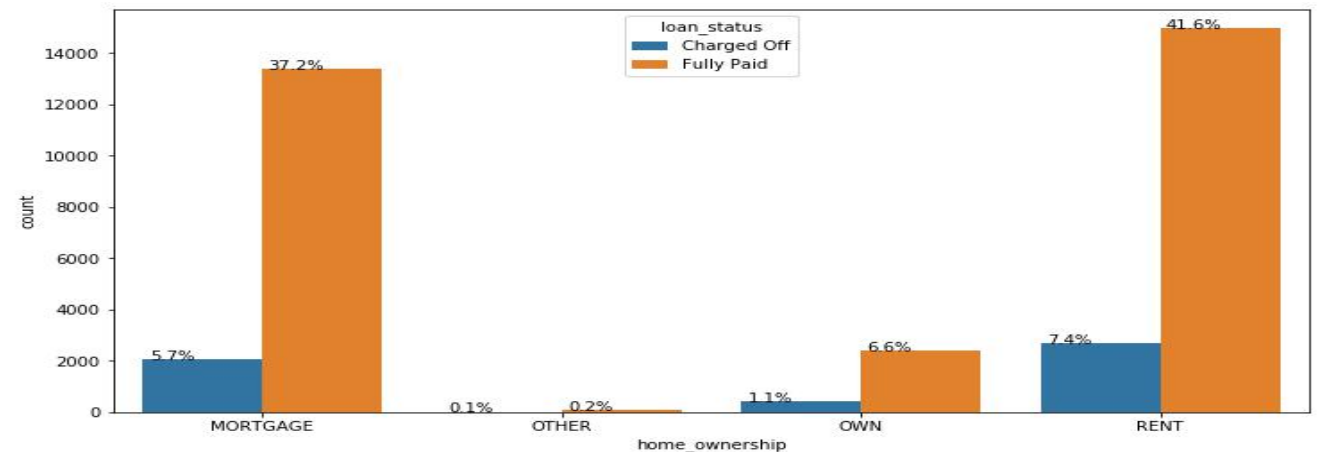
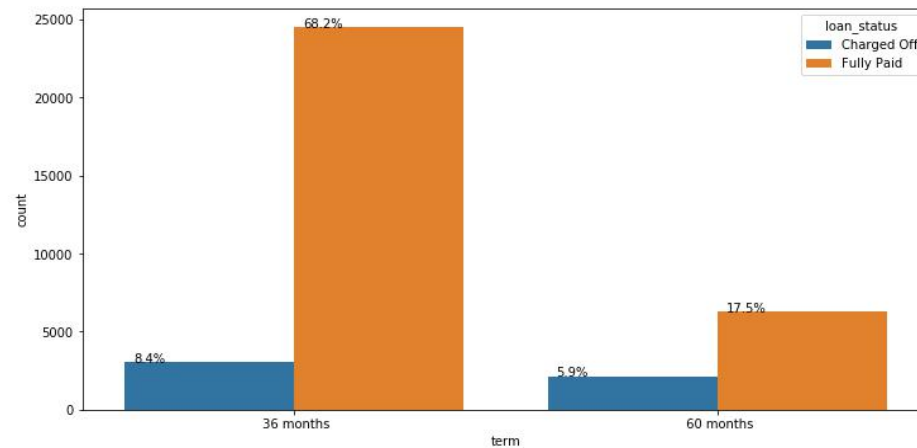
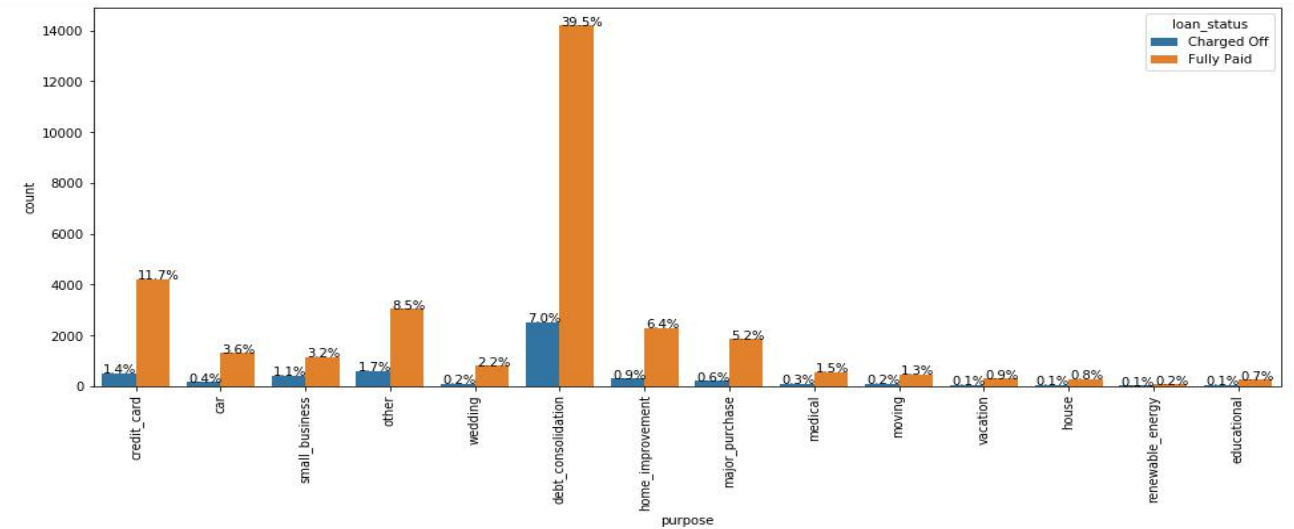
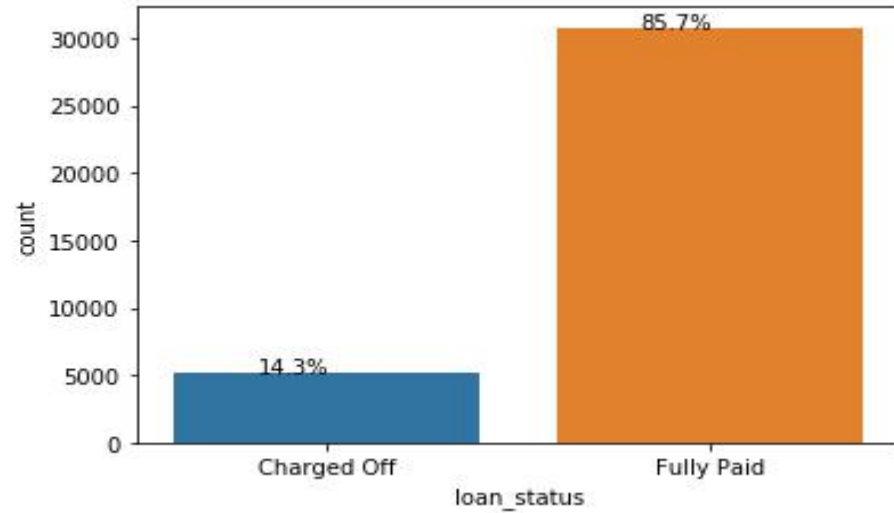
Analysis

- The applicants who has **interest** rate above 15% has higher rate of Defaulting the loan. i.e 25%
- The applicants who has **annual income** less than 25000 has highest rate of Default. i.e 20% (As annual income increases the probability of chargeOff decreases.)
- The applicants who has **loan amount** above 25000 has highest rate of Default. i.e 30%
- Applicants who not specified their employee length(Experience) has highest Default rate with 22%

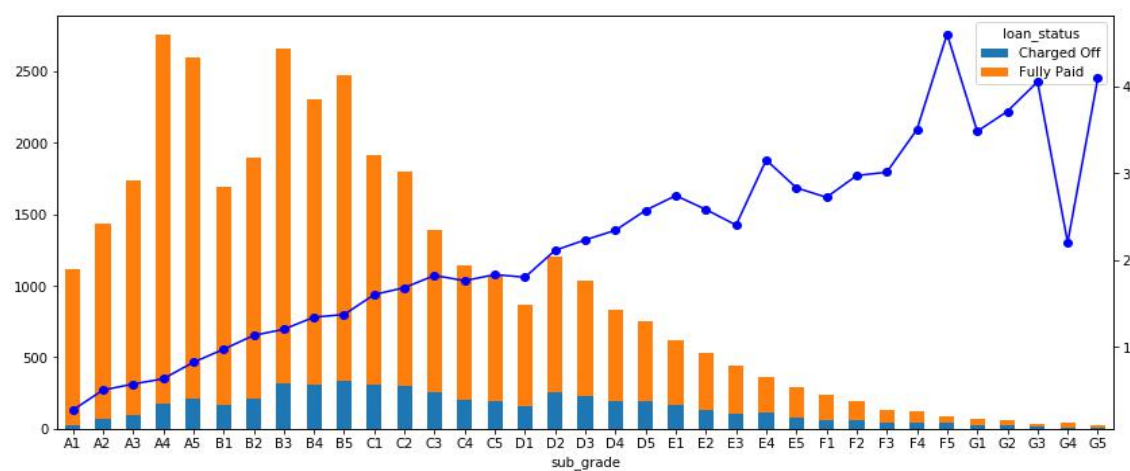
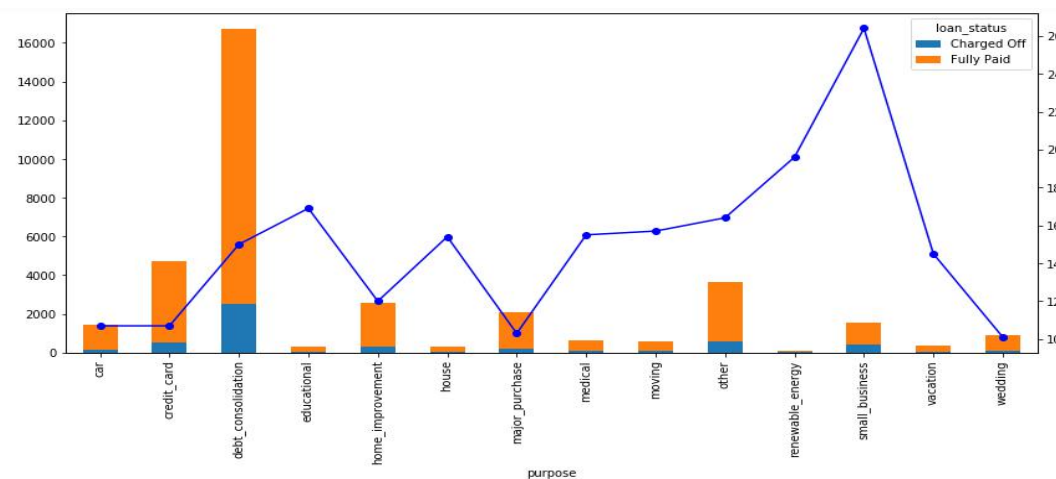
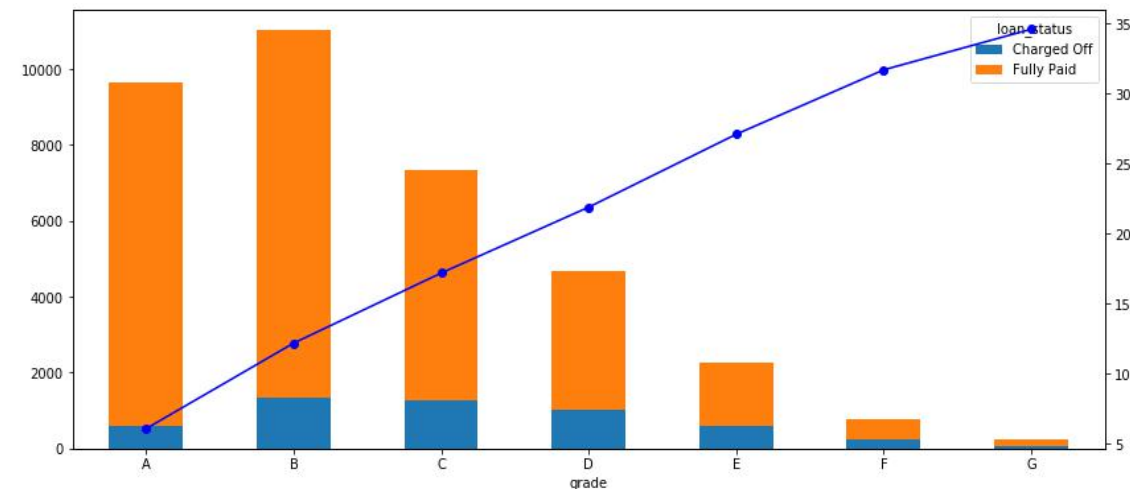
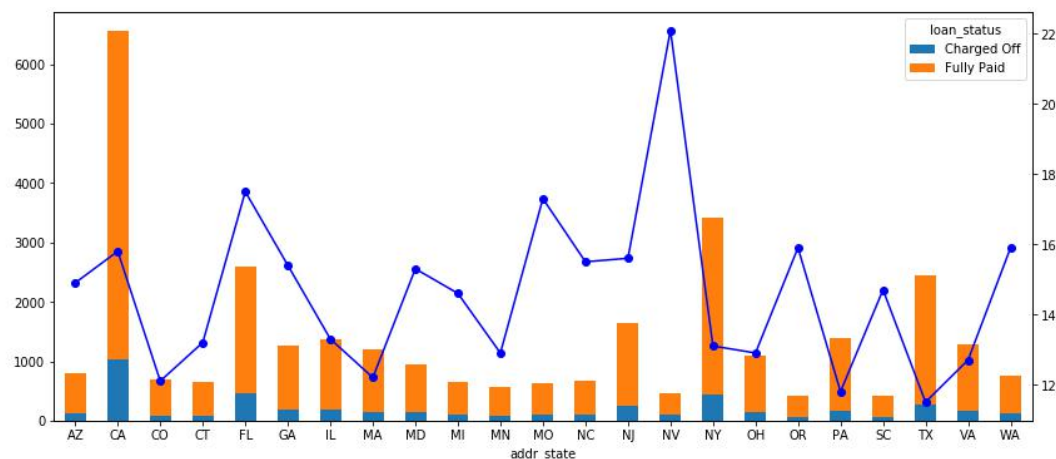
Plots for Univariate Analysis



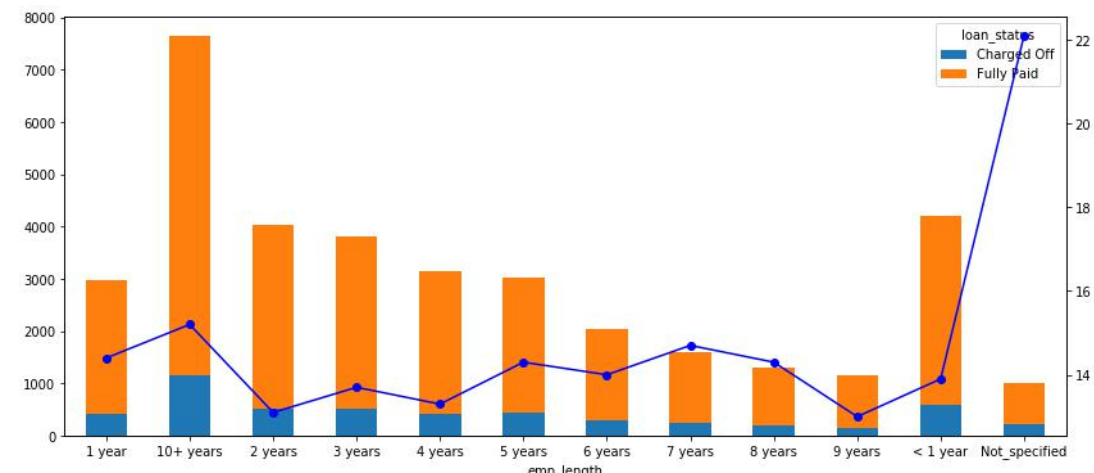
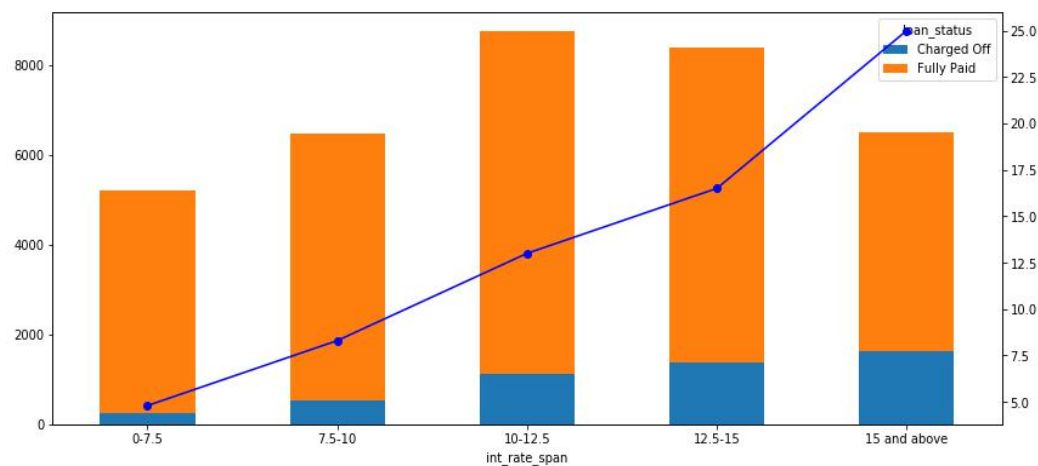
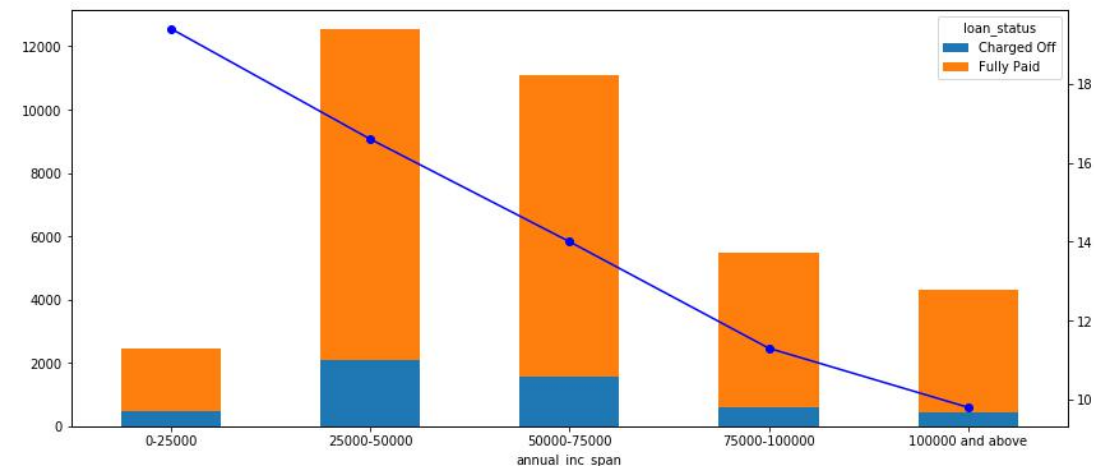
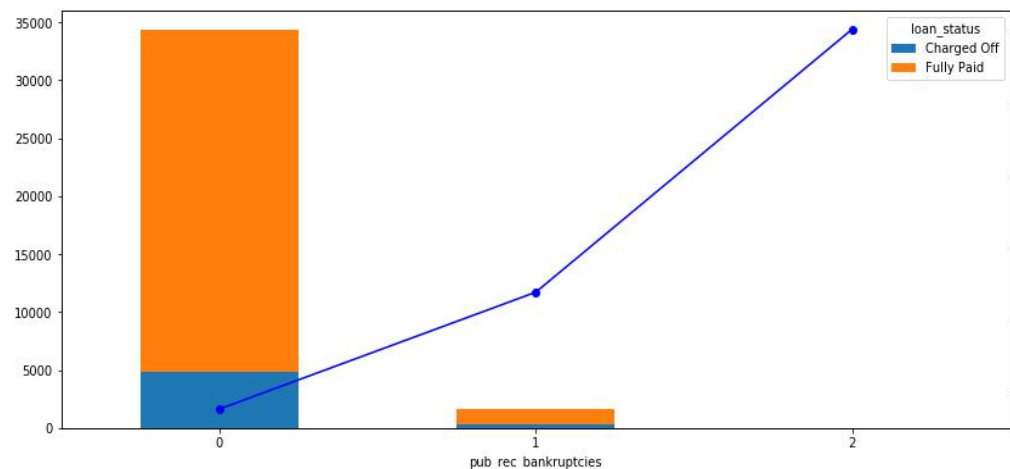
Plots for Univariate Analysis



Plots for Bivariate Analysis



Plots for Bivariate Analysis



Conclusions

By performing different types of analysis such as univariate, segmented univariate and bivariate analysis on different variables , we can observe there many variables which are indicators of loan Default.

Following variables are strong Indicators of default :

1. Purpose of loan
2. Grade
3. Interest rate
4. Annual income
5. Loan amount
6. Employee Length
7. Public bankruptcies