# Lending Club Case Study

SUBMISSION

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Lending Club Case Study

This consumer finance company deals in lending various types of loans to urban customers. When the company receives a loan application, the company must decide for loan approval based on the applicant's profile. When a person applies for a loan, there are **two types of decisions** that could be taken by the company:
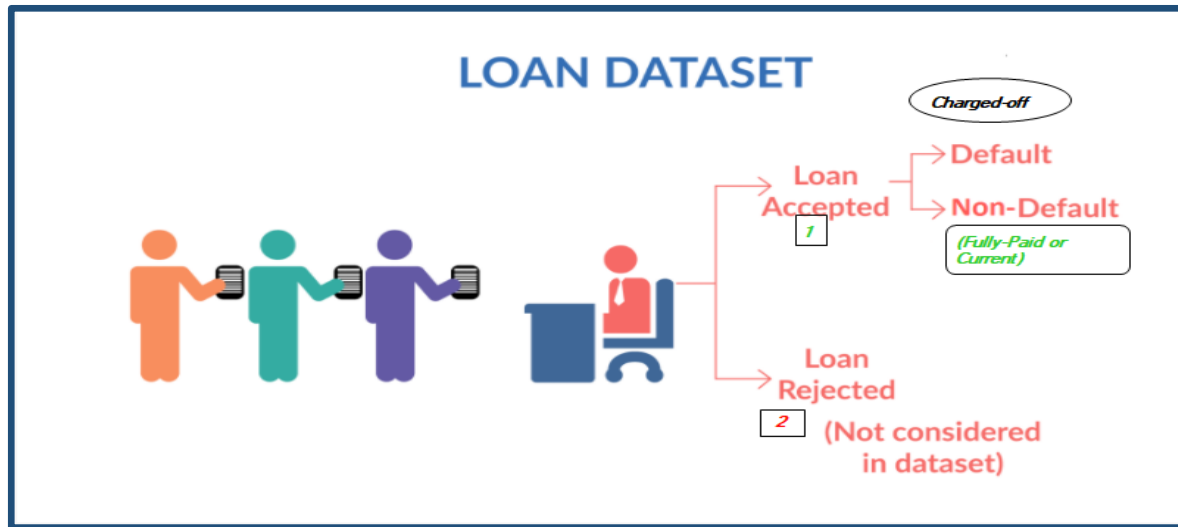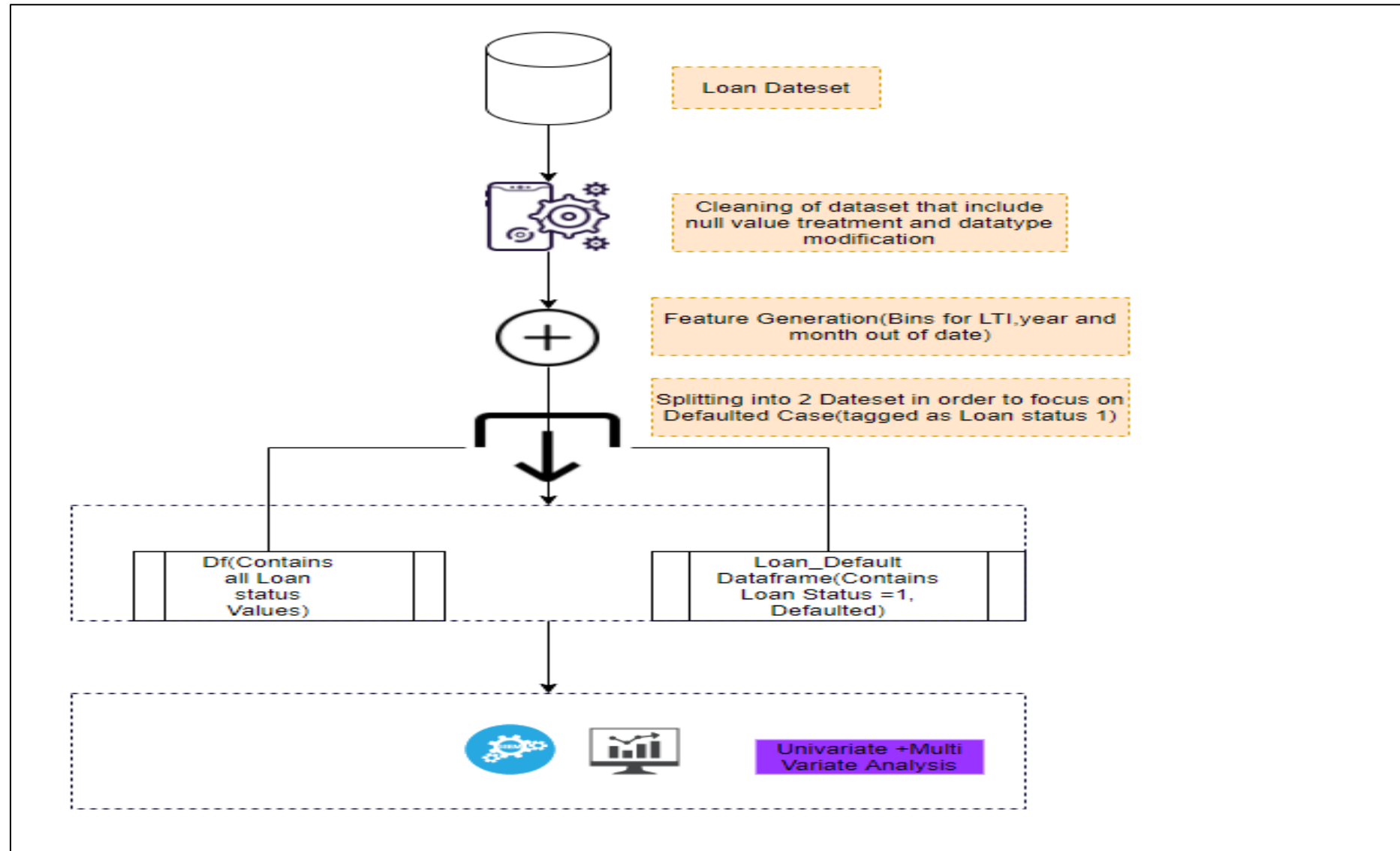

Two **types of risks** are associated with the bank's decision of loan accepted and rejected that are , whether the applicant is :
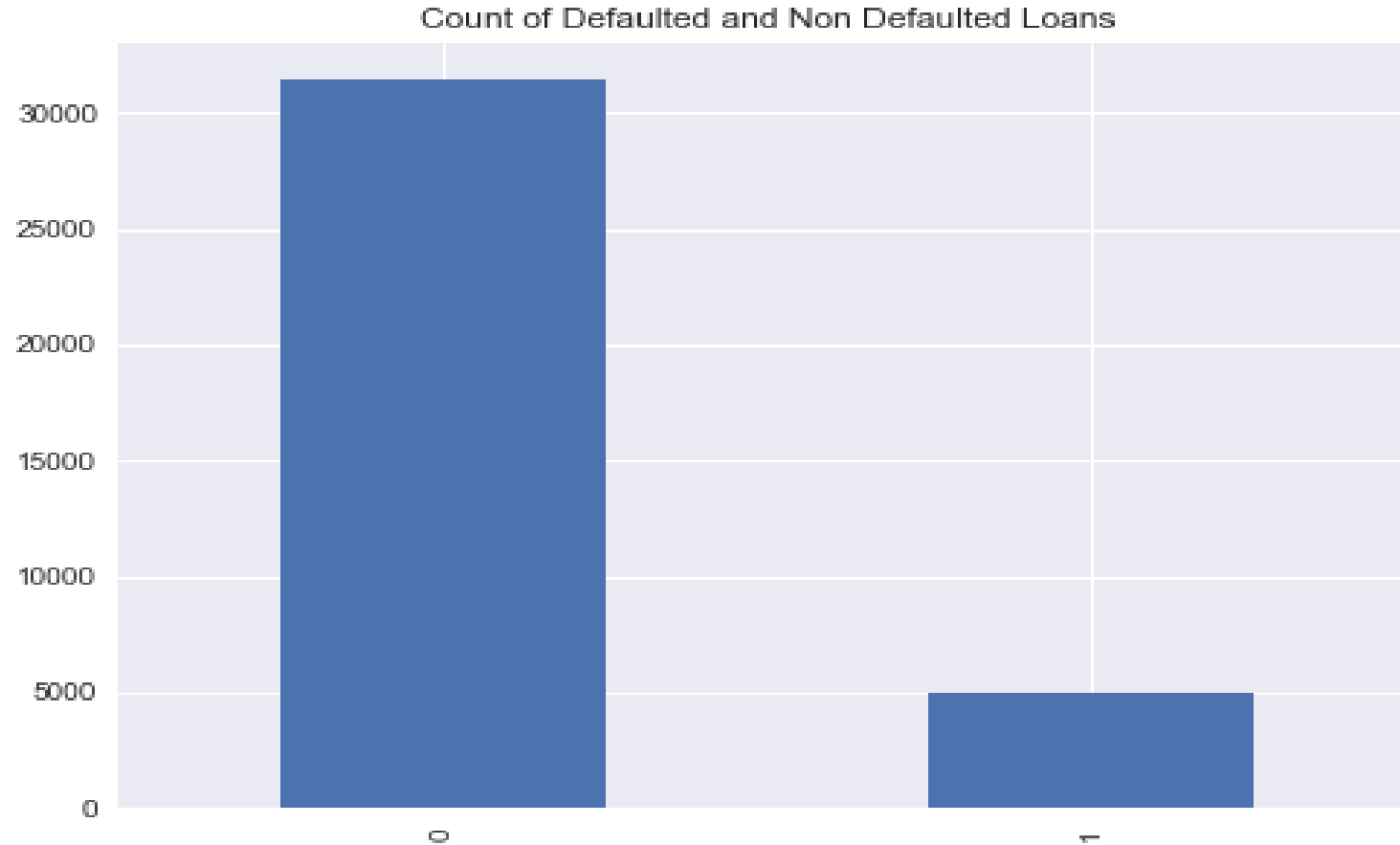
- **likely to repay the loan**, then not approving the loan results in a **loss of business** to the company

- **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

So it is important to understand **consumer attributes** and **loan attributes** that influence the tendency of default(Charged-off).

Approach

Loan Dateset

Cleaning of dataset that include null value treatment and datatype modification

Feature Generation(Bins for LTI,year and month out of date)

Splitting into 2 Dateset in order to focus on Defaulted Case(tagged as Loan status 1)

Df(Contains all Loan status Values)

Loan_Default Dataframe(Contains Loan Status =1, Defaulted)

Univariate +Multi Variate Analysis

Count of Loans(0 – Fully Paid/Current, 1 – Charged off)
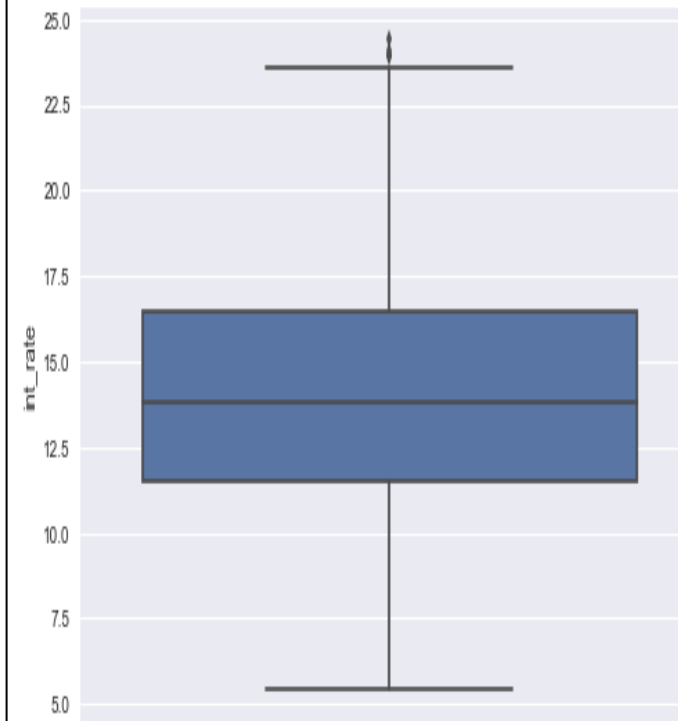

Count of Defaulted and Non Defaulted Loans

Observation : There are 31414 loans that are not defaulted yet while there are 4943 loans that are defaulted

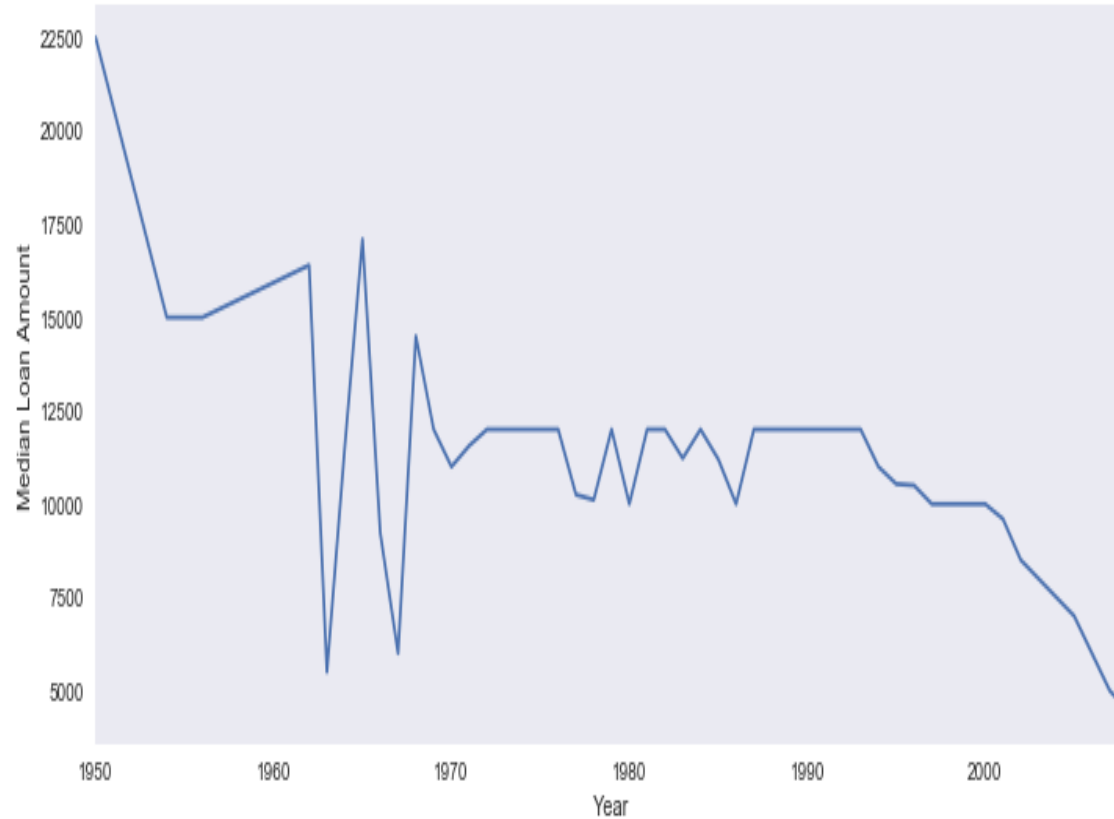# Overall Loan Vs Defaulted Loan Rate of Interest
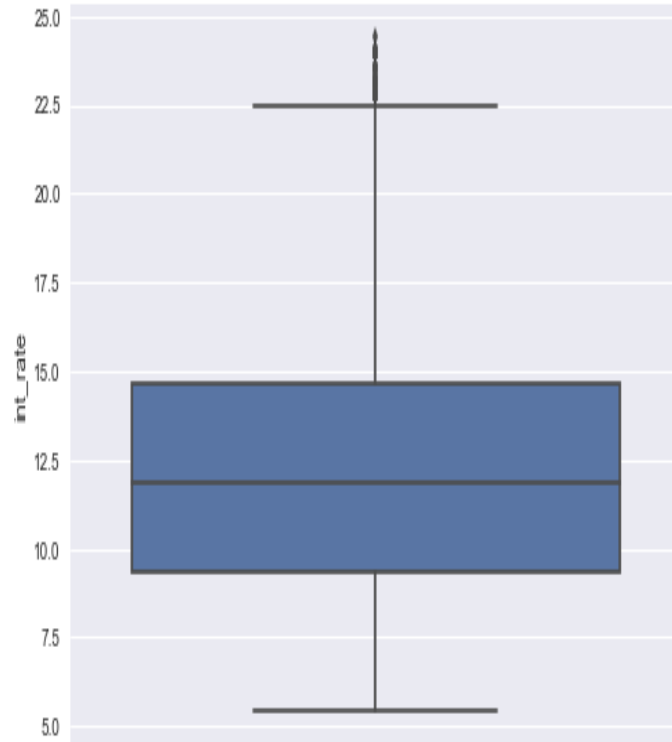
Observation - we can see few outlier above 22.5 interest rate , maximum loans are spread in between 10 to 15 % interest Rate

Observation - For all defaulter, Interest rate is more ,maximum loans are spread between around 11.5 to 16 % interest Rate
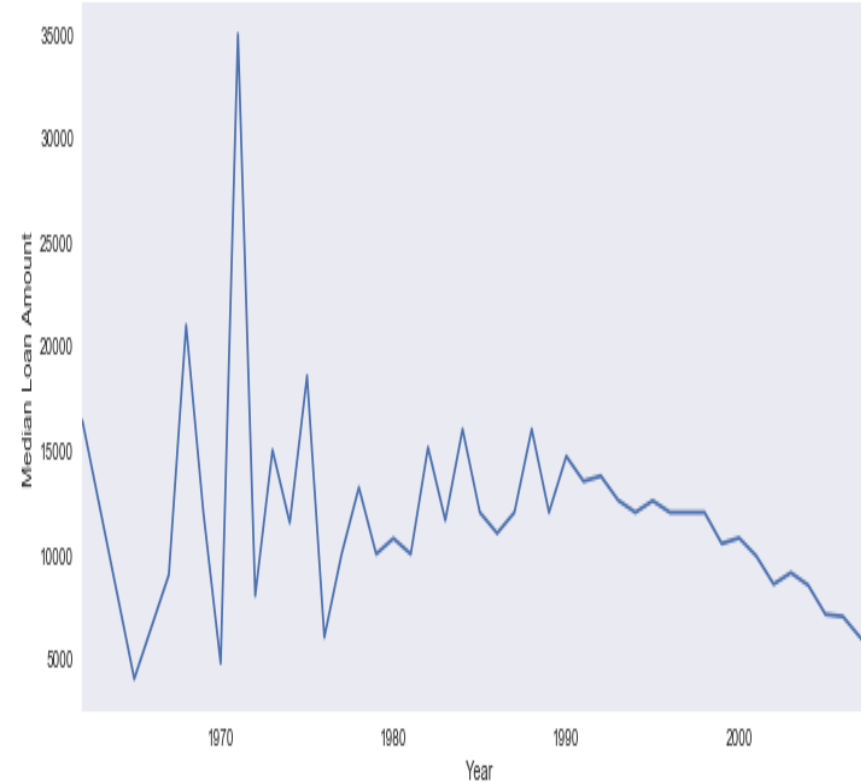
Overall and Defaulted Loan Amount Trend
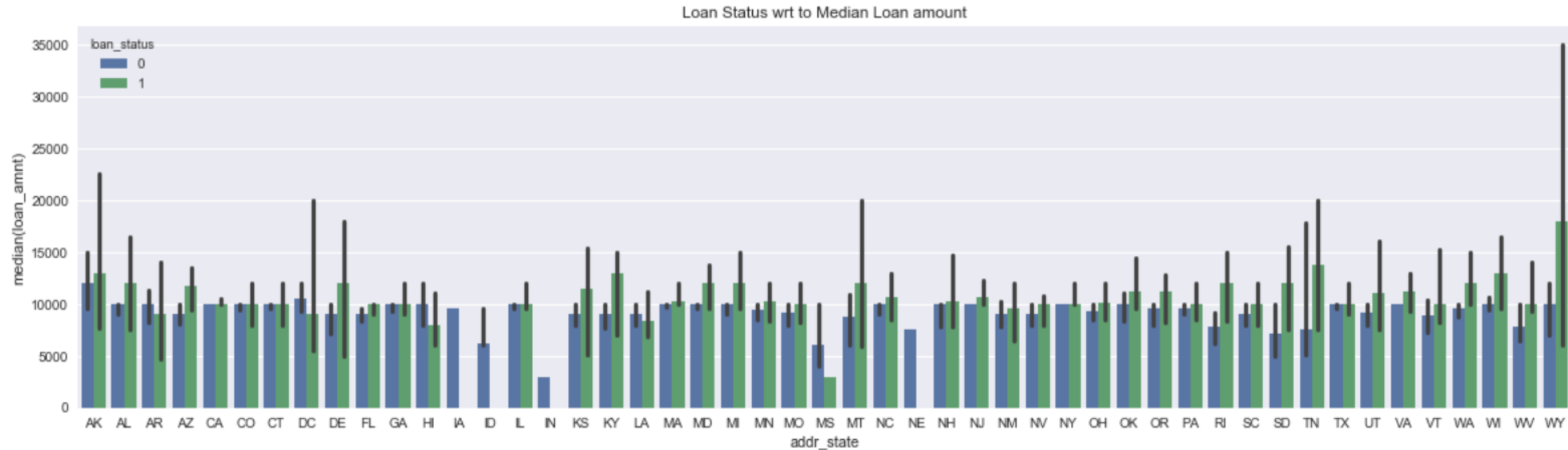

Median Loan Amount over Year

Observation - Loan Amount Median is on decreasing trend so people are taking lower loan amounts
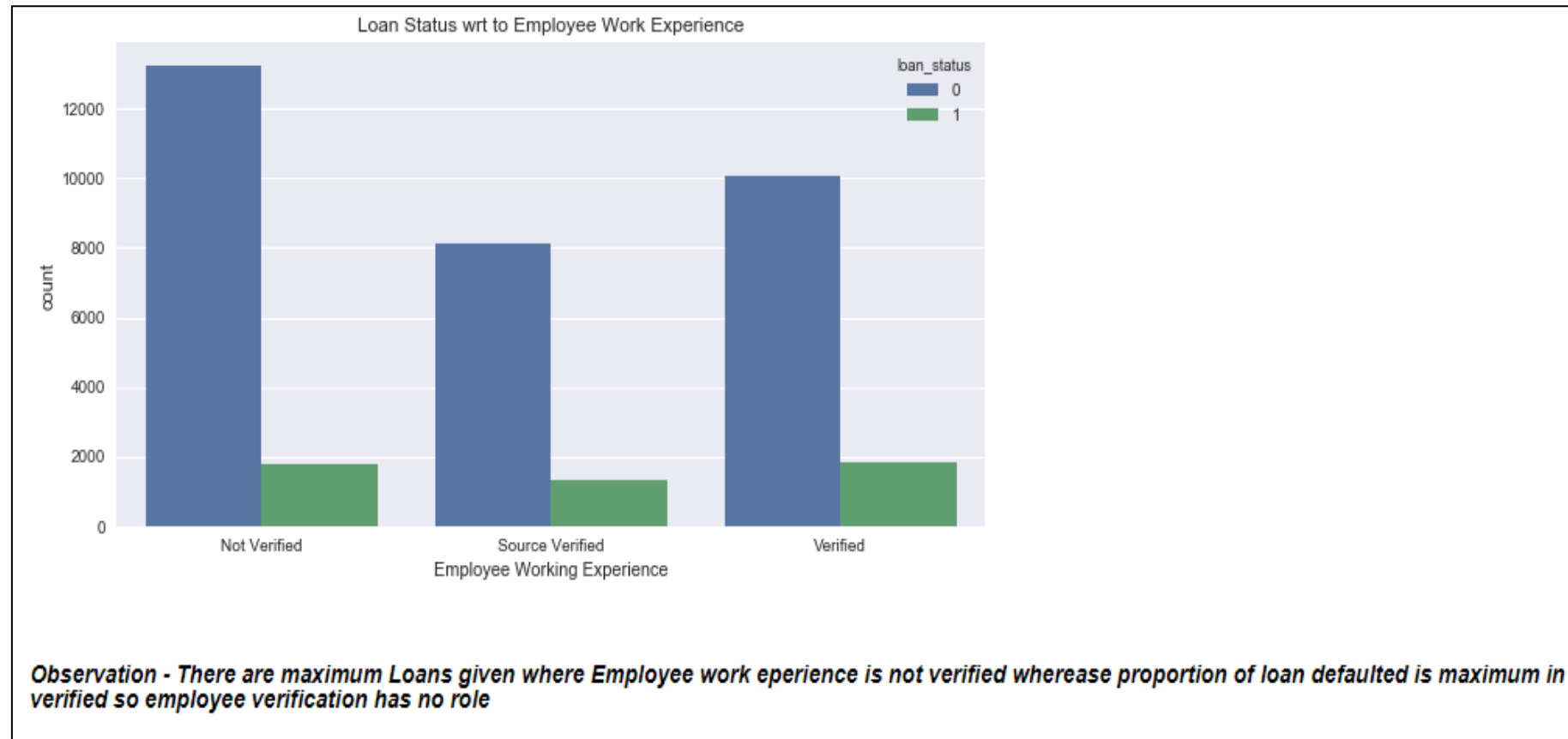

Defaulted Median Loan Amount over Year

Observation - Defaulted Median loan amount is also on lower trend but those were opened in around 1970 to 1975 , there were unusal higher median defauled amount
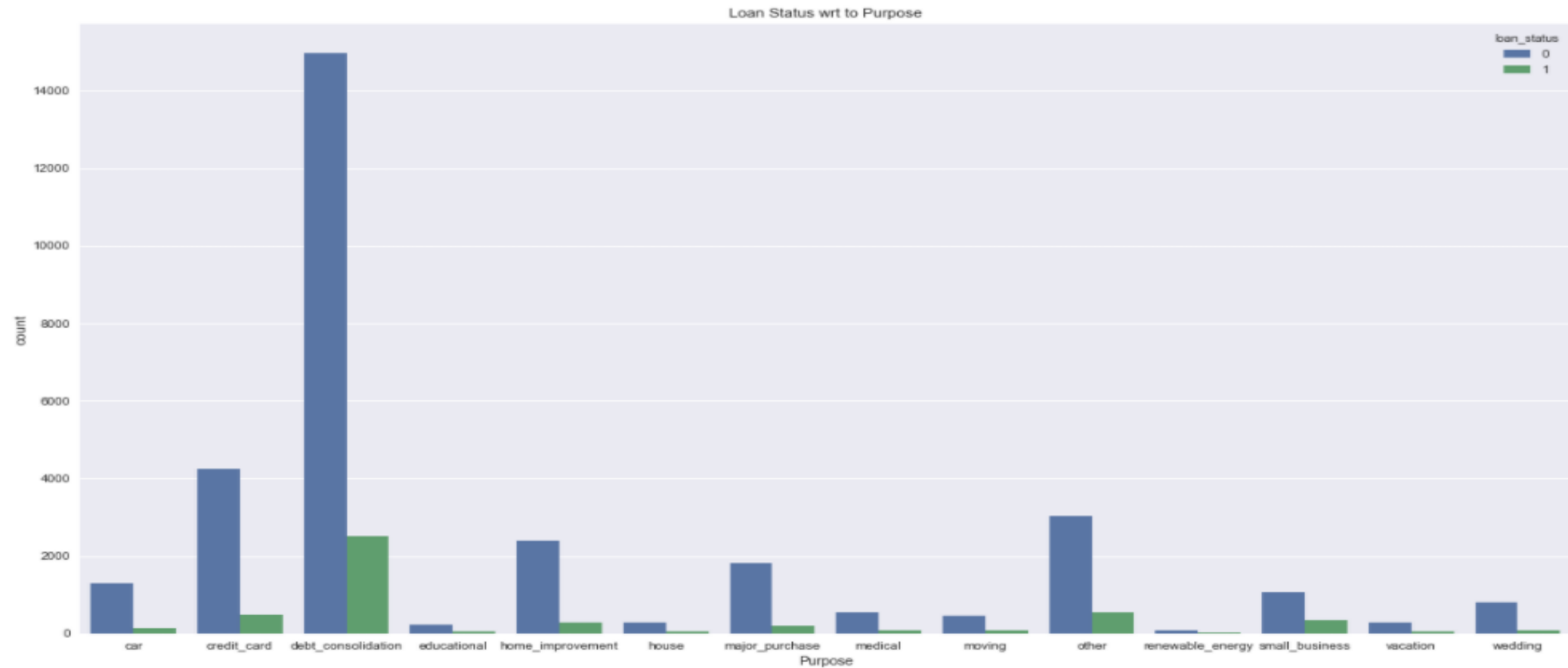
Loan Status State Wise

Loan Status wrt to Median Loan amount

Observation - Max median Loan Amount was taken by WY State. Also there are states like NE, IN, ID and IA where there are no Loan Defaulted

Loan Status vs Employee Work Experience

Loan Status wrt to Employee Work Experience

Observation - There are maximum Loans given where Employee work eperience is not verified wherease proportion of loan defaulted is maximum in verified so employee verification has no role
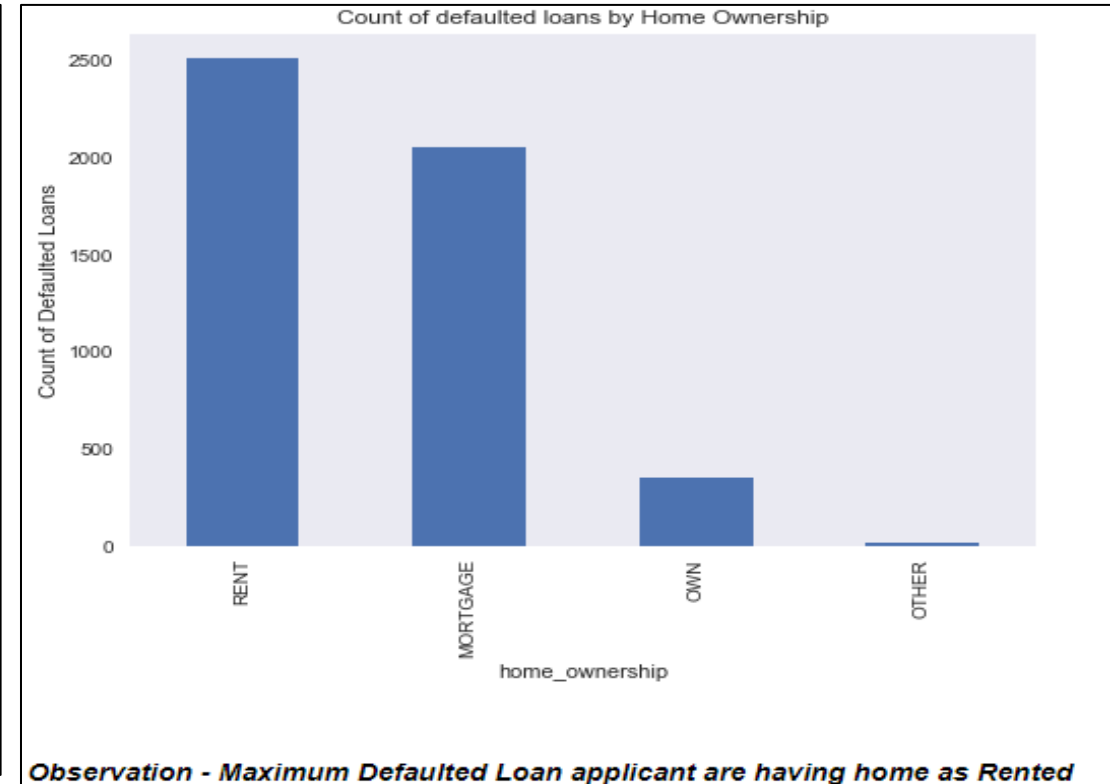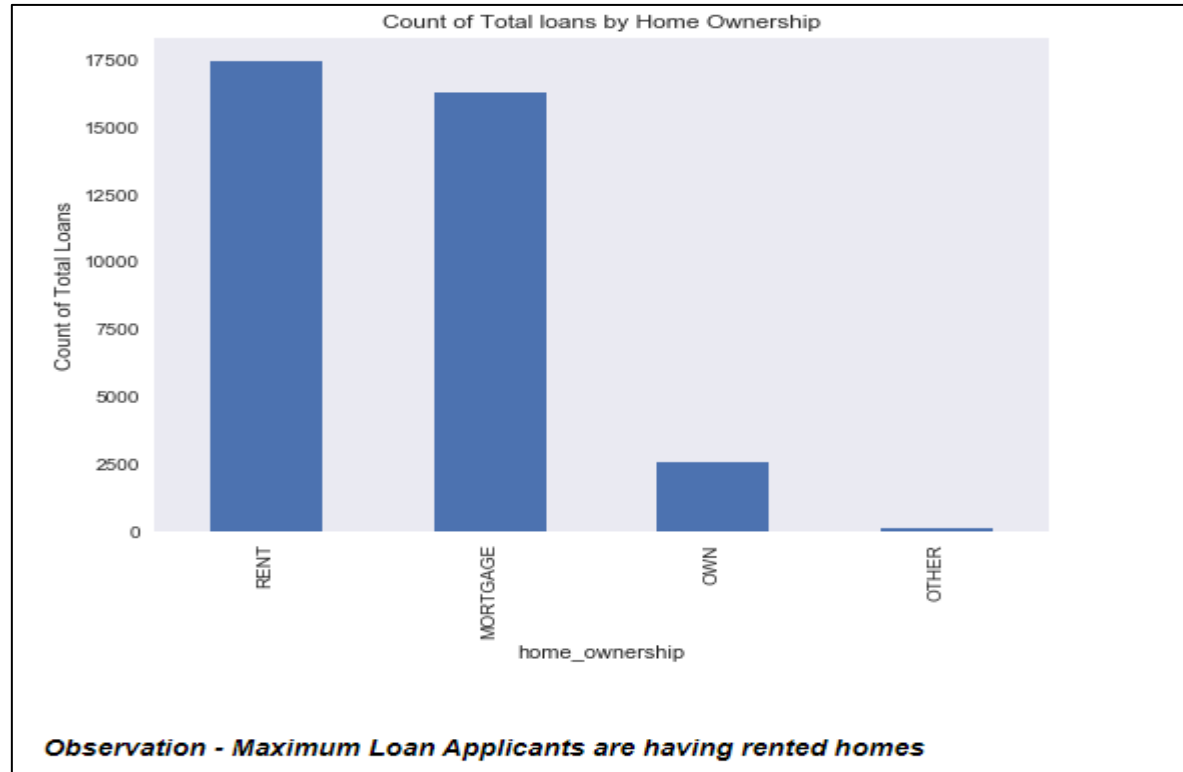
Loan Status vs Purpose

Loan Status wrt to Purpose

Observation - Maximum Loan are taken for Debt-consolidation purpose so it has max number of defaulted loan too, although ratio of defaulted loan by total loan is max for small_business

Loan Status With respect to Home Ownership

Count of Total loans by Home Ownership

Observation - Maximum Loan Applicants are having rented homes

Count of defaulted loans by Home Ownership

Observation - Maximum Defaulted Loan applicant are having home as Rented

```
home_ownership
RENT          14.402891
MORTGAGE      12.646154
OWN           13.551402
OTHER         19.148936
Name: loan_status, dtype: float64
```

Observation - Default Ratio of home ownership as other is maximum that is 19.14 % and then comes home as rented that is 14.40 %

Overall and Defaulted Loan Count Wrt to Grade

Loan count wrt to Grade
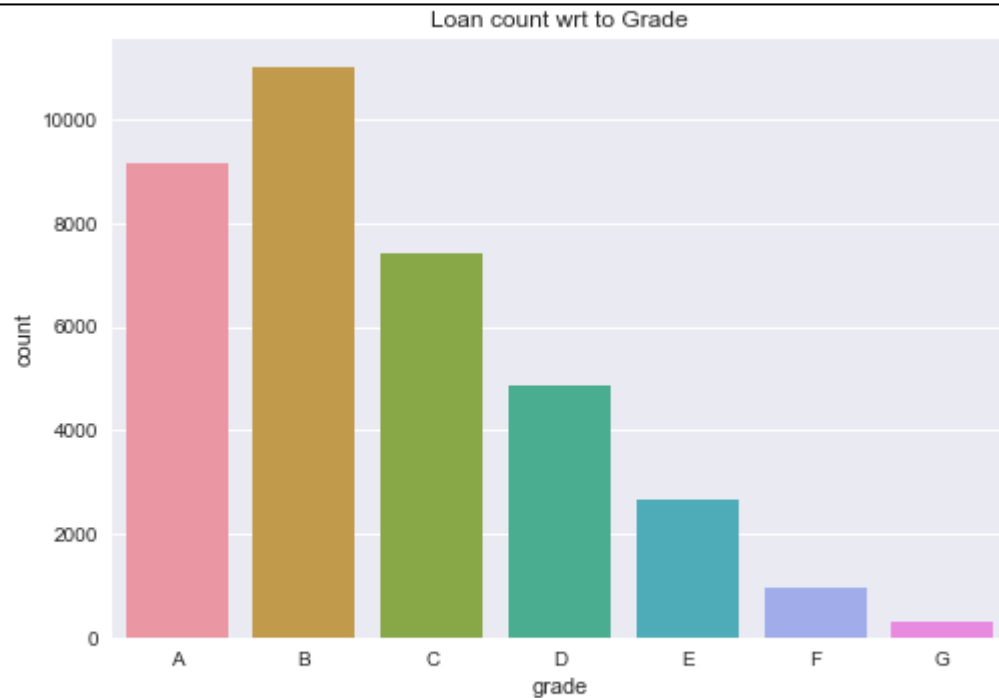
Observation - There are maximum Number of Grade B Applicants
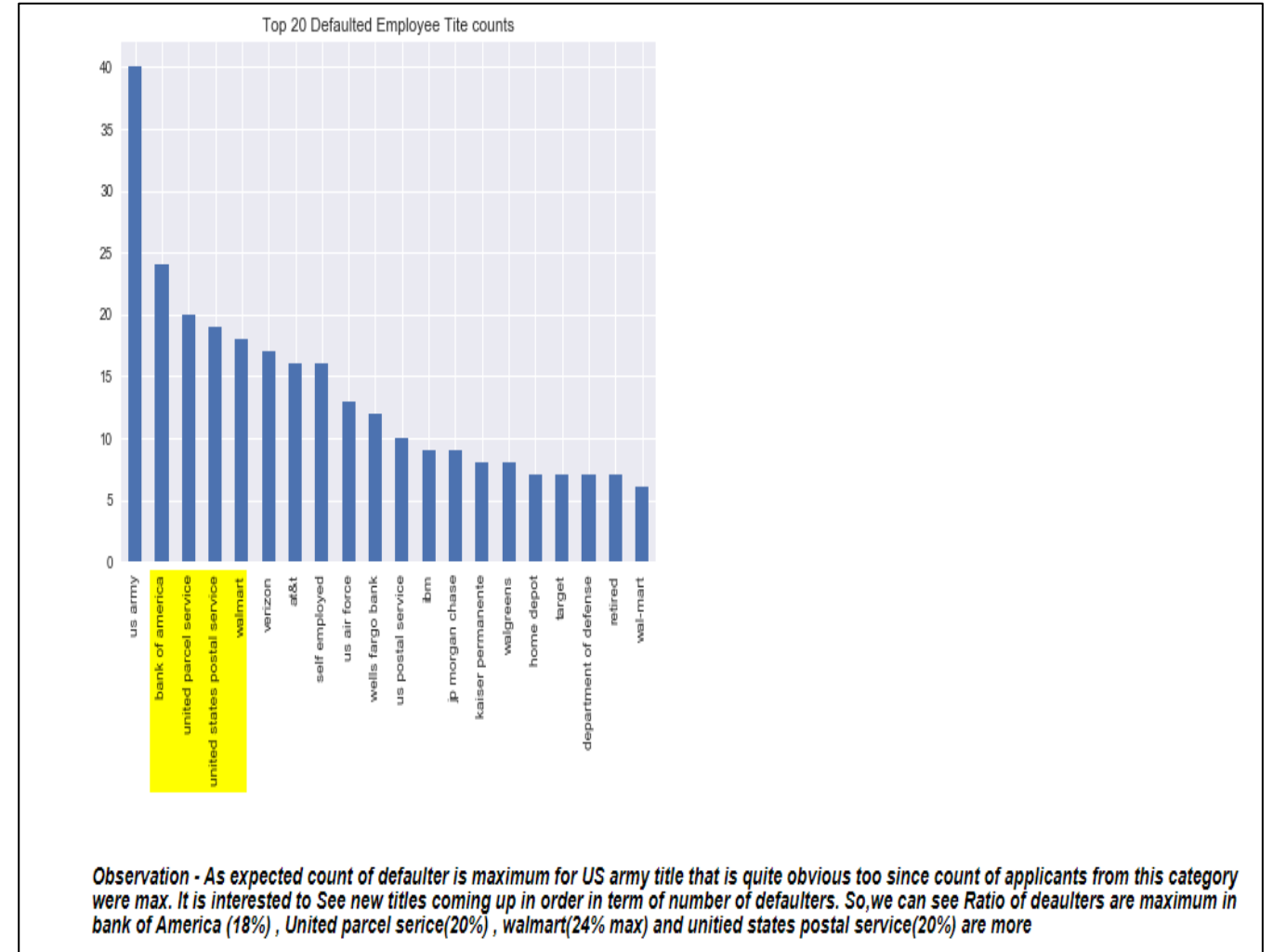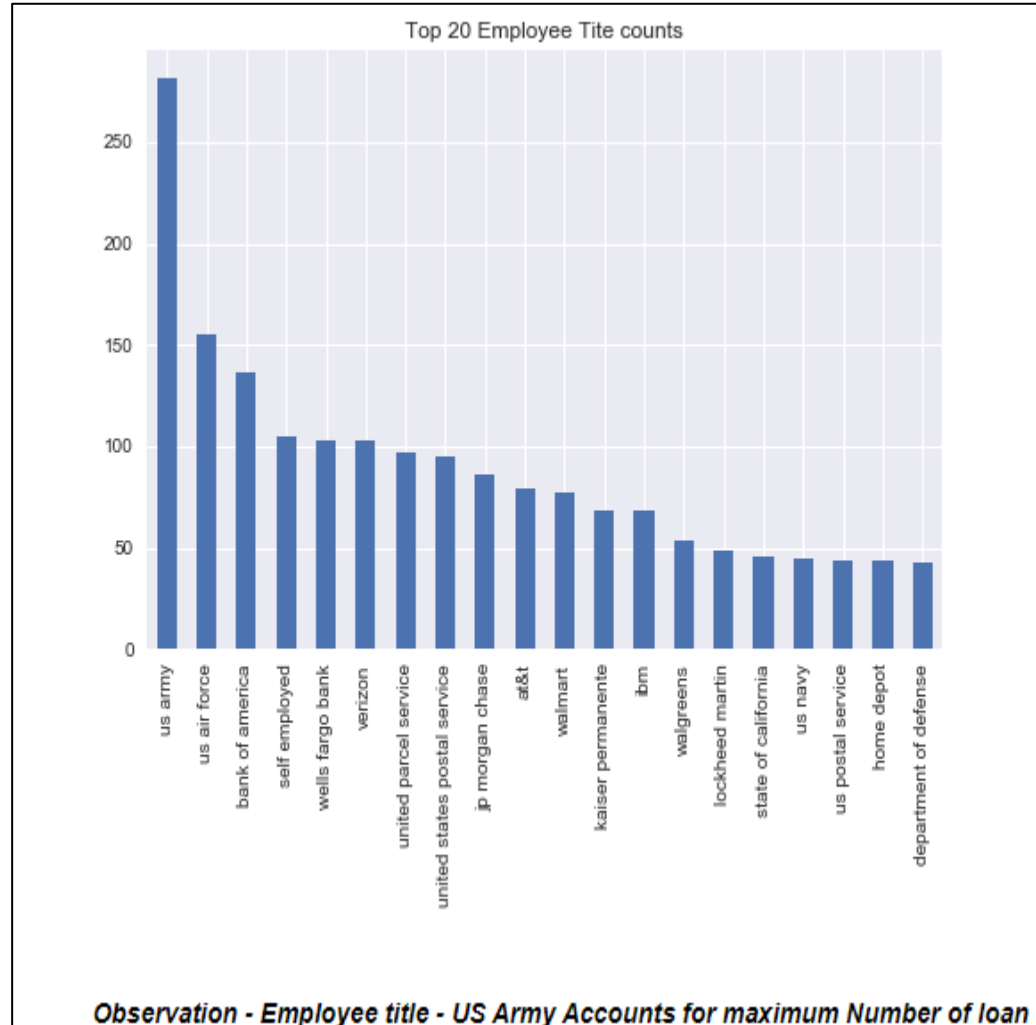

Defaulted Loan count wrt to grade
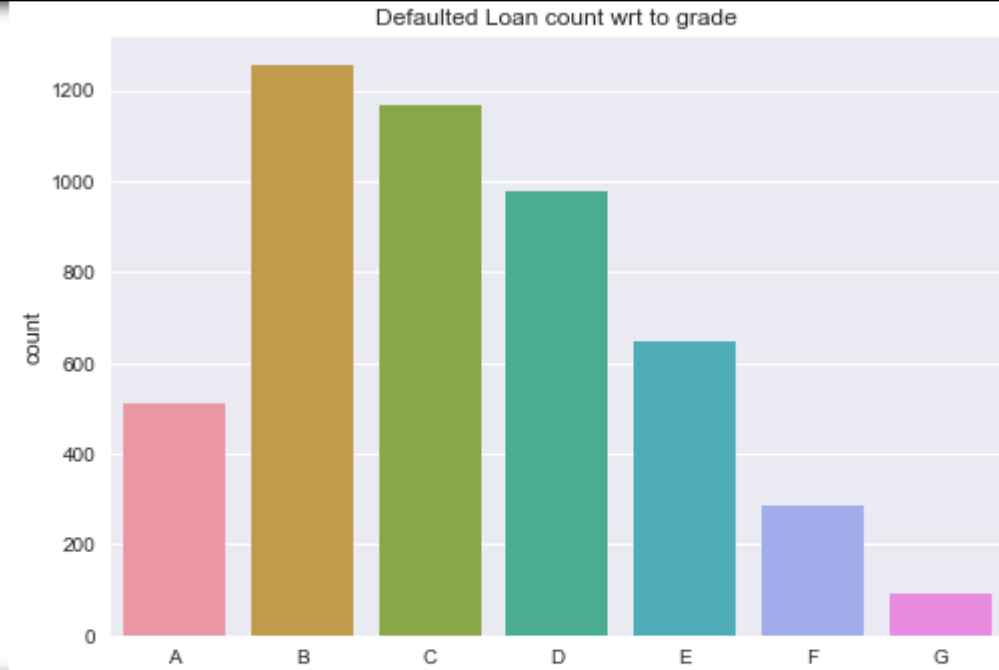
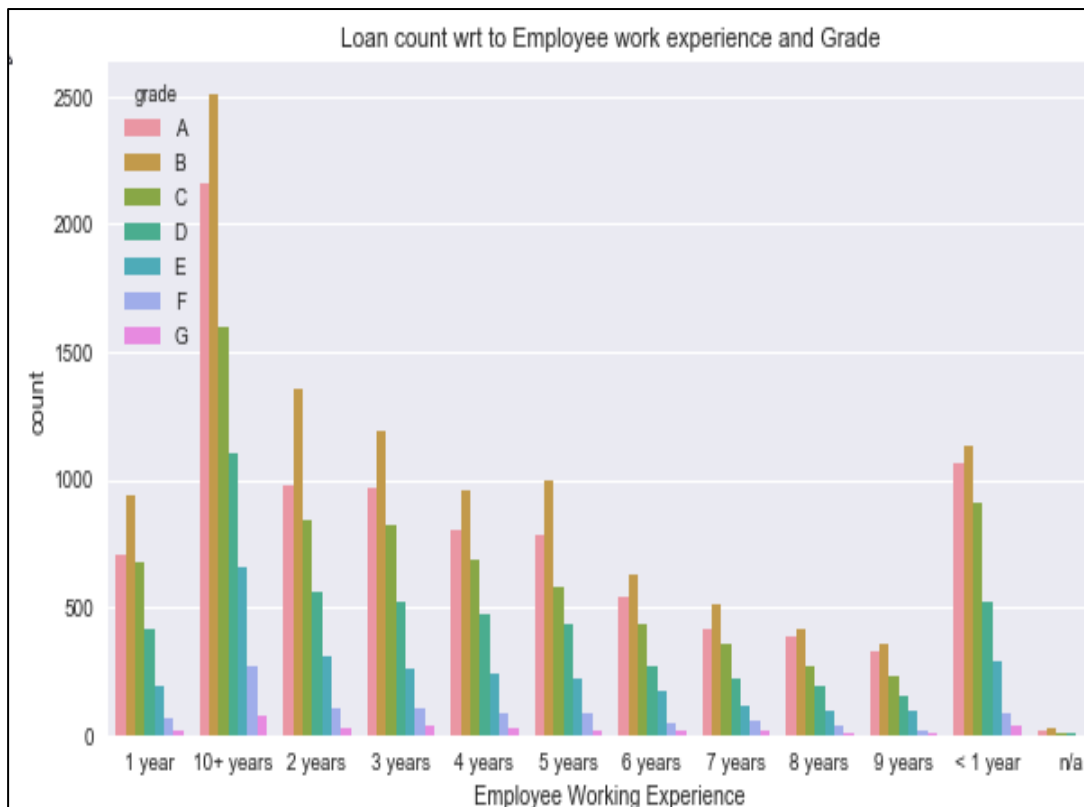Although There were maximum number of Grade applicants but we

saw here ratio of Defaulters are maximum for C, D,E, F and G grade people are maximum

while for A its least

Top 20 Employee count for all Loan Status Vs Defaulted Loans

Top 20 Employee Tite counts

Observation - Employee title - US Army Accounts for maximum Number of loan

Top 20 Defaulted Employee Tite counts

Observation - As expected count of defaulter is maximum for US army title that is quite obvious too since count of applicants from this category were max. It is interested to See new titles coming up in order in term of number of defaulters. So,we can see Ratio of deaulters are maximum in bank of America (18%) , United parcel serice(20%) , walmart(24% max) and unitied states postal service(20%) are more

Overall Loan and Defaulted loan Status wrt to Work Experience and Grade

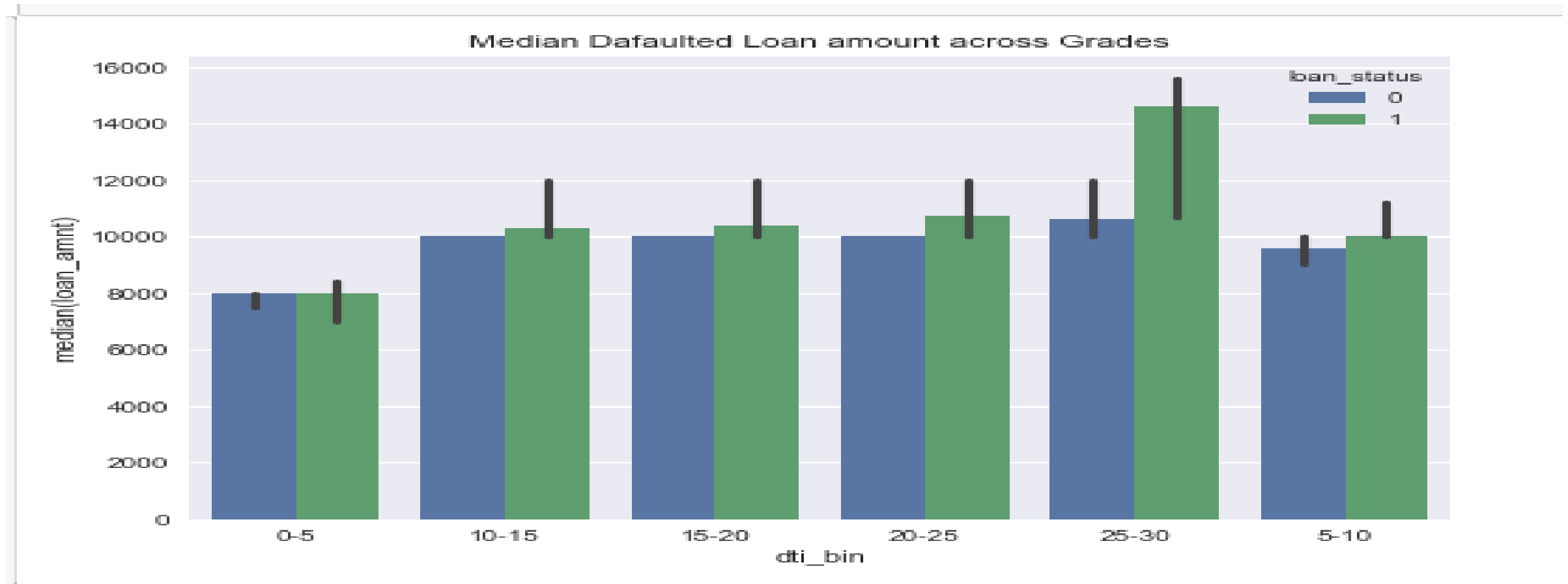Observation - Maximum Employee with 10+ years and grade B of work take loans

Maximum Employee 10+ year of work experience with grade B defaulted the most too ,

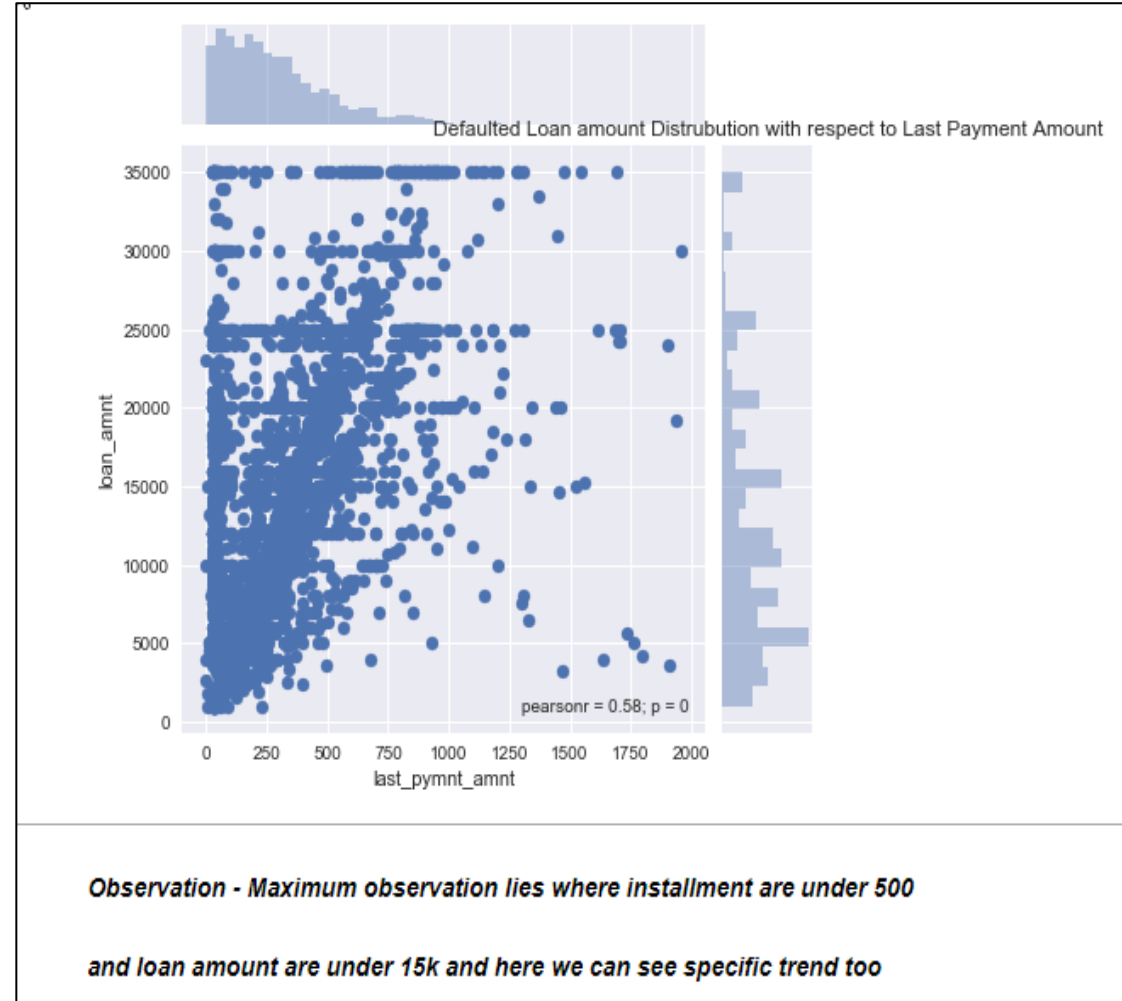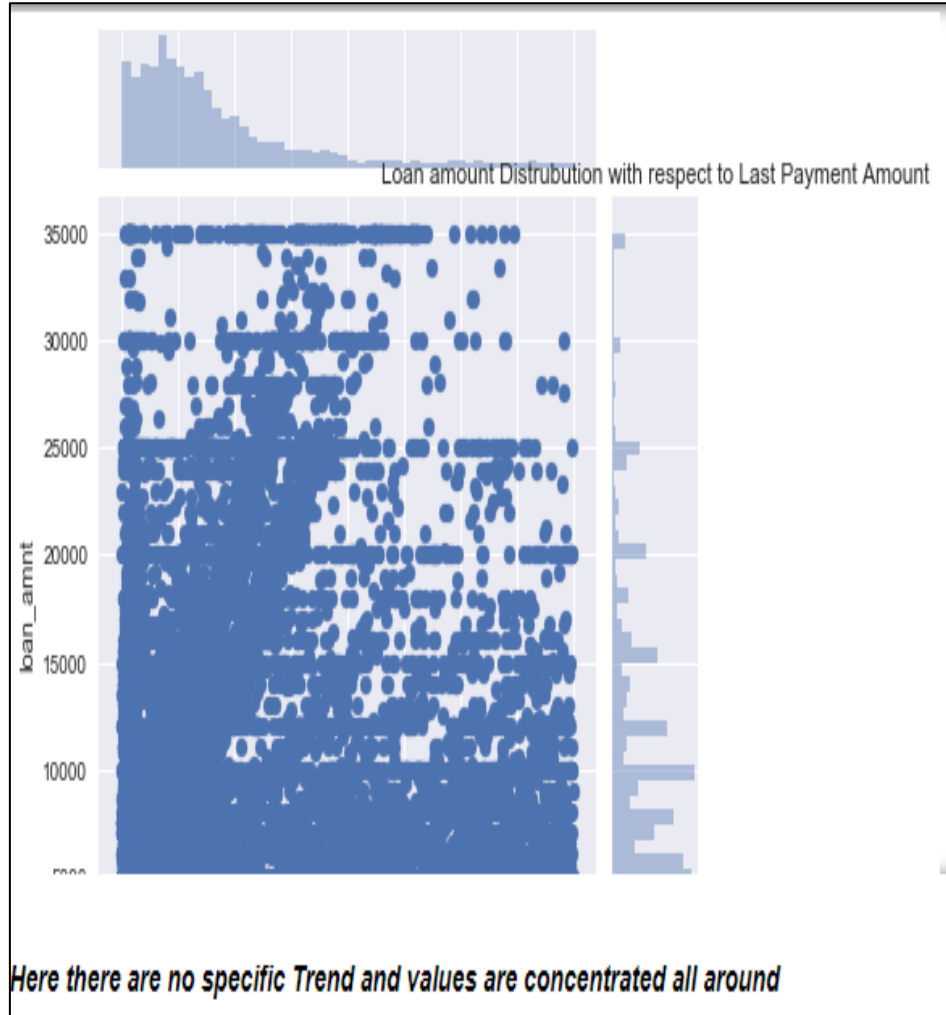**but here we noticed that ratio of defaulted loans is quite less for grade A , 10 + work ex**

employee so that seems suitable category, Similar trend we can notice all over the work experience

DTI vs Median Loan Amount

Pair Plot Distribution of loan amount and last payment amount for Defaulted and overall Loan Amounts

Loan amount Distrubution with respect to Last Payment Amount

Here there are no specific Trend and values are concentrated all around

Defaulted Loan amount Distrubution with respect to Last Payment Amount

pearsonr = 0.58; p = 0

Observation - Maximum observation lies where installment are under 500

and loan amount are under 15k and here we can see specific trend too

Conclusions

- There are 13.59% of total Loans are defaulted

- People who are likely to default there are following attributes –

❖ Less last Payment amount

❖ More DTI Ratio (25- 30 in our case)

❖ Employee title as Walmart, United State Postal Service, United Parcel Service

❖ Employee Grade other than A

❖ Home Ownership as Others

❖ Purpose is small Business

❖ More Revolving Balance resulting into Higher Int Rate