LENDING CLUB
CASE STUDY

Author
Preethi R
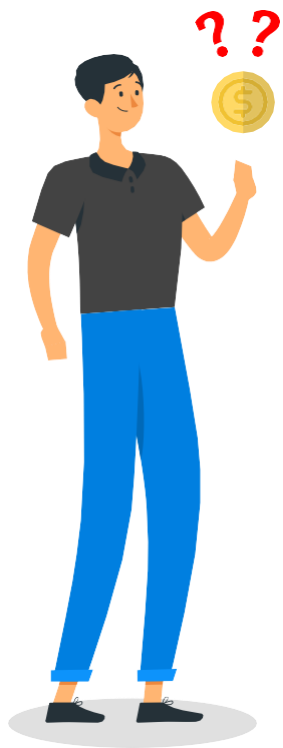**Abhinav Gupta**

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"A SMALL LOAN MAKES A DEBT ; A GREAT ONE MAKES AN ENEMY"

- *PUBLILIUS SYRUS*
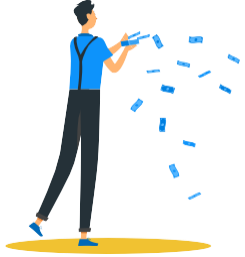
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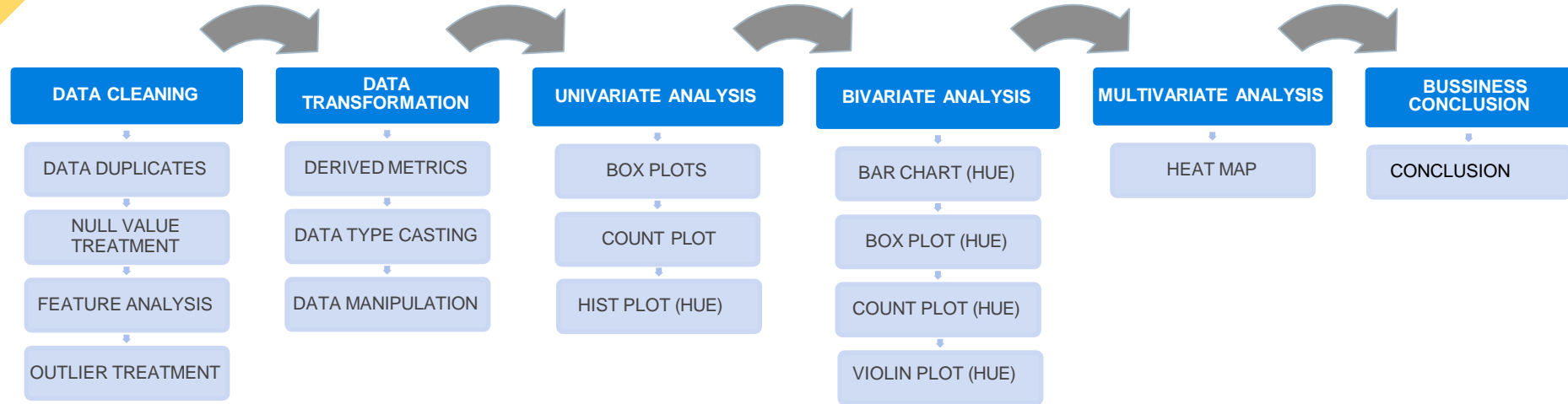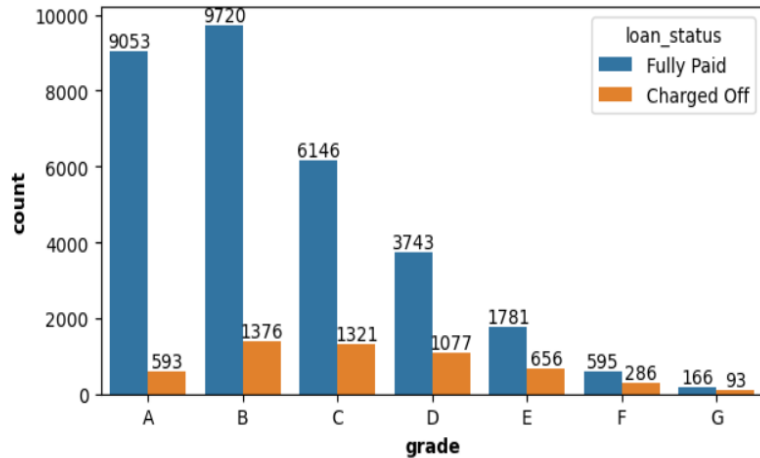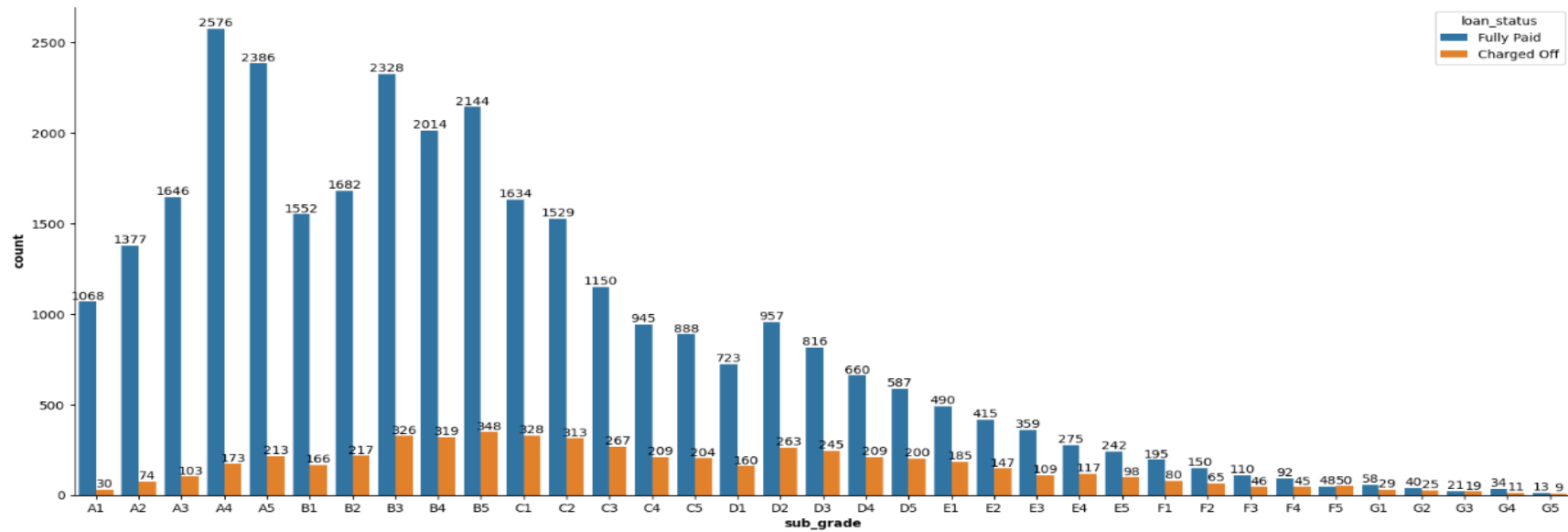**PROBLEM STATEMENT AND APPROACH.**

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⚖️ PROBLEM STATEMENT

STATEMENT

Lending a loan is risky decision that a company takes and the borrowers who default cause the largest amount of loss to the lenders, reduces lender's cash flow. Identifying those risky applicants helps in cutting down the amount of credit loss to the organization.

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APPROACH

DATA CLEANING	DATA TRANSFORMATION	UNIVARIATE ANALYSIS	BIVARIATE ANALYSIS	MULTIVARIATE ANALYSIS	BUSSINESS CONCLUSION
DATA DUPLICATES	DERIVED METRICS	BOX PLOTS	BAR CHART (HUE)	HEAT MAP	CONCLUSION
NULL VALUE TREATMENT	DATA TYPE CASTING	COUNT PLOT	BOX PLOT (HUE)		
FEATURE ANALYSIS	DATA MANIPULATION	HIST PLOT (HUE)	COUNT PLOT (HUE)		
OUTLIER TREATMENT			VIOLIN PLOT (HUE)		

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INFERENCE: (LC assigned Loan Grade & Subgrade verses Defaulters)

- Grade A,B,C, are comparatively less defaulted compared to grade E, F, D, G
- Percentage of defaulters are more than 40% for Sub grades like G5,G3, F5.

Loan Purpose wise Defaulters / Loan Purpose wise Applicants
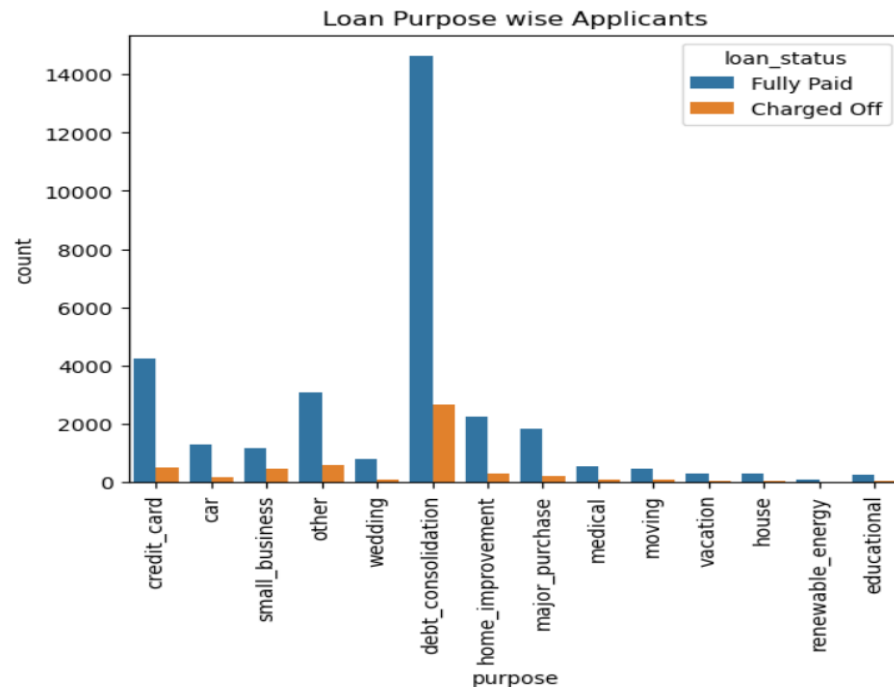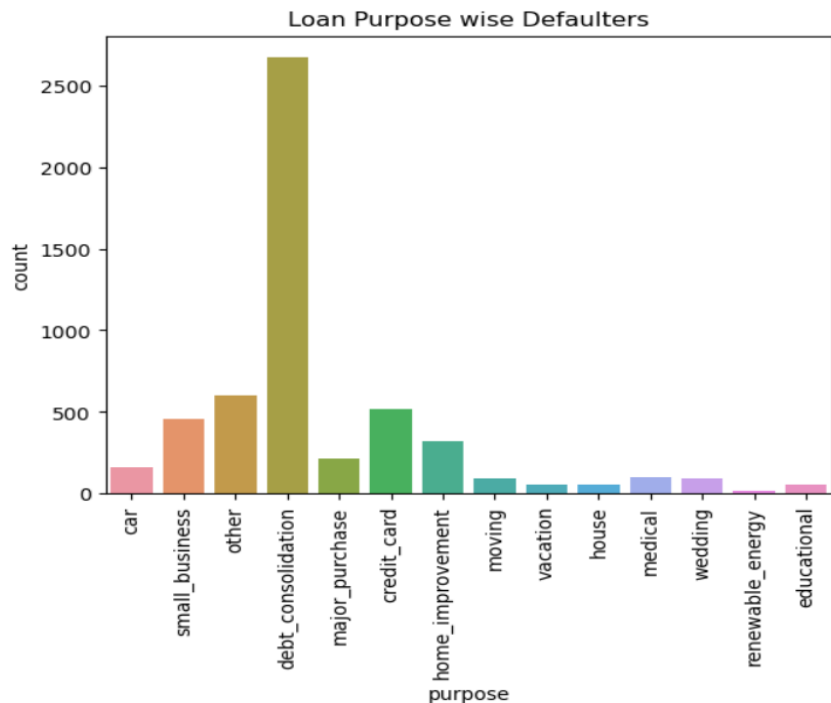
INFERENCE: (Loan Purpose verses Defaulters)
- Most of the Loan Applicants are for Debt Consolidation followed by Credit Card and the Defaulters are also more for Debt Consolidation & Credit Card.
- Small Business has 27% of Defaulters.

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	term	loan_status	%
0	36 months	**Charged Off**	11.20
		Fully Paid	88.80
1	60 months	**Charged Off**	25.77
		Fully Paid	74.23

Loan Term wise Applicants

INFERENCE: (Loan Term verses Defaulters)

- Loan defaults in 60 month term are more. For 60 Month the default rate is 25% while in 36 month it is 11%.
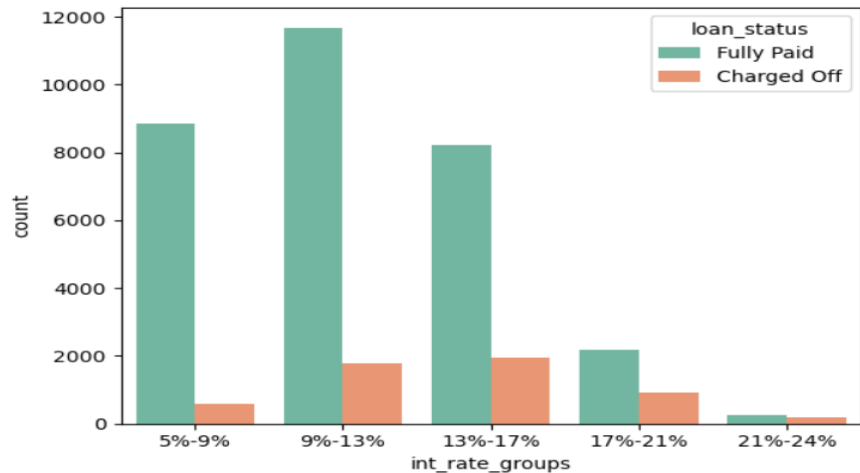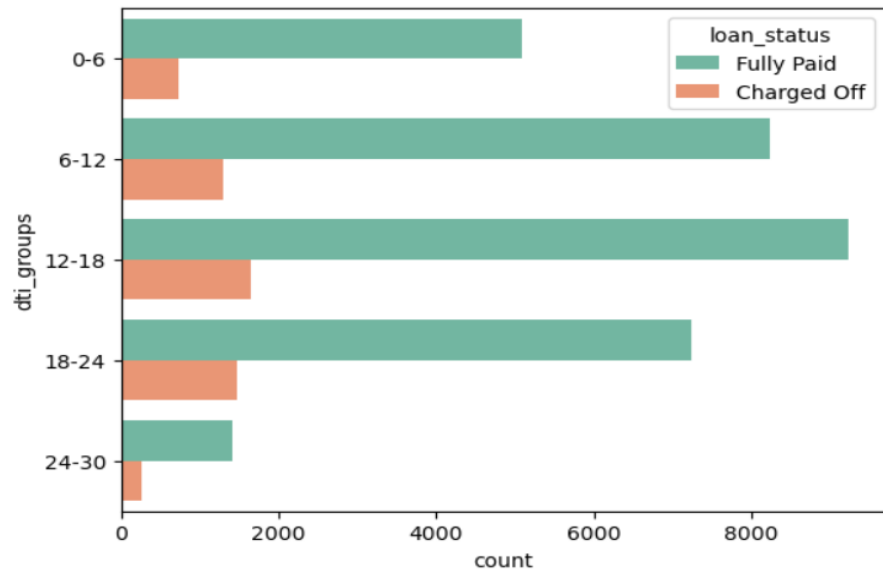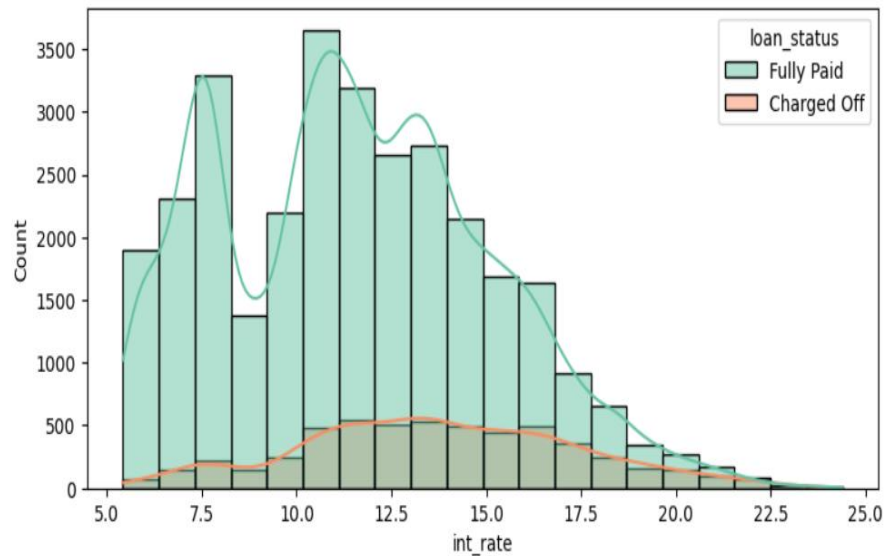- We can say the longer loan term have a high chance of defaulters.

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Employment Lenght wise Defaulters

Employment Lenght wise Applicants
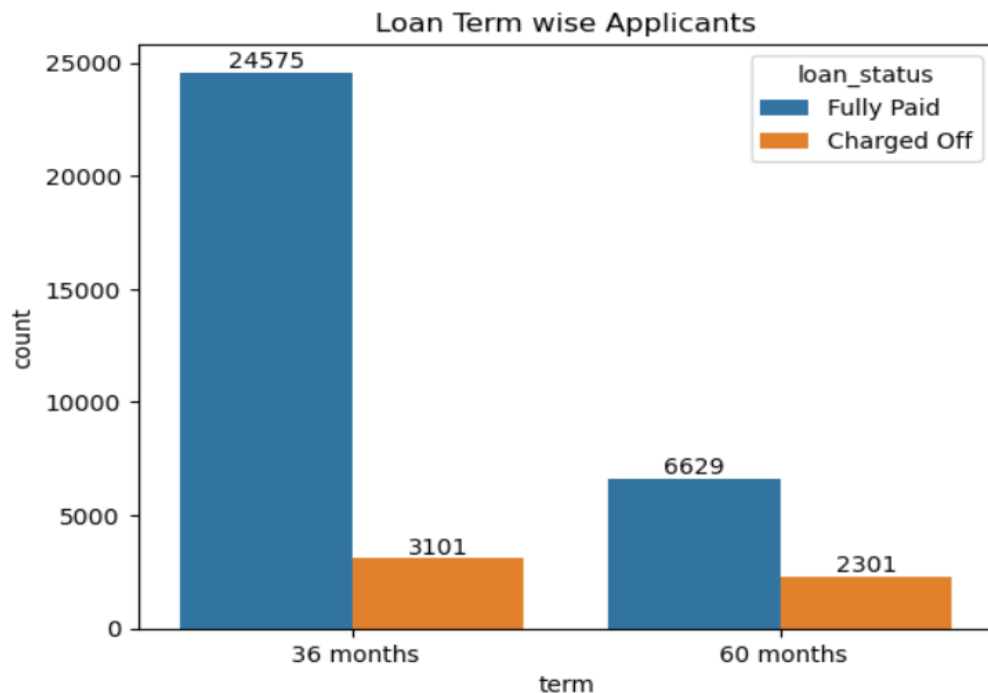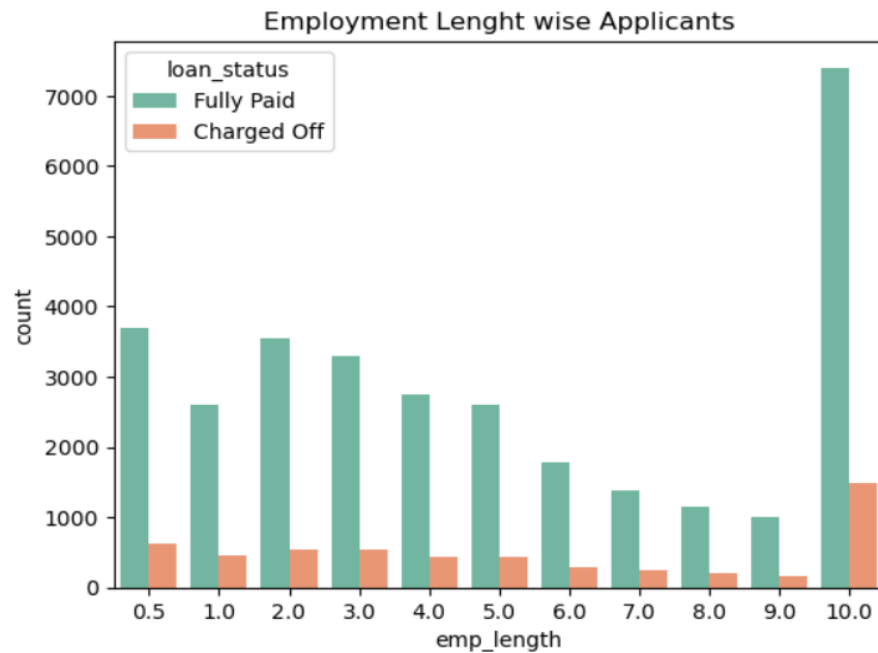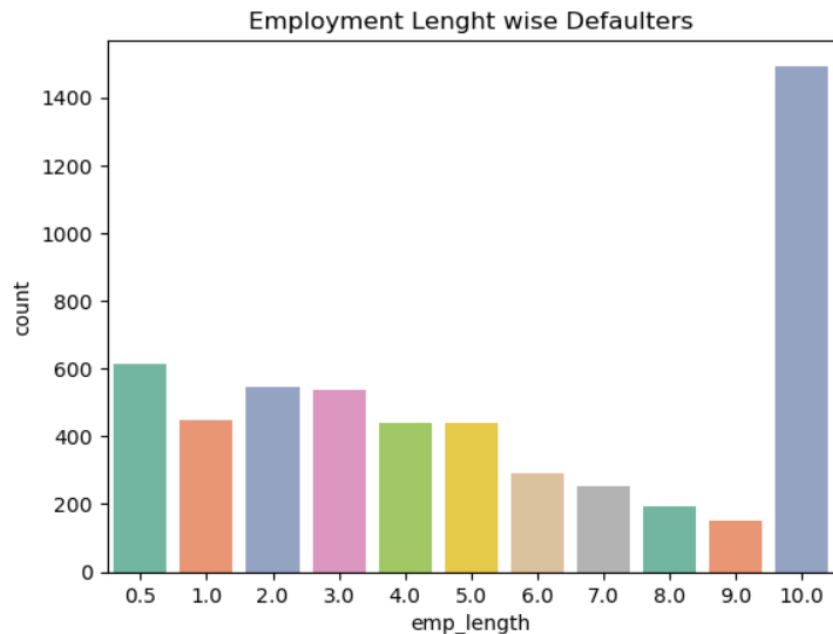
INFERENCE :

- Loan Applicants having 10+ years of experience are the highest in Count. Also the Defaulters are higher for 10+ years of employment length.
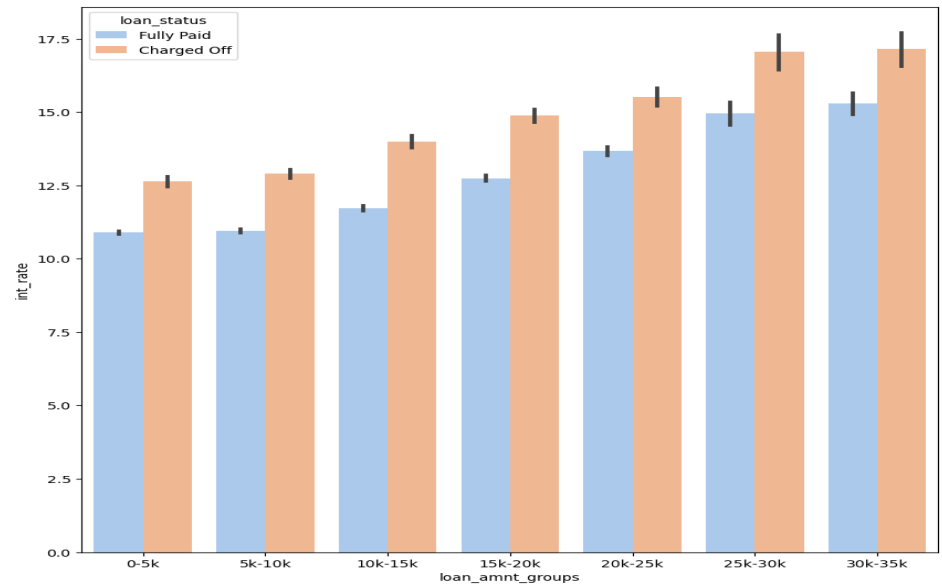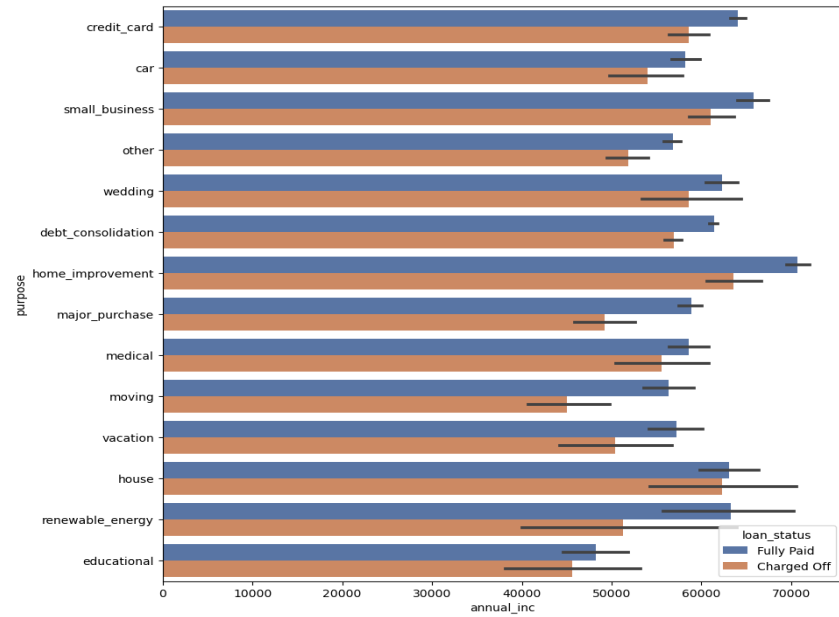
INFERENCE : DTI & Interest

- The Defaulters % are increasing with higher interest rates. The count of defaulters are highest between 12 to 17 % interest rate.

- Also higher DTI ratio leads to higher defaulters percentage.
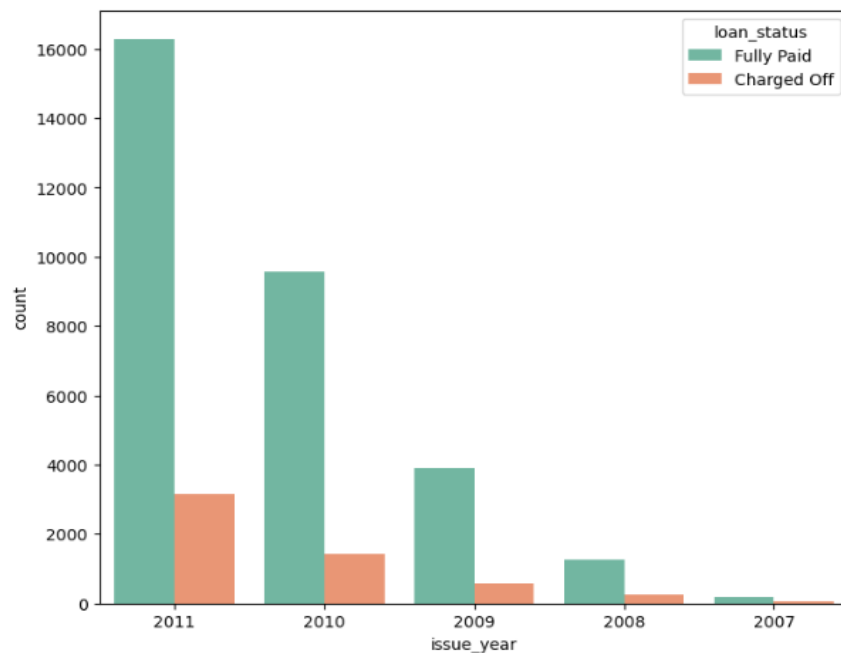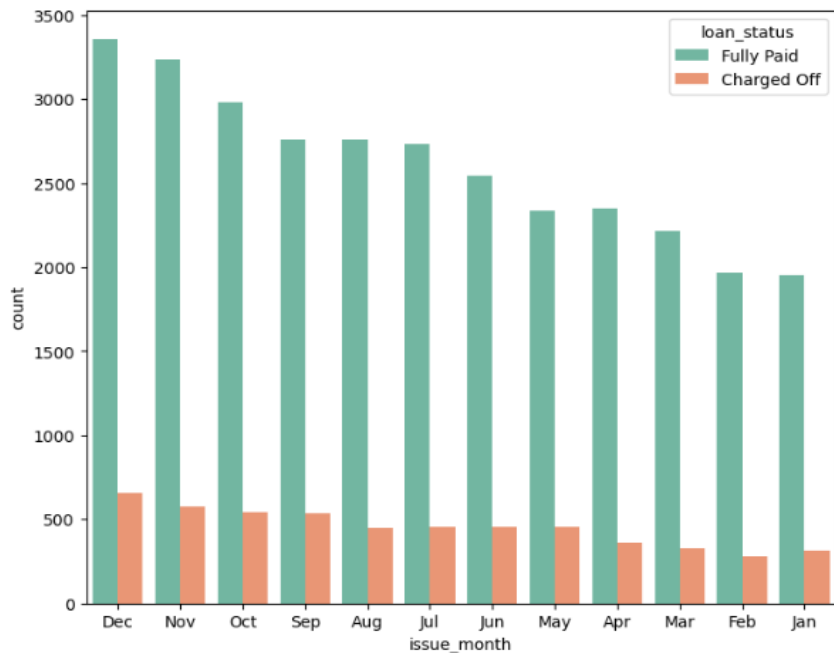
INFERENCE :

- The number of loans approved by LC are increasing over year.
- The last quarter of the year especially in December month there are more applicants for loan and similarly the Defaults are also more in dec & may month.
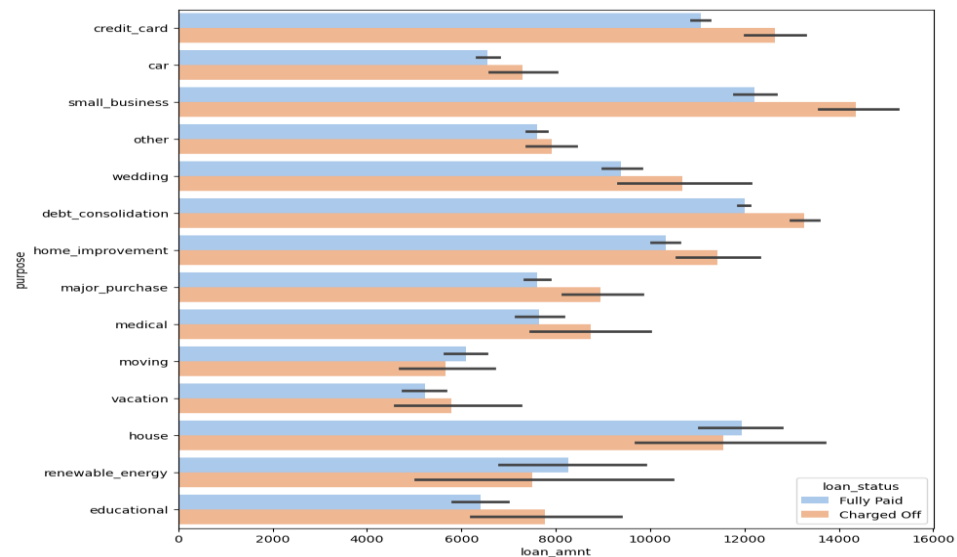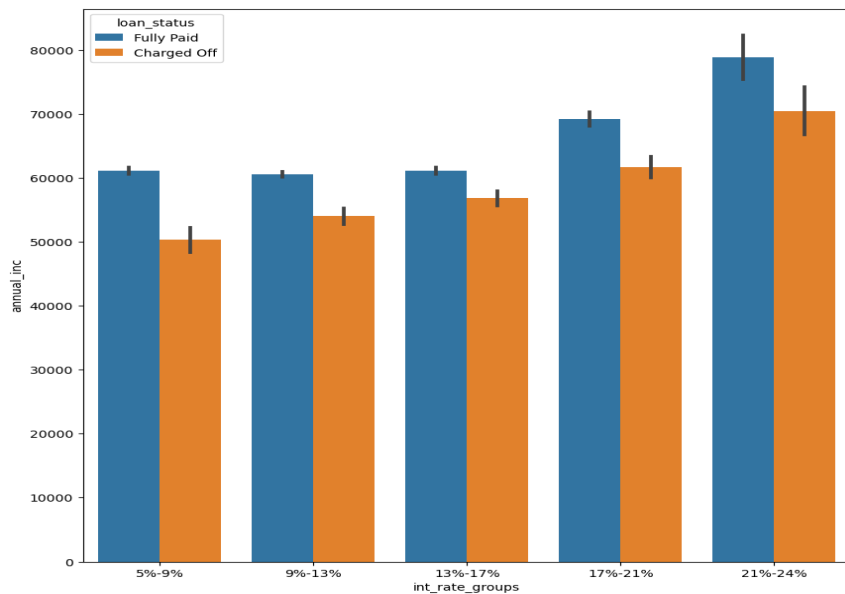
INFERENCE :

- Loan for debt consolidation, credit card, small business with average loan amount greater than 12000 are more likely to default.
- Loan provided for house, debt consolidation, small business with highest interest rate are more likely to charge off.
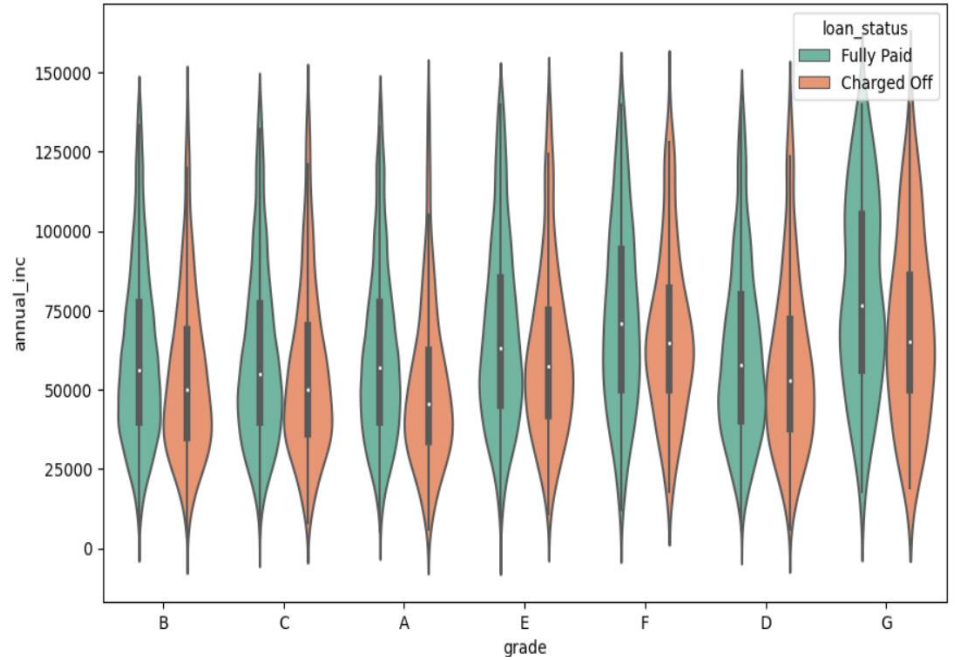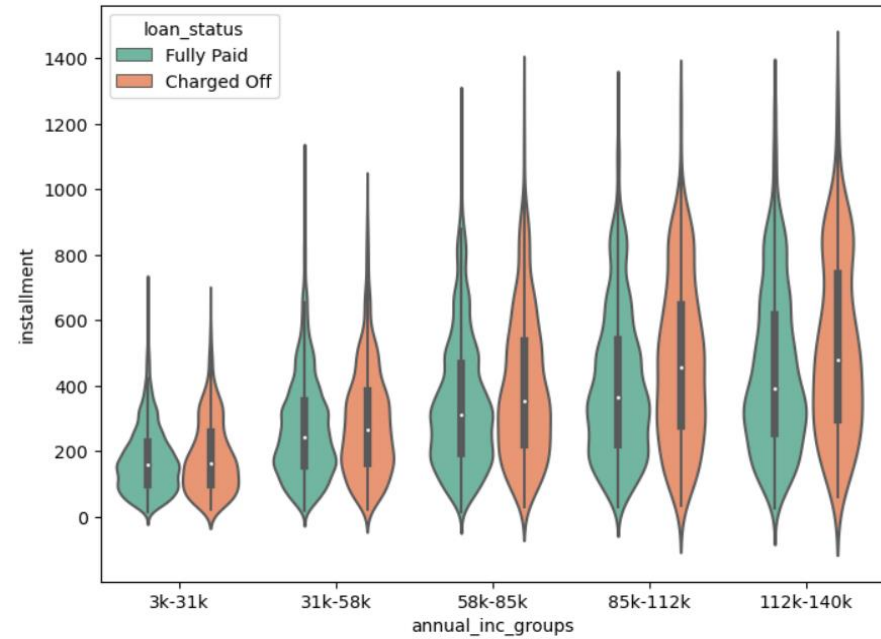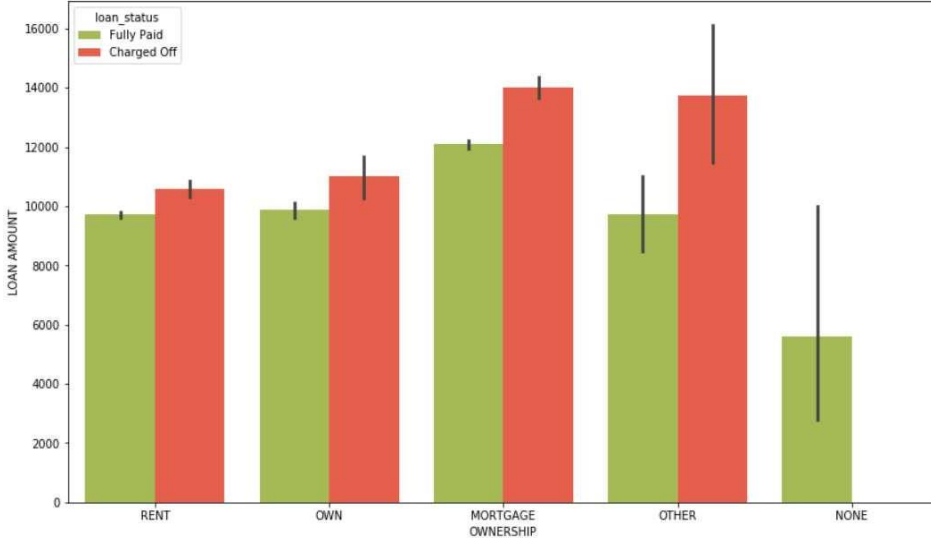
INFERENCE :

- Lower Annual Income for any Grade are more likely to get charge off.
- As the number of installment increase for any income groups the borrowers are more likely to charge off.
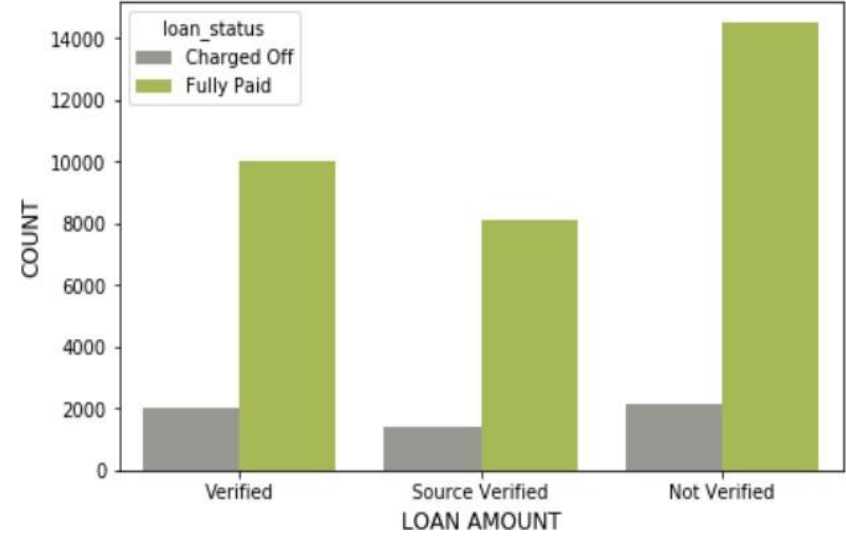
INFERENCE :

- Loan with highest interest rate in all buckets are more likely to charge off.
- As the number of installment increase the borrowers with high interest rate are more likely to charge off.
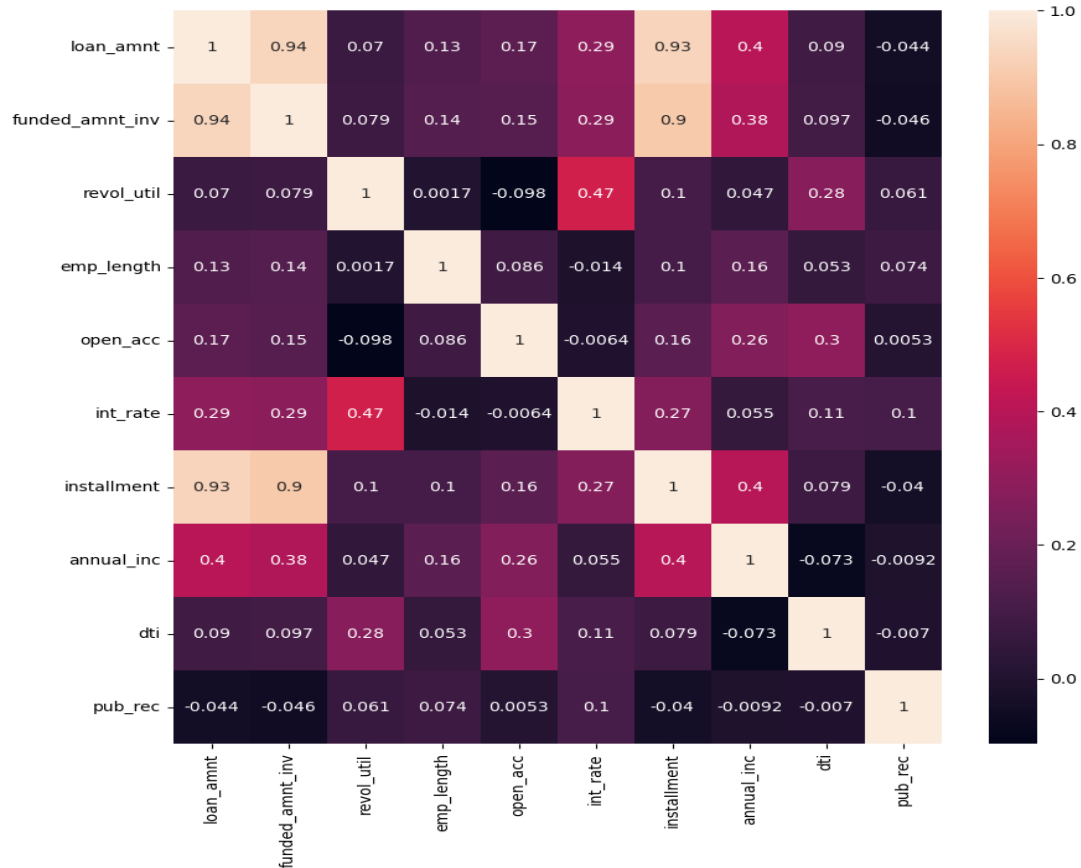
LOAN AMOUNT VS HOME OWNERSHIP

LOAN AMOUNT VS COUNT

INFERENCE :

- Borrowers with verification status "not-verified" has loan amount with 5k to 12.5k are more likely to charge off.
- Borrowers with verification status "not-verified" and "verified" has an equal proportion in charge off.
- Borrowers living on mortgage with loan amount greater than 12k are likely to charge off.
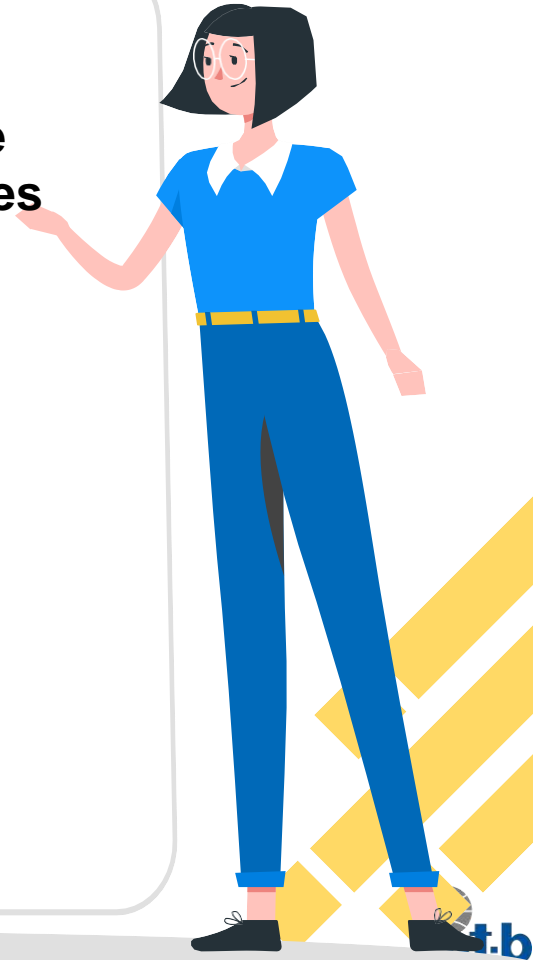
HEAT MAP

INFERENCE :

- loan_amnt has strong positve correlation with installment, total_payment_inv.
- loan_amnt has intermediate positive correlation with annual_inc, int_rate, total_acc.
- open_acc has strong positive correlation with total_acc.
- pub_rec has strong positve correlation with pub_rec_bankruptcies.

After completing exploratory data analysis, we came to conclusion that following features does have impact on Loan defaulters (charged-off) :

- Loan Interest Rate
- Annual Income
- Installments
- Debt to Income ratio(DTI)
- Loan Purpose
- Employment Length
- Term
- Home Ownership
- Loan Amount
- Grade & Sub Grade

THANK YOU ...