EDA CASE STUDY

BY – Shyam Patel and Rajat khurana

PROBLEM STATEMENT

- 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.

ABOUT THE DATASET

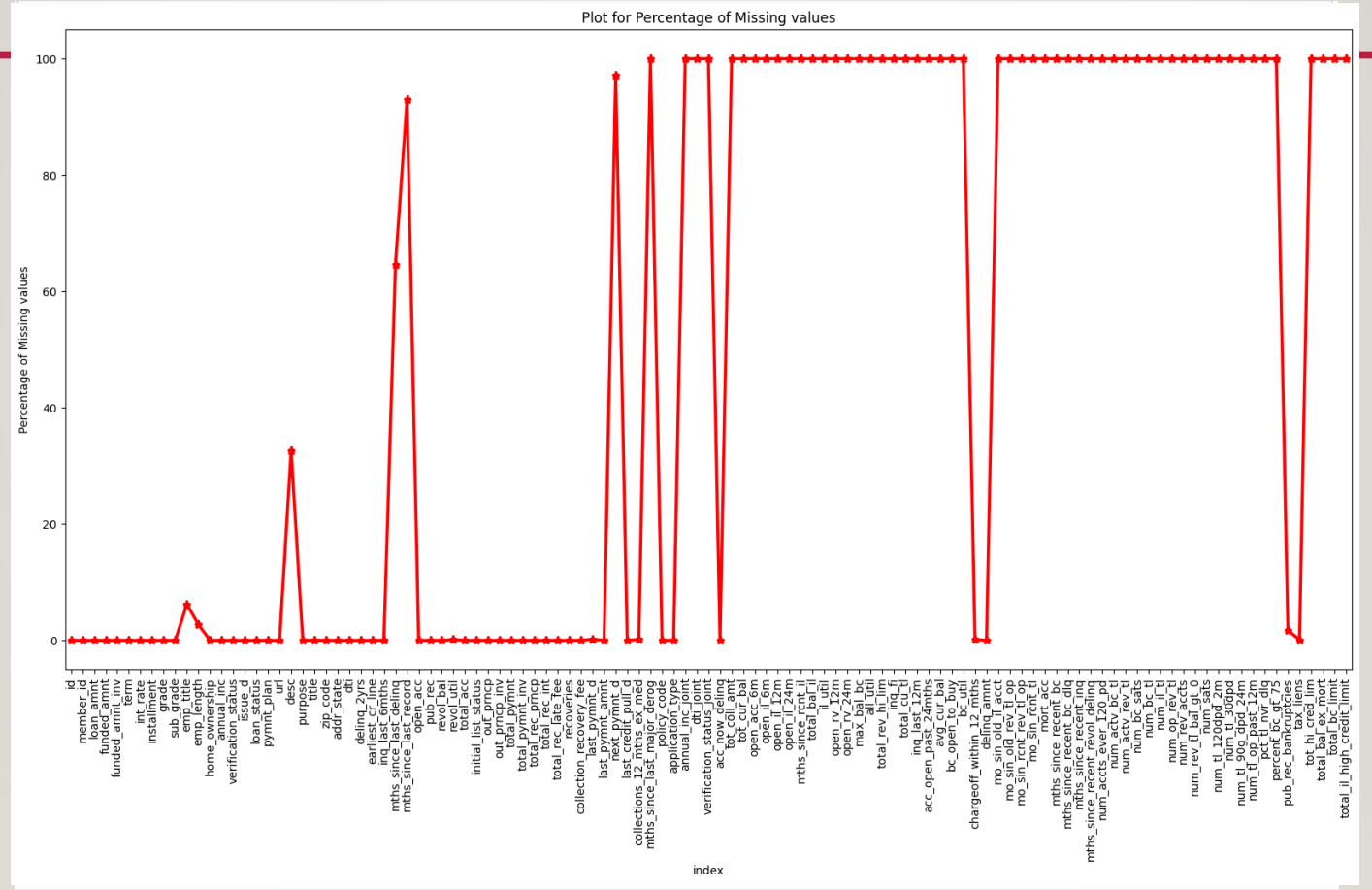
- This dataset has 2 files as explained below:
- **1. 'loan.csv' contains It contains the complete loan data for all loans issued through the time period 2007 t0 2011.**
- **2. 'Data_Dictionary.csv' is data dictionary which describes the meaning of the variables.**

MAJOR STEPS IN ANALYSIS

- ❖ Data Sourcing
- ❖ Data Understanding
- ❖ Checking and Handling Missing values in the data
- ❖ Handling Data Errors
- ❖ Outlier Identification and Analysis
- ❖ Univariate Analysis
- ❖ Bivariate and Multivariate Analysis
- ❖ Finding Top Correlated Features those Support Target Column.

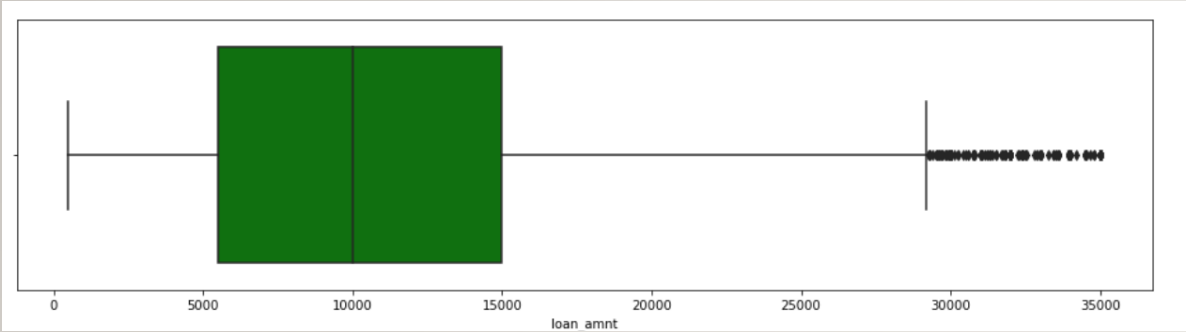
Results on Loan.csv Dataset

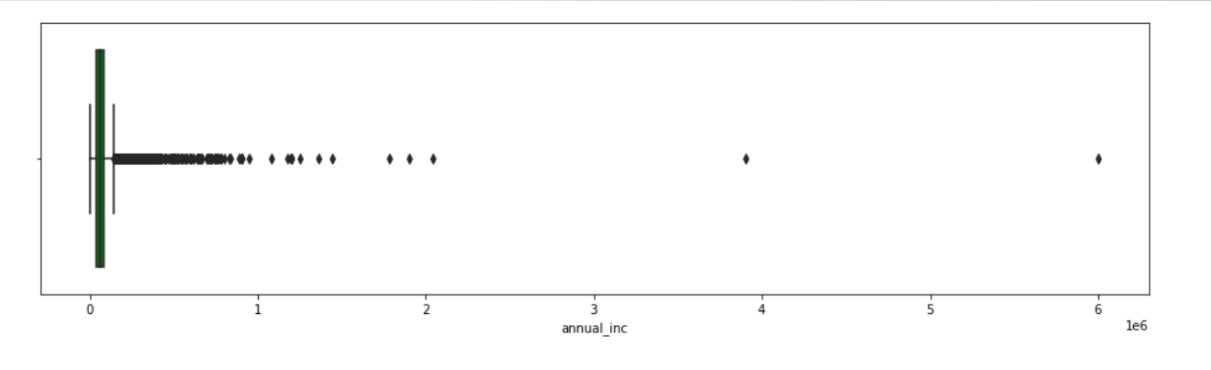
HANDLING MISSING DATA

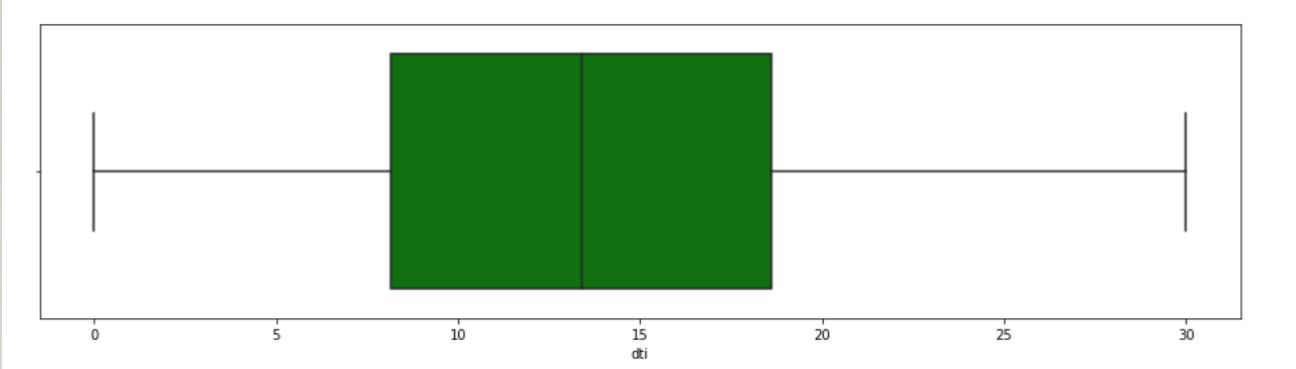


Missing Value percentage in the given Dataset

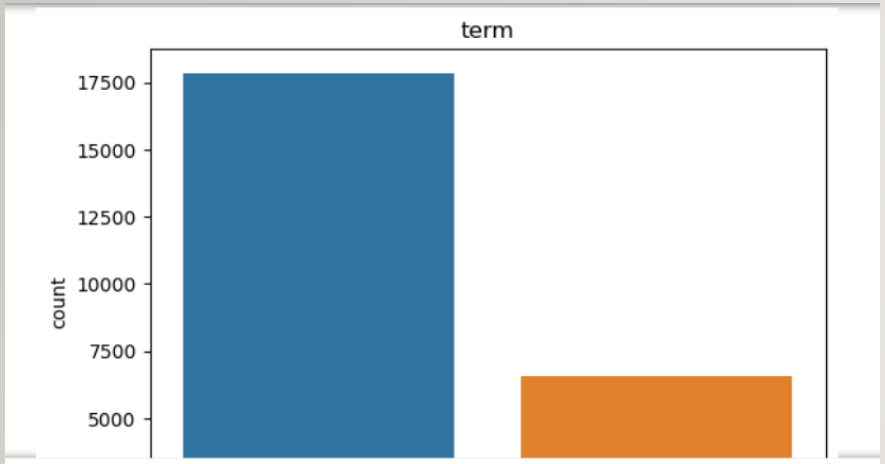
Outlier Analysis

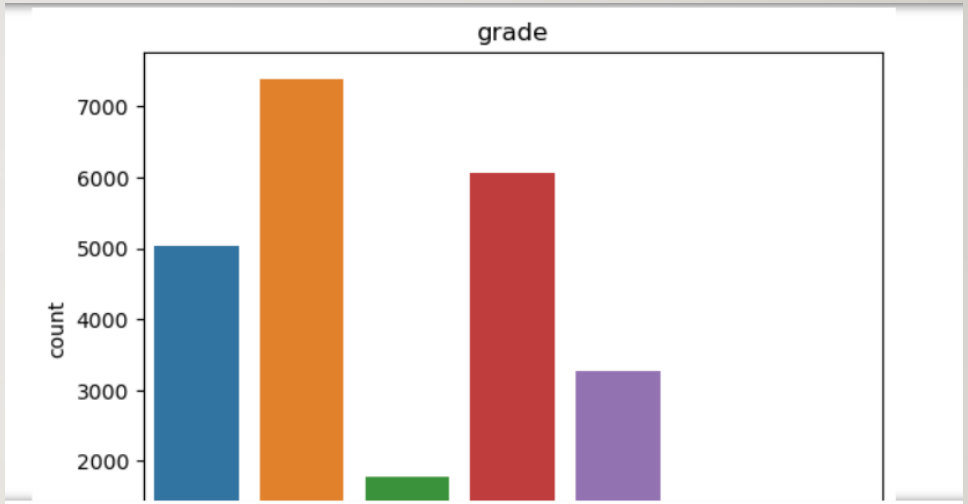


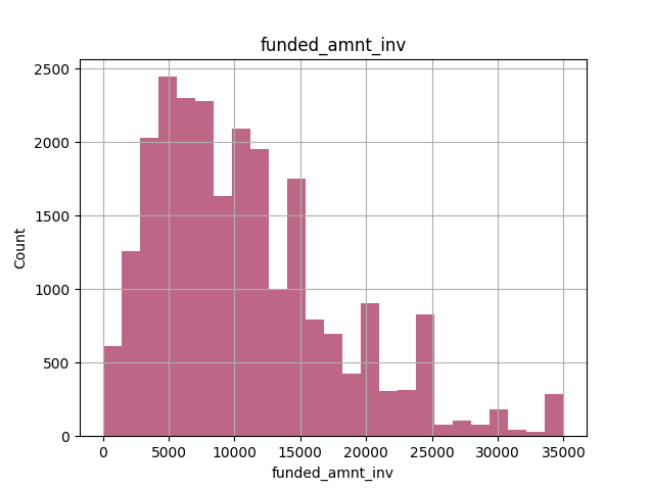


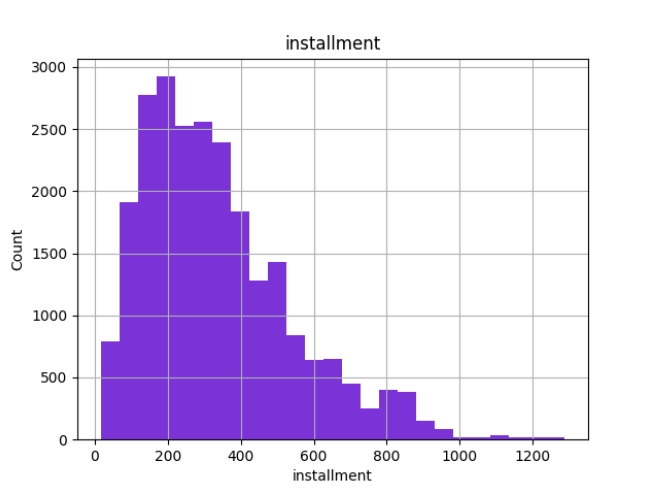


Univariate Analysis

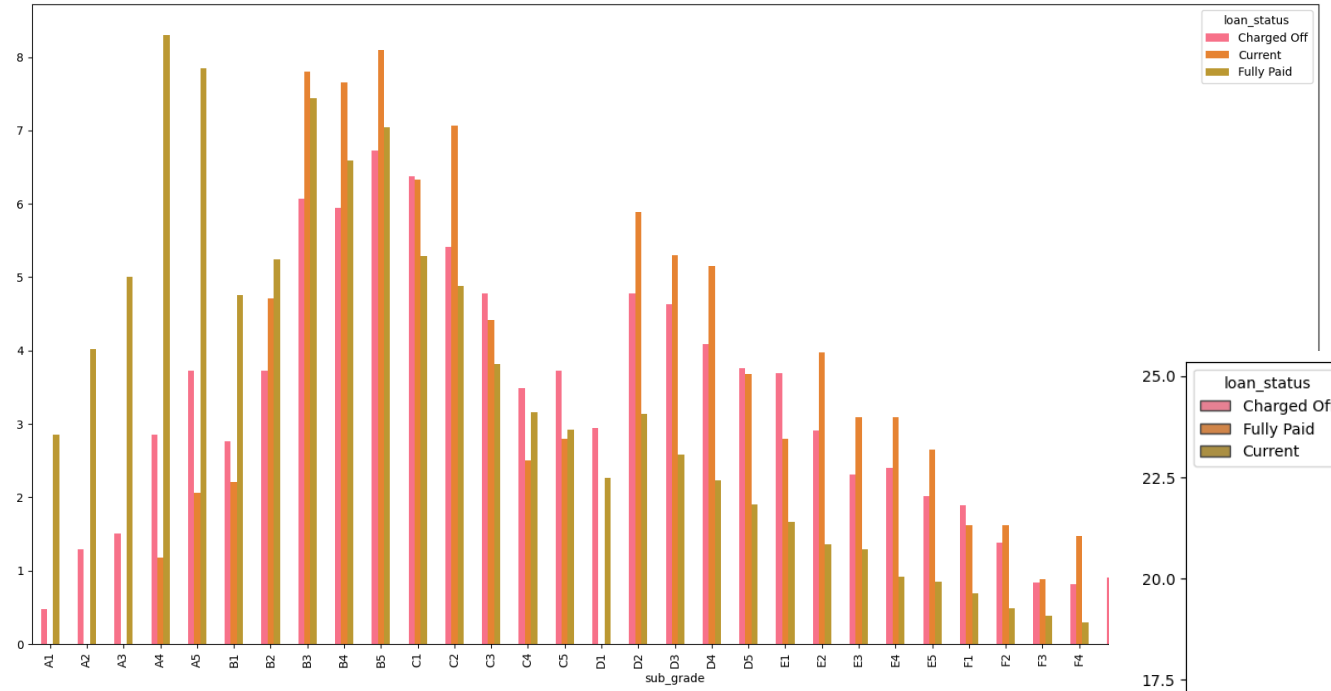


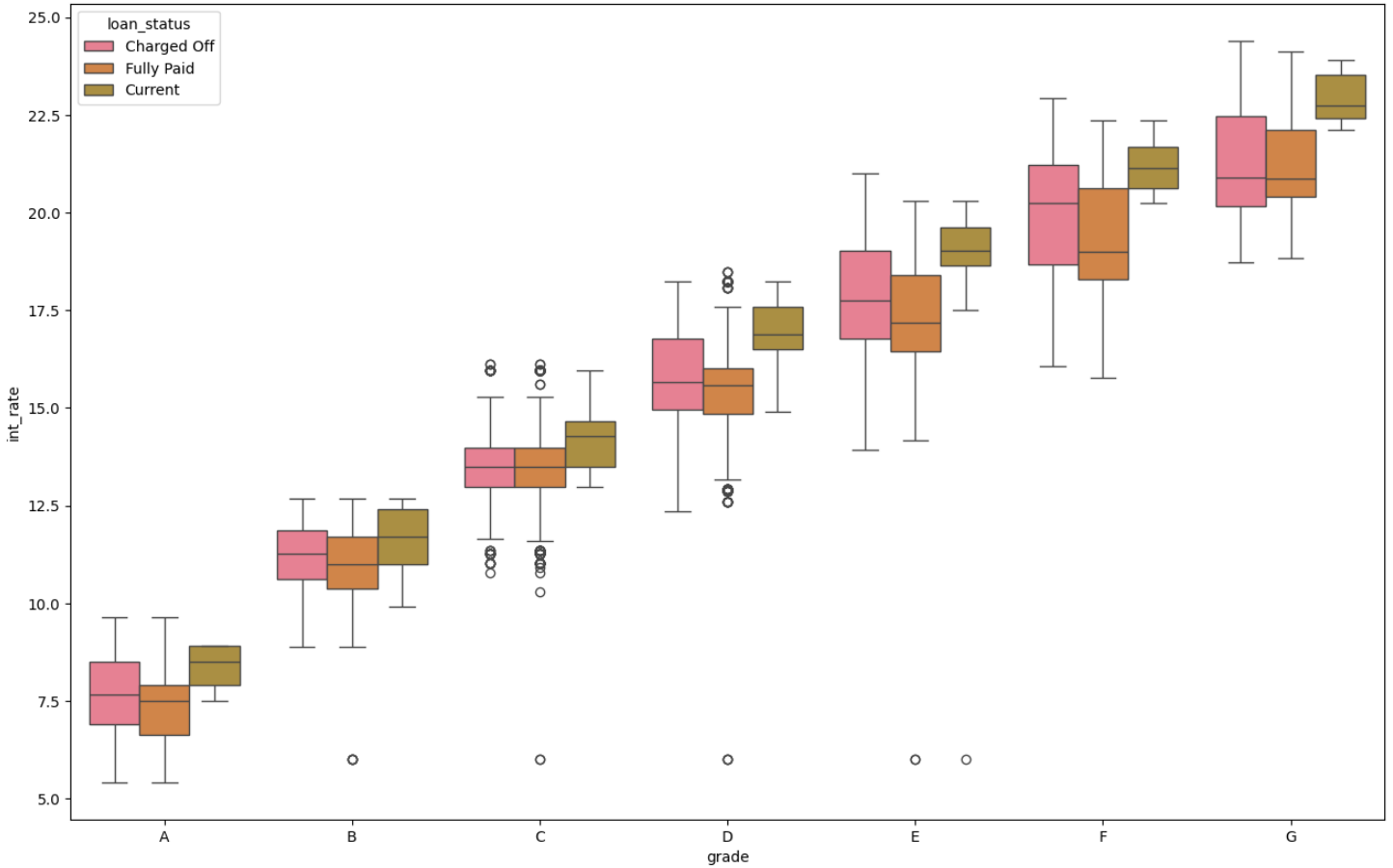


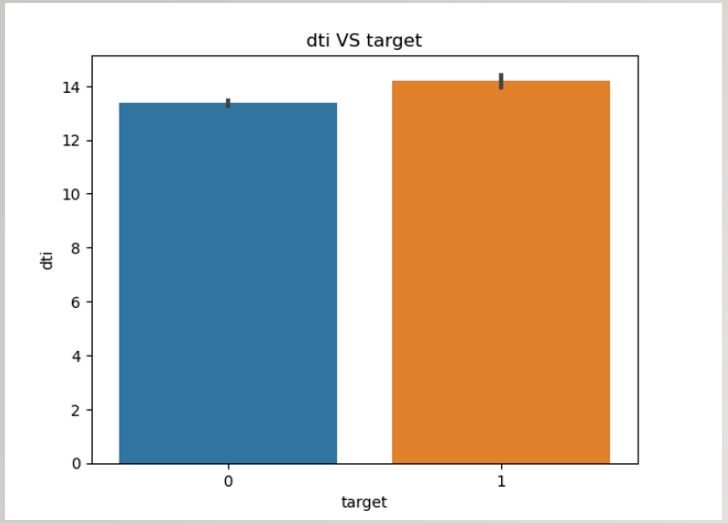


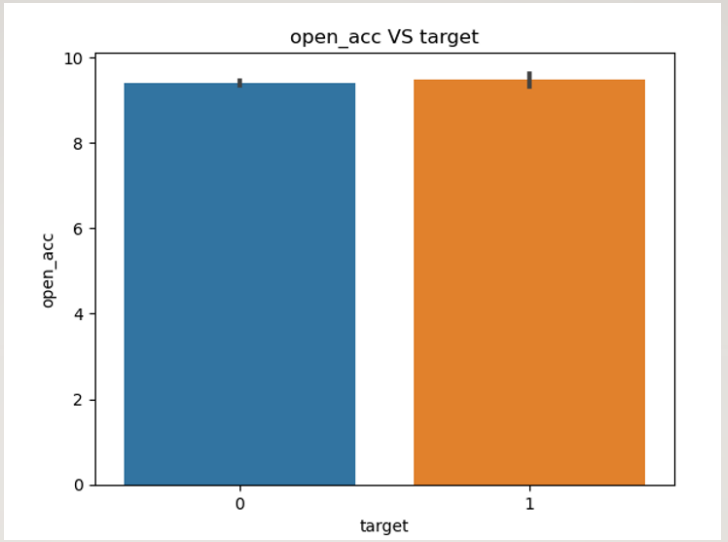


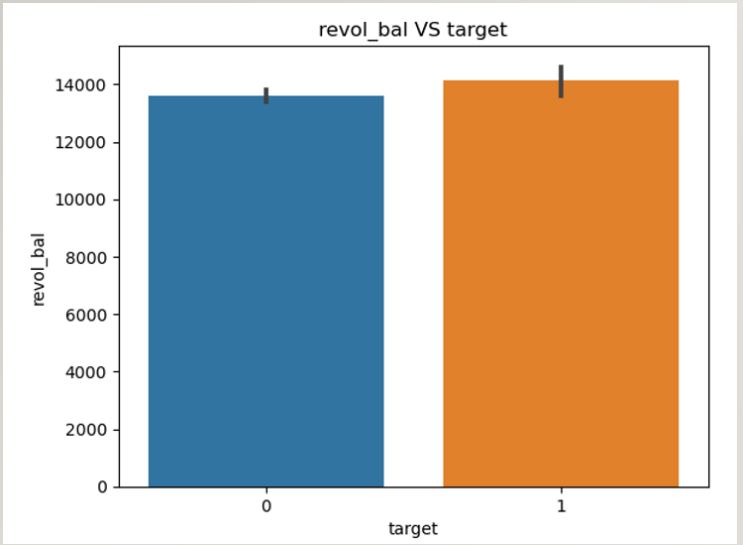
Bivariate Analysis

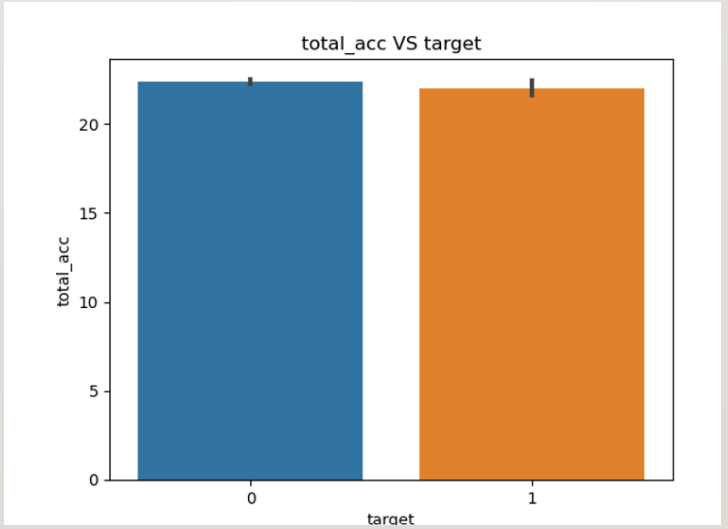


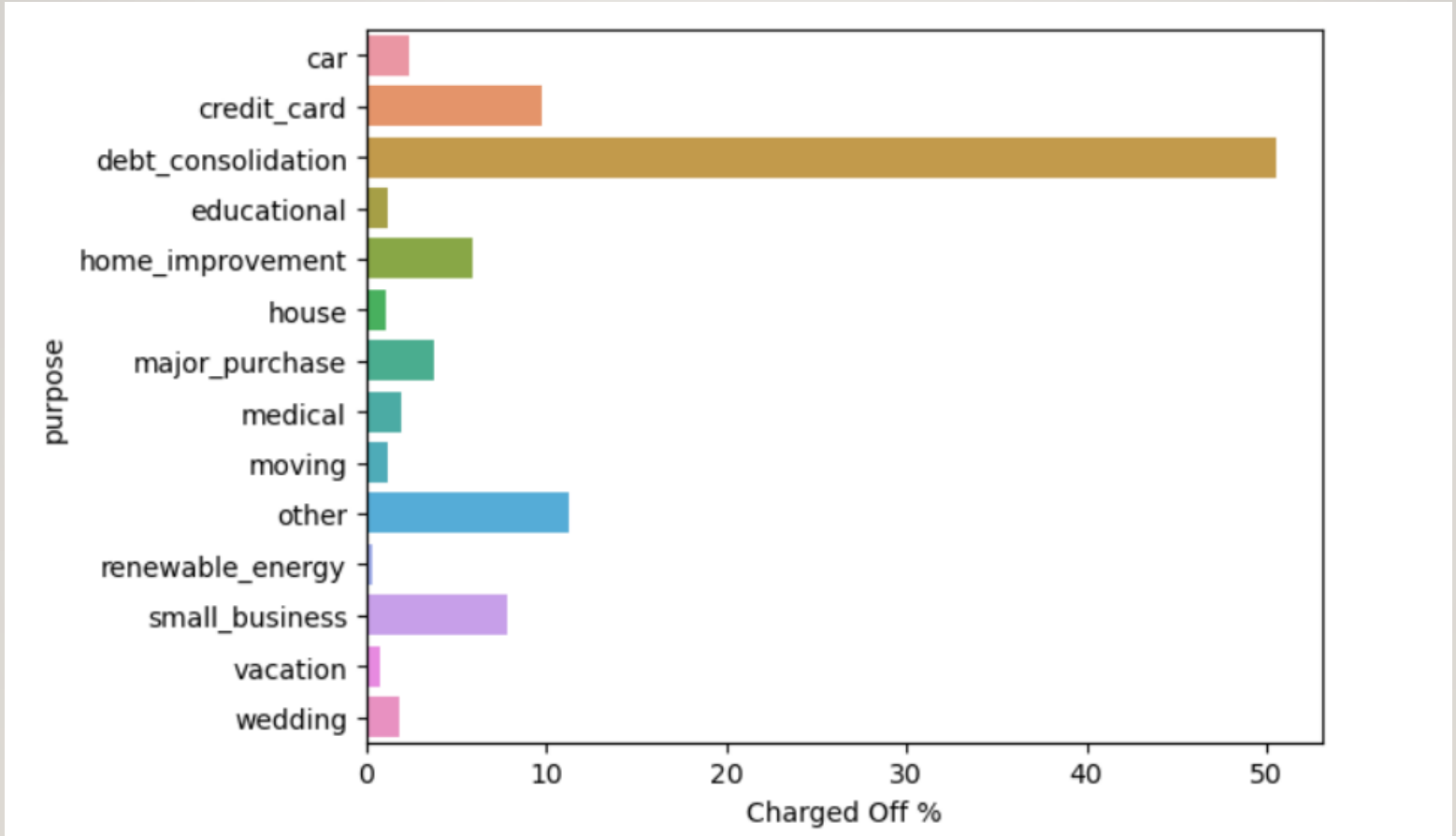



dti VS target
dti
target
0
1
0
2
4
6
8
10
12
14

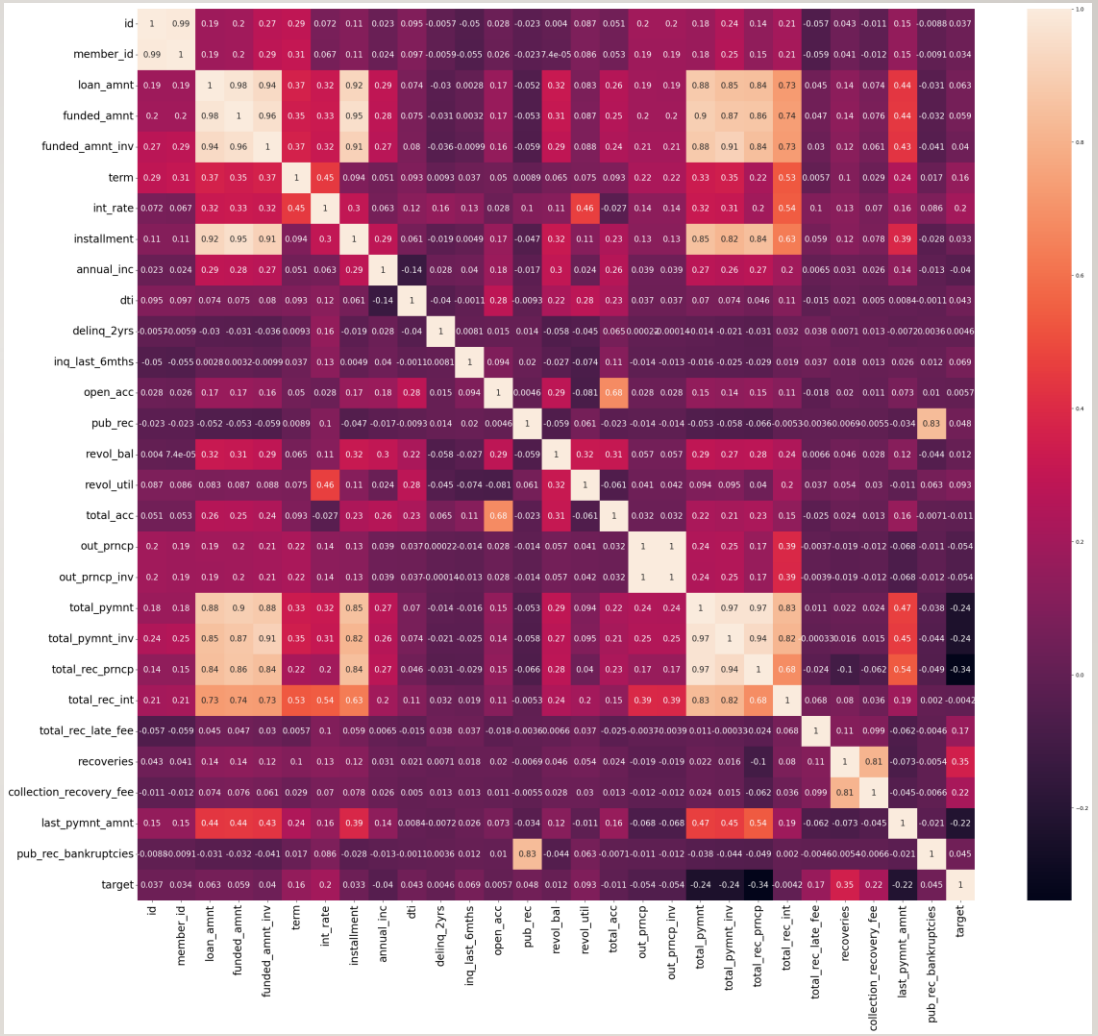

open_acc VS target
open_acc
target
0
1
0
2
4
6
8
10


revol_bal VS target
revol_bal
target
0
1
0
2000
4000
6000
8000
10000
12000
14000


total_acc VS target
total_acc
target
0
1
0
5
10
15
20


car
credit_card
debt_consolidation
educational
home_improvement
house
major_purchase
medical
moving
other
renewable_energy
small_business
vacation
wedding
purpose
0
10
20
30
40
50
Charged Off %

Cluster Map


id
member_id
loan_amnt
funded_amnt
funded_amnt_inv
term
int_rate
installment
annual_inc
dti
delinq_2yrs
inq_last_6mths
open_acc
pub_rec
revol_bal
revol_util
total_acc
out_prncp
out_prncp_inv
total_pymnt
total_pymnt_inv
total_rec_prncp
total_rec_int
total_rec_late_fee
recoveries
collection_recovery_fee
last_pymnt_amnt
pub_rec_bankruptcies
target

IMPORTANT OBSERVATIONS FROM THE EDA

- NO major differentiation seen in interest rates with income segment however, as income segment increases interest rates increases very slightly
- As grade changes from A to B and finally to F interest rates significantly increases. This means F are more risky customers as compares to A
- We can observe that the month May has more defaulted values compared to other in last_credit_pull_d months.
- Median incomes of all three categories of customers are nearly similar. However, many Fully Paid customers have higher income levels than charged off and current customers.
- People take Higher Loan amount for long term loans and vice versa i.e. Higher loan amount in 60 months loan tenure

- Median incomes of all three categories of customers are nearly similar with increasing trend from fully paid to charged off and current customers. However, Many Fully Paid customers have higher installments than charged off and current customers.
- Almost 49% loan are charged off when taken for the purpose of debt consolidation which is very high

- As income segment increases installment also increases

Key Takeaway:

From the above heatmap we can observe that the columns ***term****,* ***int_rate****,* ***revol_util*** *has* ***positive correlation*** *with the target column and* ***total_payment, total_payment_inv, total_rec_prncp, total_rec_late_fee, recoveries, collection_recovery_fee*** *and* ***last_payment_amount*** *has* ***negative correlation*** *with the target column.*

And we also observe that columns loan_amnt, funded_amnt, funded_amnt_inv, total_payment, total_payment_inv, total_rec_prncp, total_rec_int has high correlation among them self.

Detailed Analysis with code, corresponding results and important Deductions can be found in the .ipynb file.