

UpGrad's LENDING CLUB CASE STUDY



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Summary

- ▶ Exploring Data & Data manipulation.
- ▶ Exploratory Data Analysis (EDA).
- ▶ Observations
- ▶ Conclusion.



Exploring Data & Data Manipulation.

Data Overview: -

]:

	id	member_id	loan_amnt	funded_amnt	funded_amnt_inv	term	int_rate	installment	grade	sub_grade	...	num_tl_90g_dpd_24m	num_tl_op_past_1
0	1077501	1296599	5000	5000	4975.0	36 months	10.65%	162.87	B	B2	...	NaN	
1	1077430	1314167	2500	2500	2500.0	60 months	15.27%	59.83	C	C4	...	NaN	
2	1077175	1313524	2400	2400	2400.0	36 months	15.96%	84.33	C	C5	...	NaN	
3	1076863	1277178	10000	10000	10000.0	36 months	13.49%	339.31	C	C1	...	NaN	
4	1075358	1311748	3000	3000	3000.0	60 months	12.69%	67.79	B	B5	...	NaN	

Data shape: (Rows = 39717, Columns = 111)

Dropping Columns & Imputing missing Values:

Some of Dropped Columns with more than 30% of the missing values.

```
"id"  
"funded amnt" "grade"  
"emp_title"  
"pymnt_plan" "desc"  
"zip_code" "open_acc"  
'initial_list_status "  
"out_prncp_inv"  
"member_id"  
"funded_amnt_inv"  
"sub_grade" "issue_d" "url"  
"title" "addr_state"  
"revol_bal" "out_prncp"
```

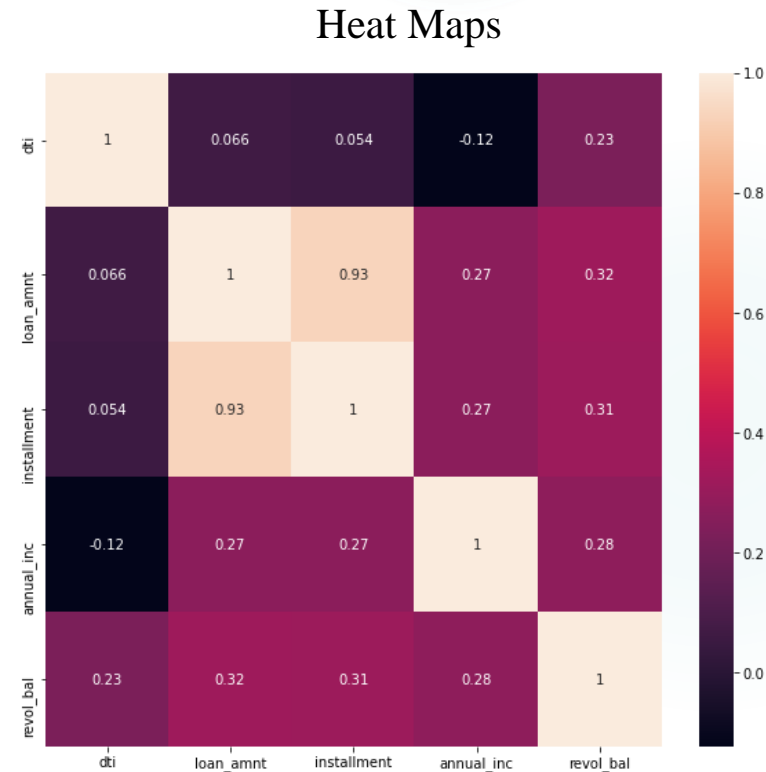
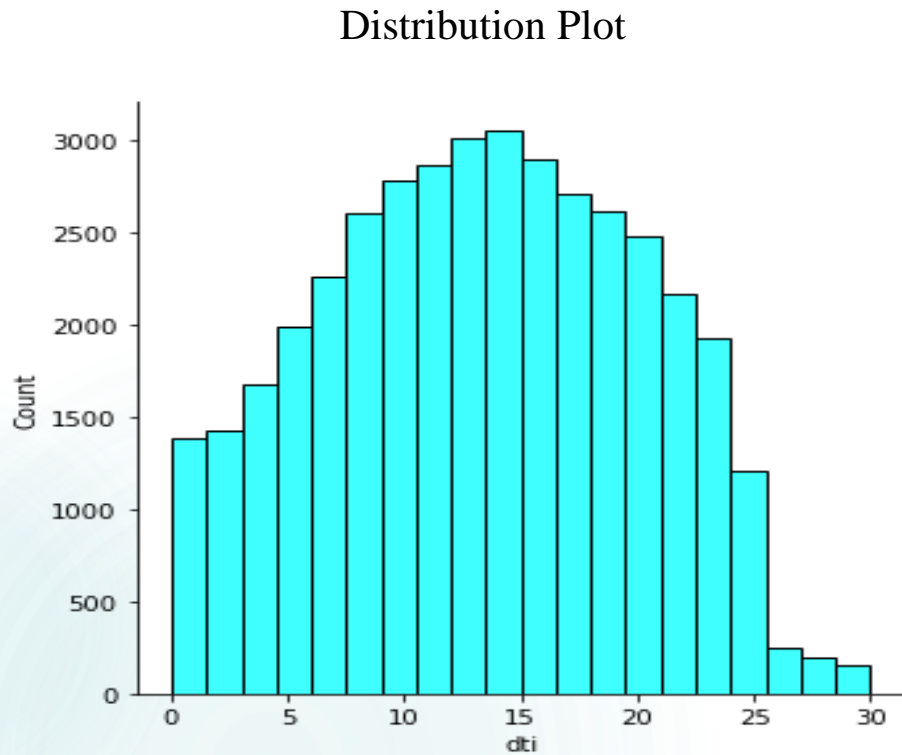
Some of the Columns Imputed for Missing Values and important for analysis

```
'loan_amt'  
'int_rate'  
'emp_length'  
'home_ownership'  
'verification_status'  
'purpose'  
'delinq_2yrs'  
'term'  
'installment'  
'total_acc'  
'loan_status'  
'dti'  
'inq_last_6mths'
```



Exploratory Data Analysis (EDA)

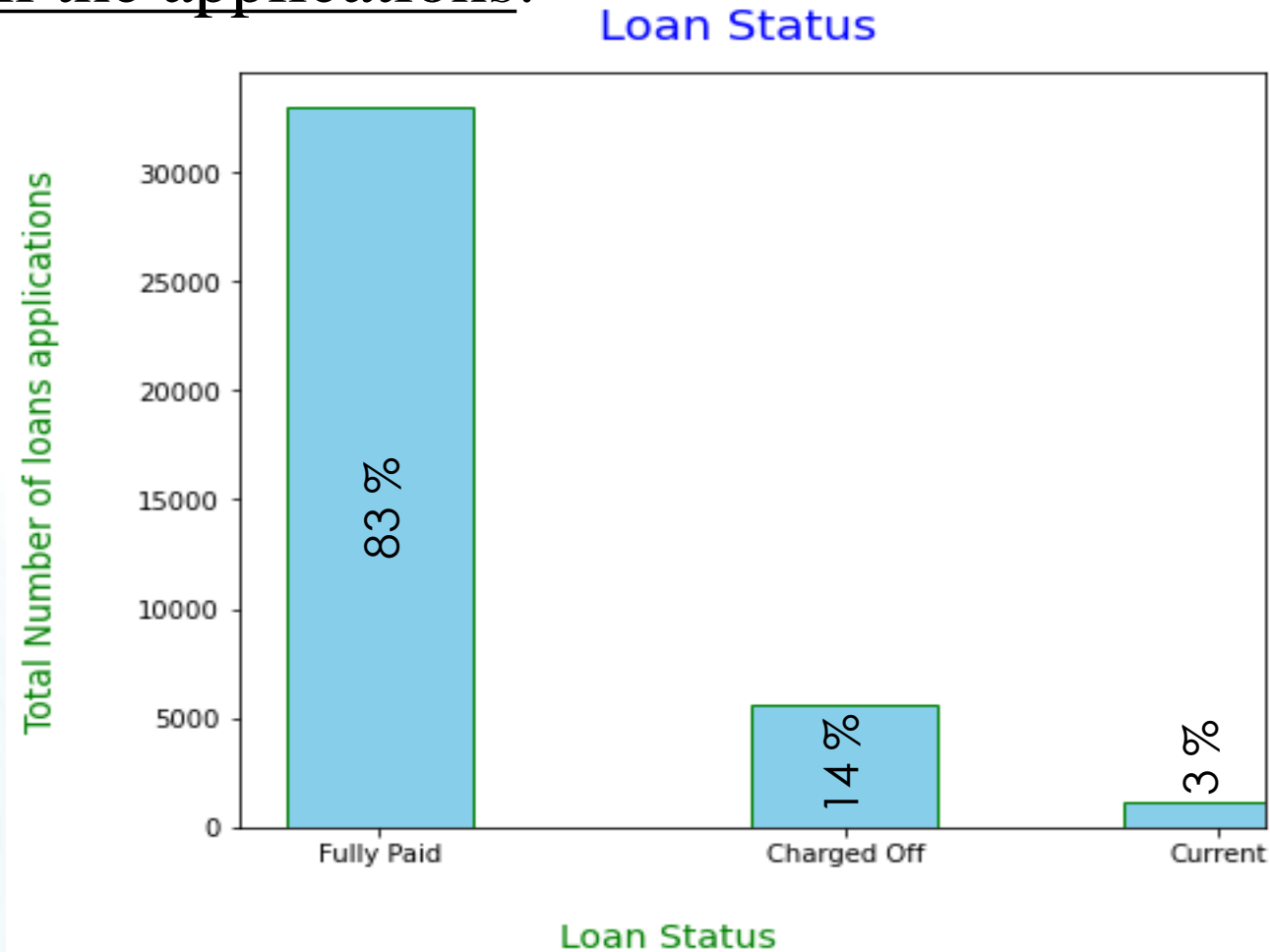
Exploring debt to income ratio (dti):-



Observations:-

- It is clear from the Distribution plot, Most of the loan application in the data frame have high 'dti' values.
- In the heatmaps dti doesn't show any strong correlation with loan amount, installments, annual income & revolving account.

Loan Status of All the applications:-



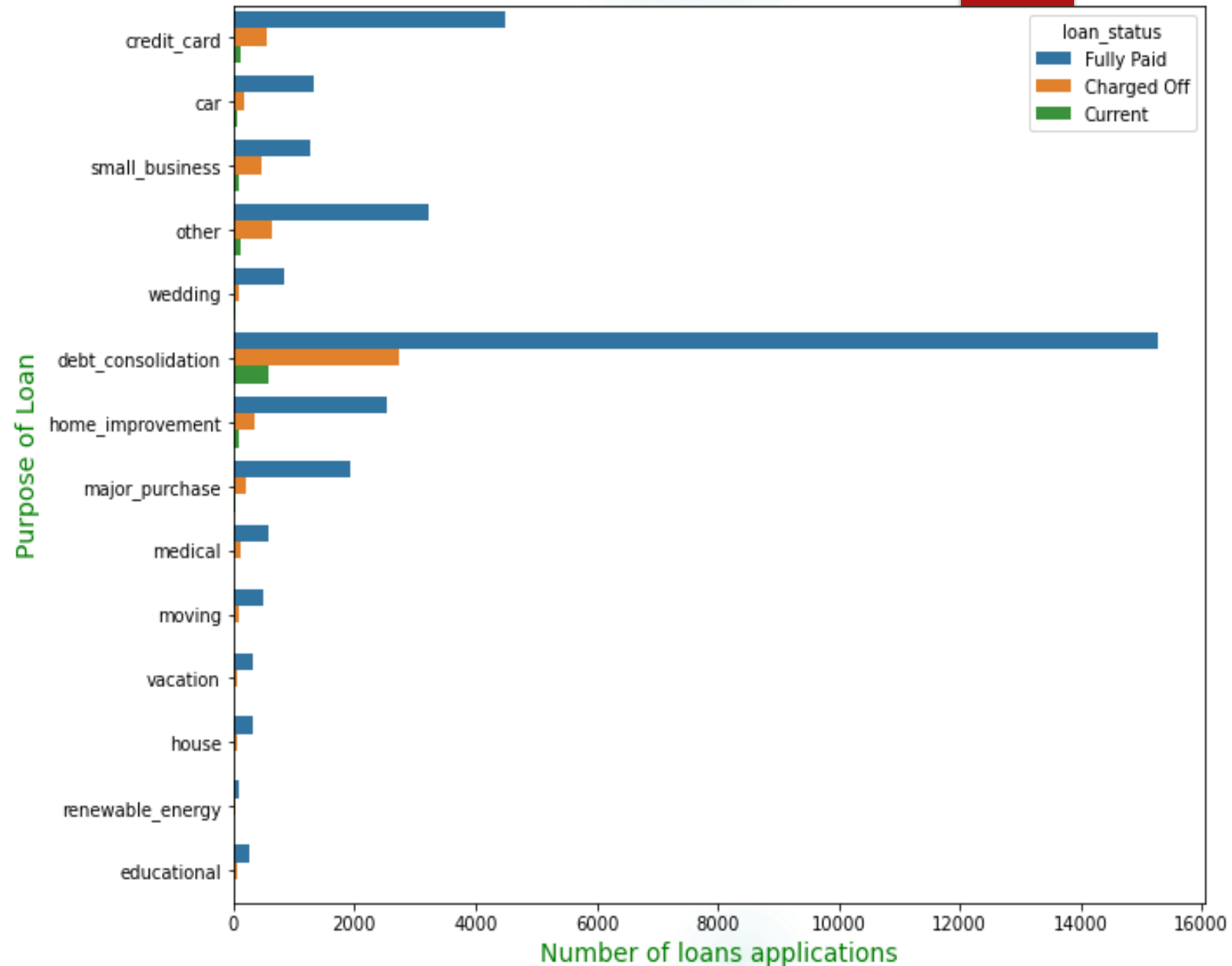
Observation :-

- Bar chart for Loan Status Shows that 83% loans are 'Fully Paid', 14% of the Loans are 'Charged off ' and remaining 3% of the loans are currently running.

Loan Status Vs Purpose of Loans:-

Observations:-

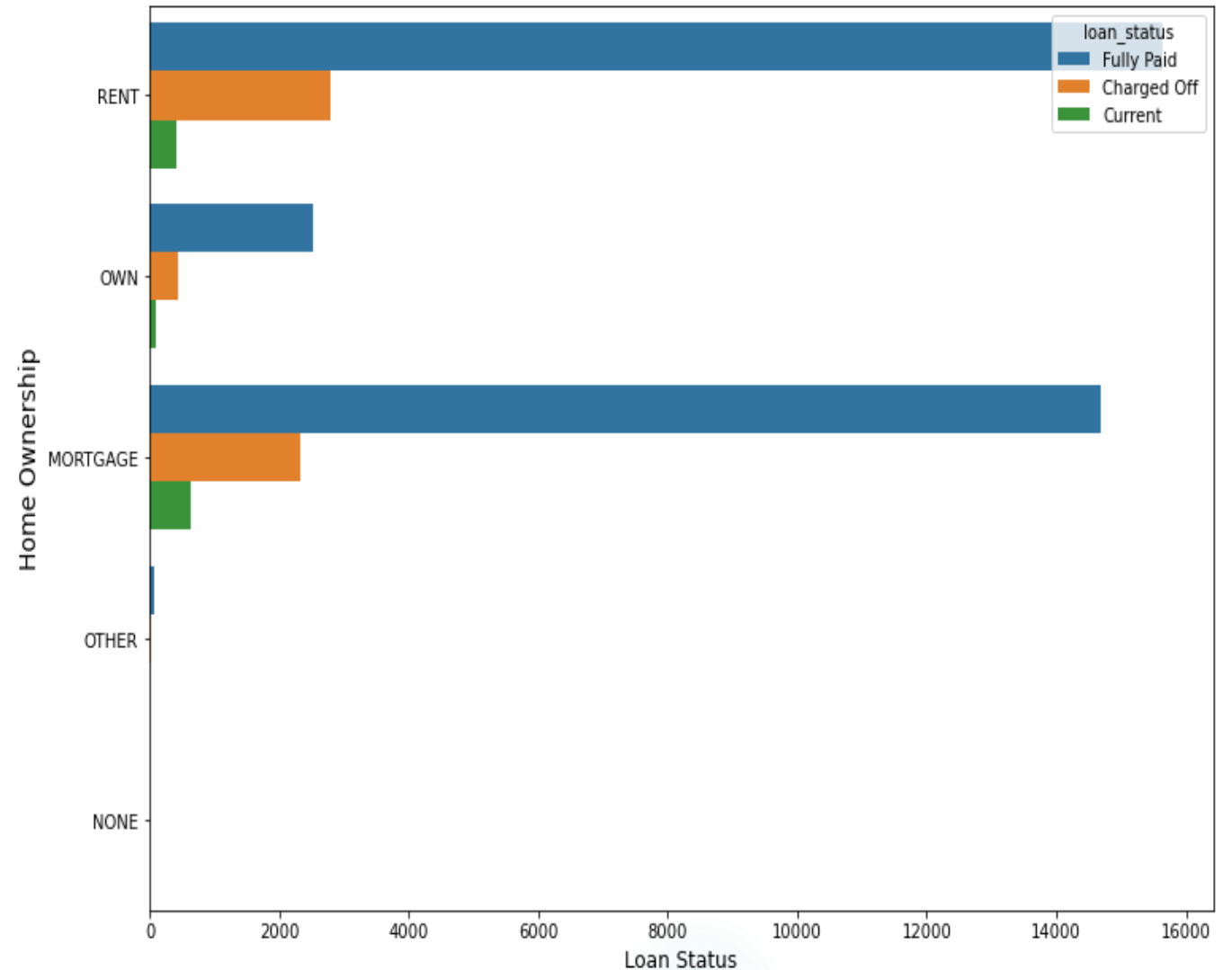
- From the merged bar plot of 'loan status' & Purpose of Loan. It is very clear, that the most applicants 'Charged off', have the purpose of loan as 'Debt Consolidation'
- Credit Card and small business loans have also high risk of being 'Charged off';



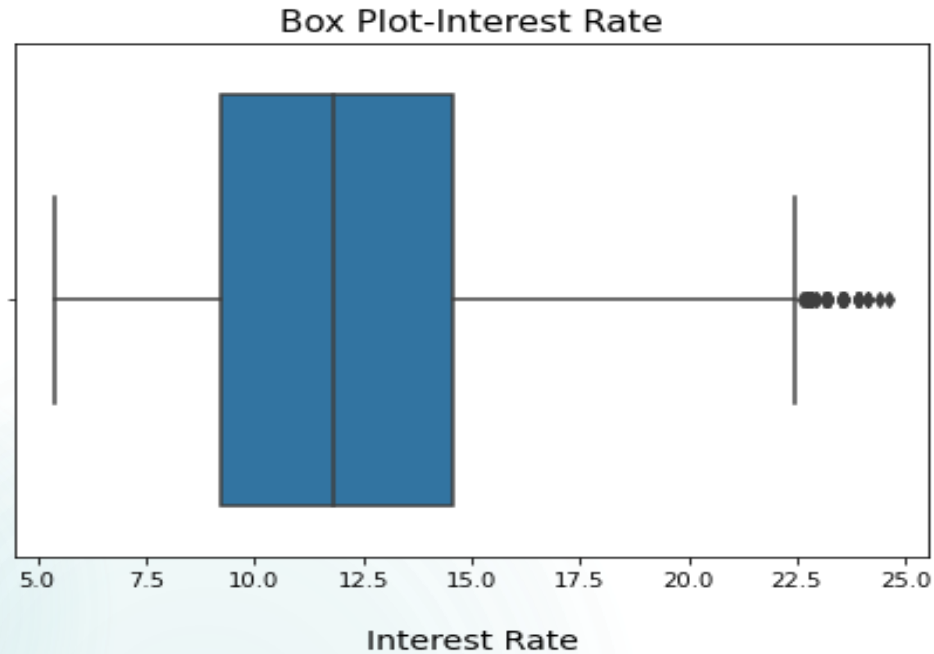
Home Ownership Vs Loan Status

Observations:-

- It is clear that applicant which has Rented ownership and Mortgage home are have high probability of being 'Charged off'.
- The applicants who has 'Own Home Ownership' are less likely to get 'Charged Off'

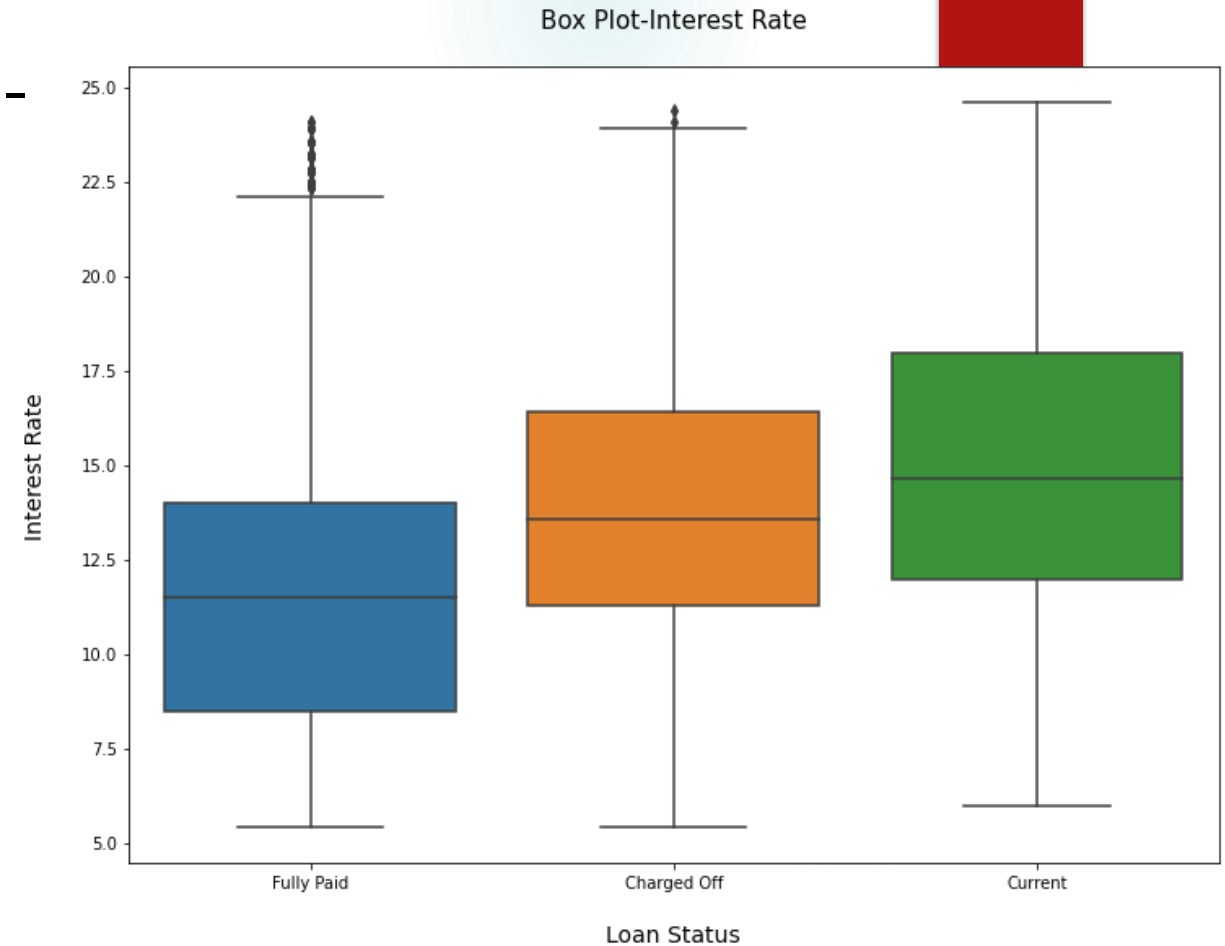


Univariate Analysis on Interest Rate:-

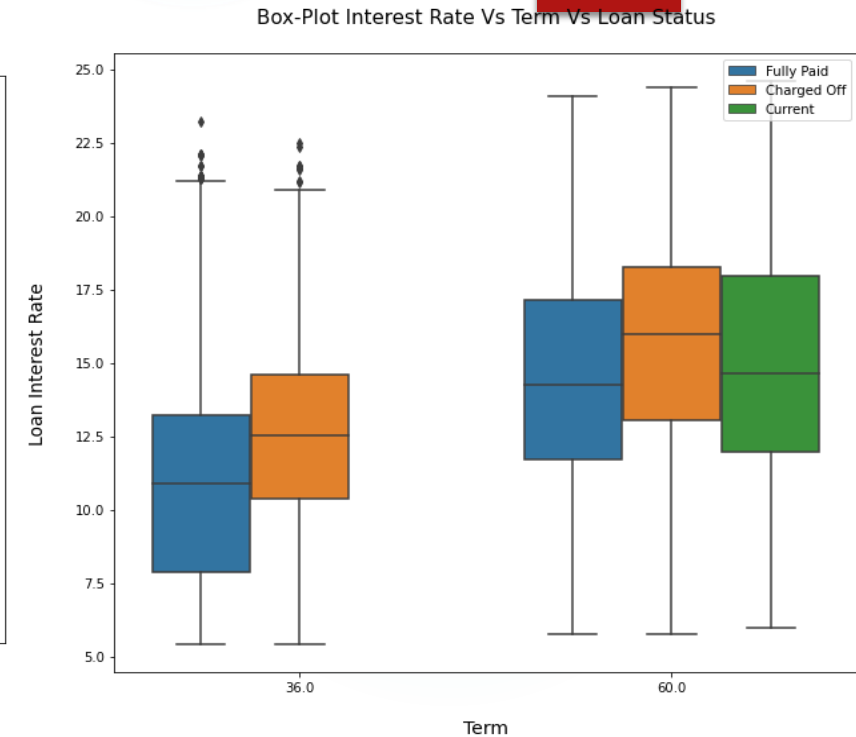
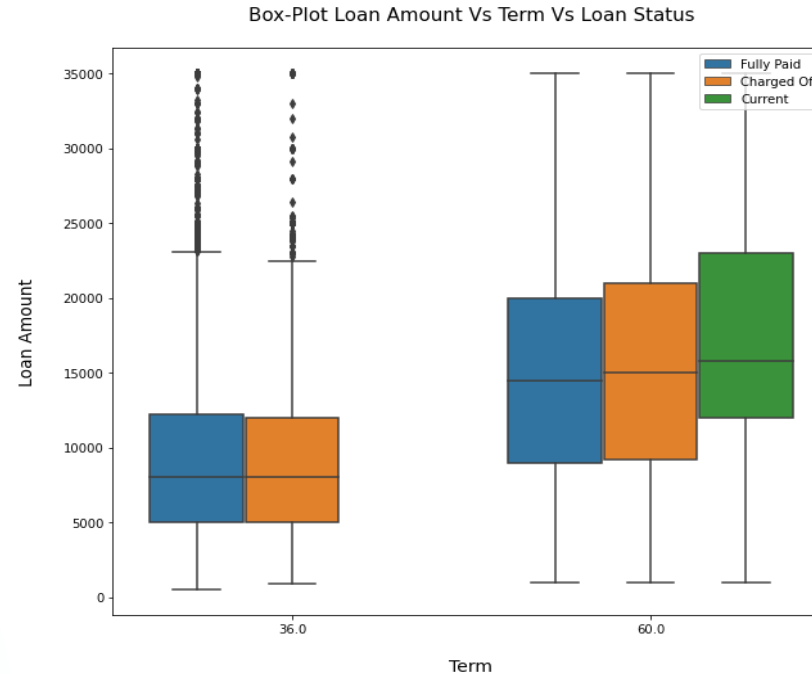
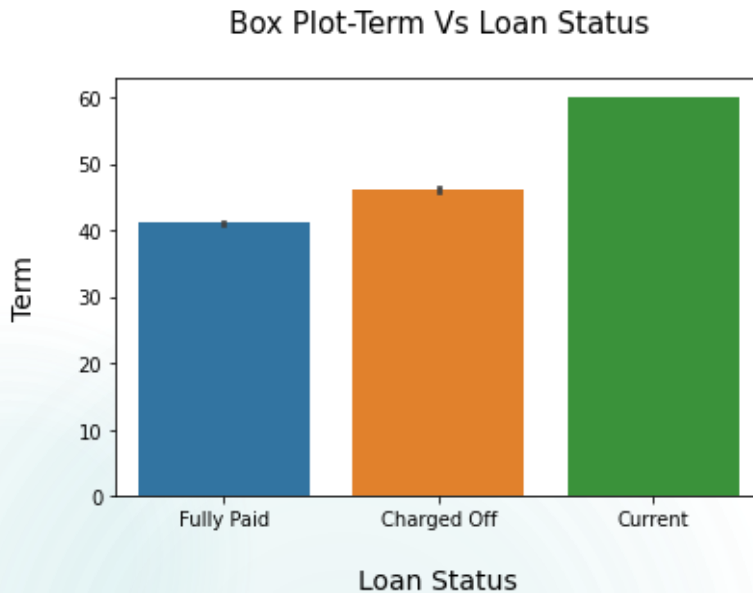


Observations:-

- It shows that most of the 'Interest Rate' for the applicant is between 10% to 15% (approx.)
- It shows that the most of the 'Charged Off' cases have higher 'Interest Rate', Whereas, 'Fully Paid' cases has lower Interest rate than.



Analysis on Loan Status with some variables



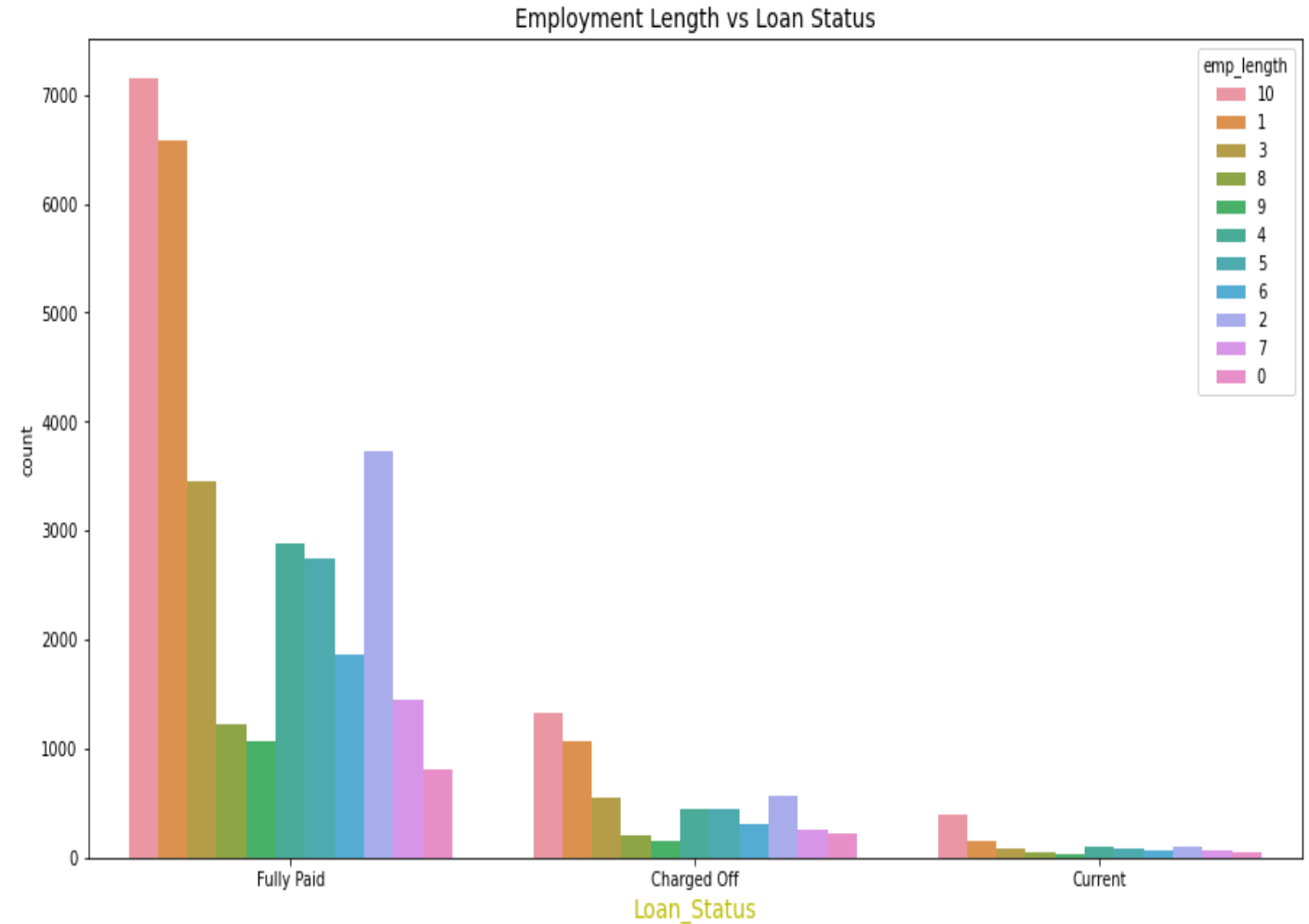
Observations:-

- The First concludes that the Charged Off cases have higher Term than fully paid.
- The 2nd plot shows that the cases that were 'Charged Off' have Higher Interest Rate with longer period of time.
- 3rd shows that 60 months loan term have higher Interest Rate which also has higher 'Charged Off' cases.

Employment length Vs Loan Status

Observations:-

- This plot shows that the applicants having no job are most likely to be ‘Charged Off’
- The applicants with one or less than one year of employment length are also more likely to be Charged off’.

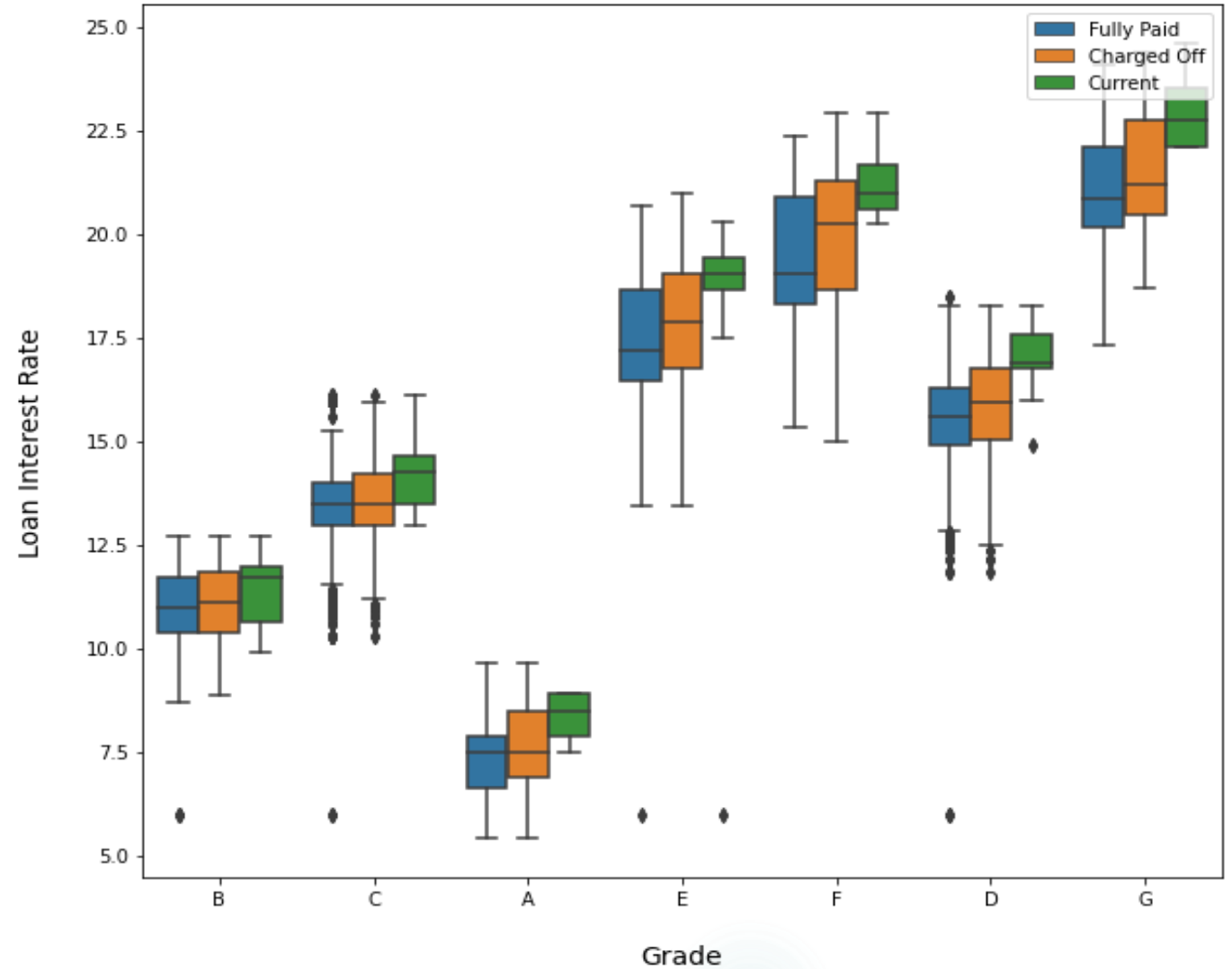


Interest Rate Vs Grade:-

Observations:-

- The Lower grades are getting loans for higher interest rates because 'E','F','G' are more likely to 'Charged Off'

Box-Plot Interest Rate Vs Grade Vs Loan Status



Conclusion

- ▶ The Lending Club should be carefully in giving loans to the applicants who has high 'dti'.
- ▶ The borrowers which have purpose of loan as 'Debt Consolidation', the lending club should not loans to them. Credit Card and small business loans have also high risk of being 'Charged off'.
- ▶ The applicants which has Rented ownership and Mortgage home have high probability of being 'Charged off', the lending club should avoid such cases. The applicants who has 'Own Home Ownership' are less likely to get 'Charged Off'.
- ▶ The Lending club should reduce the high interest loans for 60 months tenure, they are most likely to be Charged Off.
- ▶ The Lending club should avoid cases in which applicants who don't have jobs, these are most likely to be 'Charged Off'. The applicants with one or less than one year of employment length are also more likely to be Charged off'.