BFSI : Credit Risk Assignment

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Process

Objective

- The objective is to build a statistical model to estimate borrowers' **Loss Given Default (LGD)**

$$\text{LGD} = \frac{\textit{Loan Amount} - (\textit{Collateral value} + \textit{Sum of Repayments})}{\textit{Loan\_Amount}}$$

- The loss given default(LGD) is a measure of the amount of loss that a bank is expected to incur in the event of a default by a borrower.

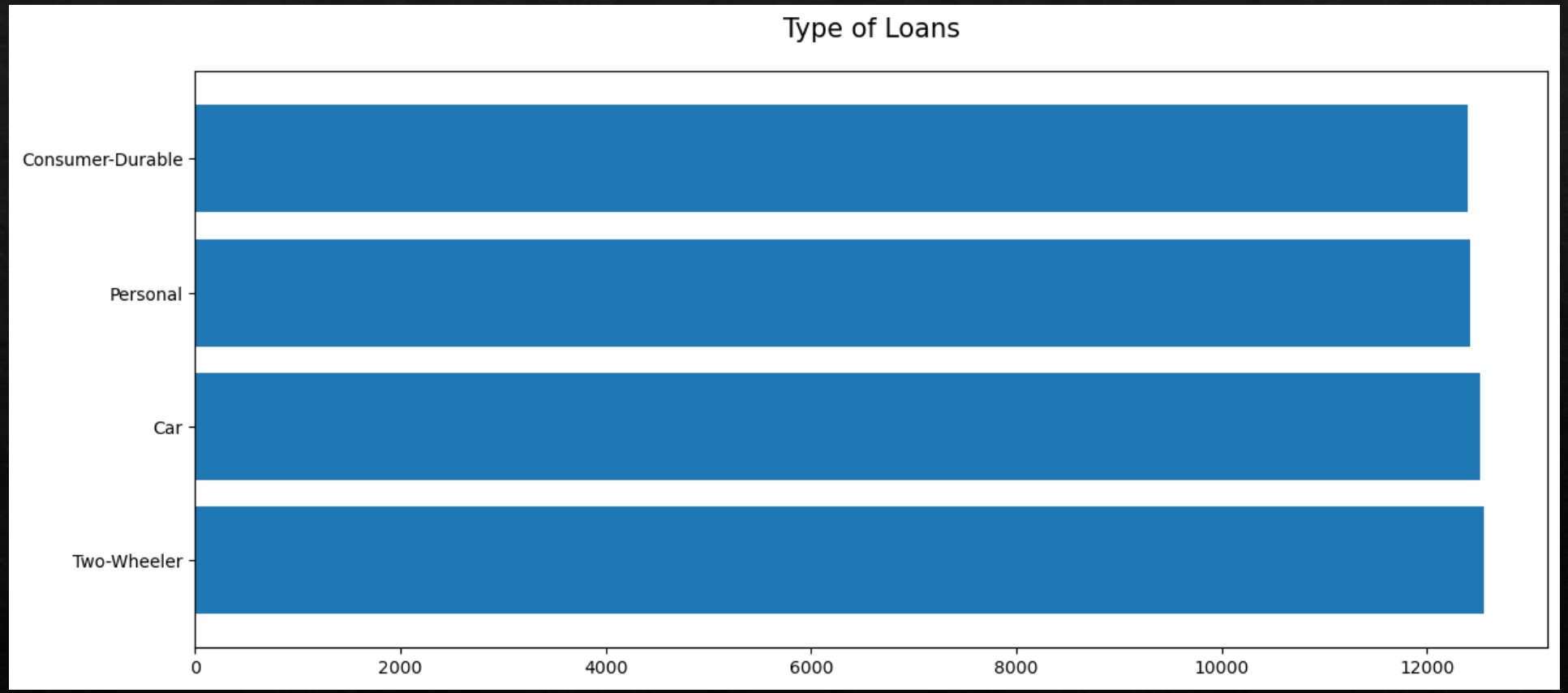
Background

- Credit risk analytics in the context of the banking sector and model a common metric used for estimating the expected credit loss (ECL)
- ECL method is used for provisioning the capital buffer to protect banks against possible default of the customers.
- **Expected credit loss = Exposure at default x Probability of Default x Loss given default**

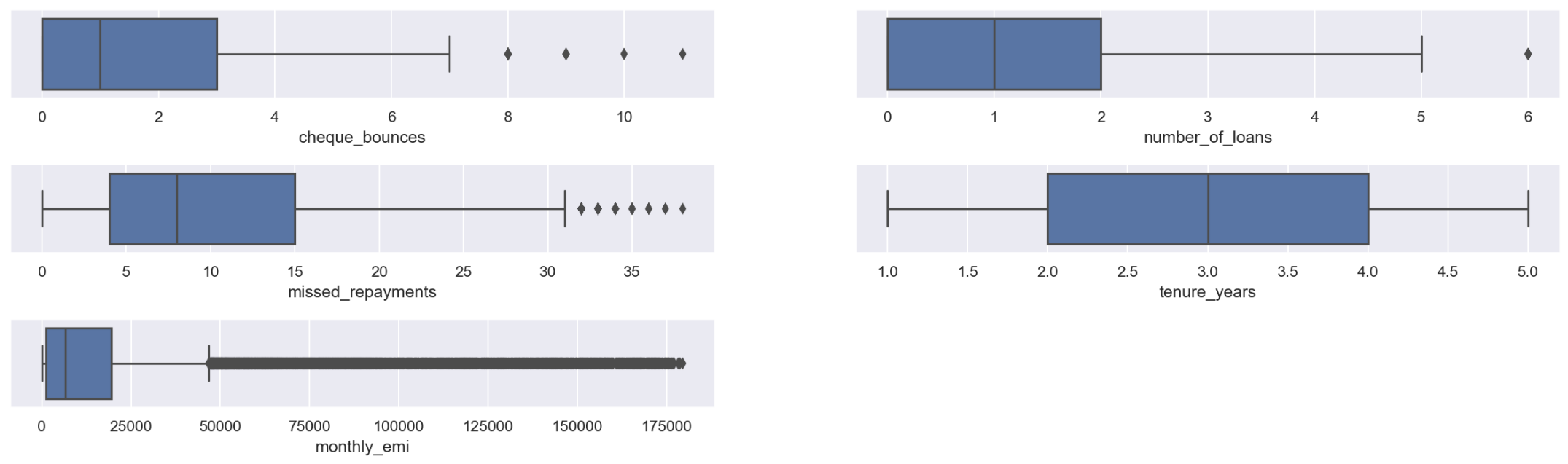
Data Analysis

- Used 3 Datasets for model building
- The main_loan_base dataset.
- The repayment_base dataset.
- The monthly_balance_base dataset.

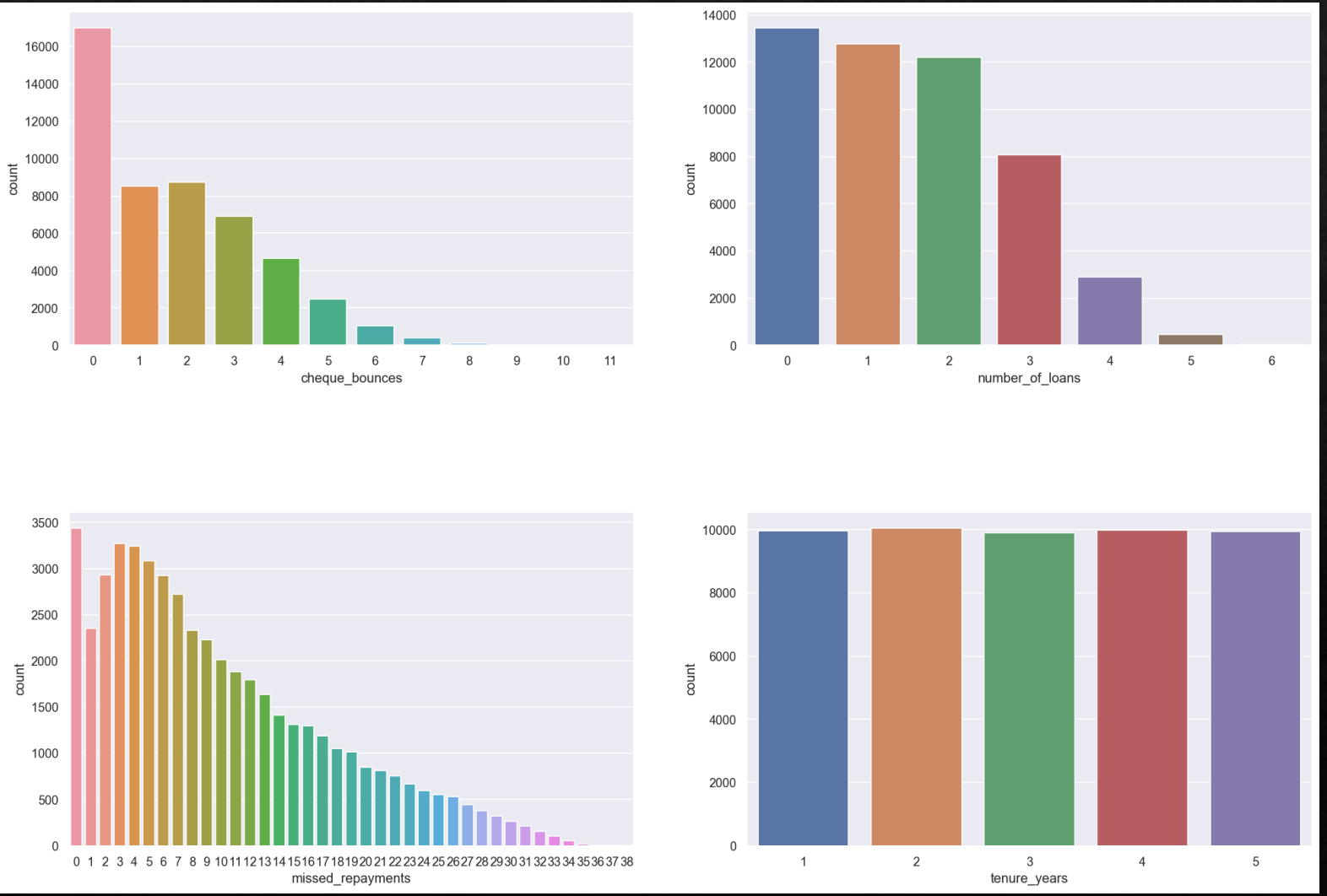
Two Wheeler Loans appear to be Highest



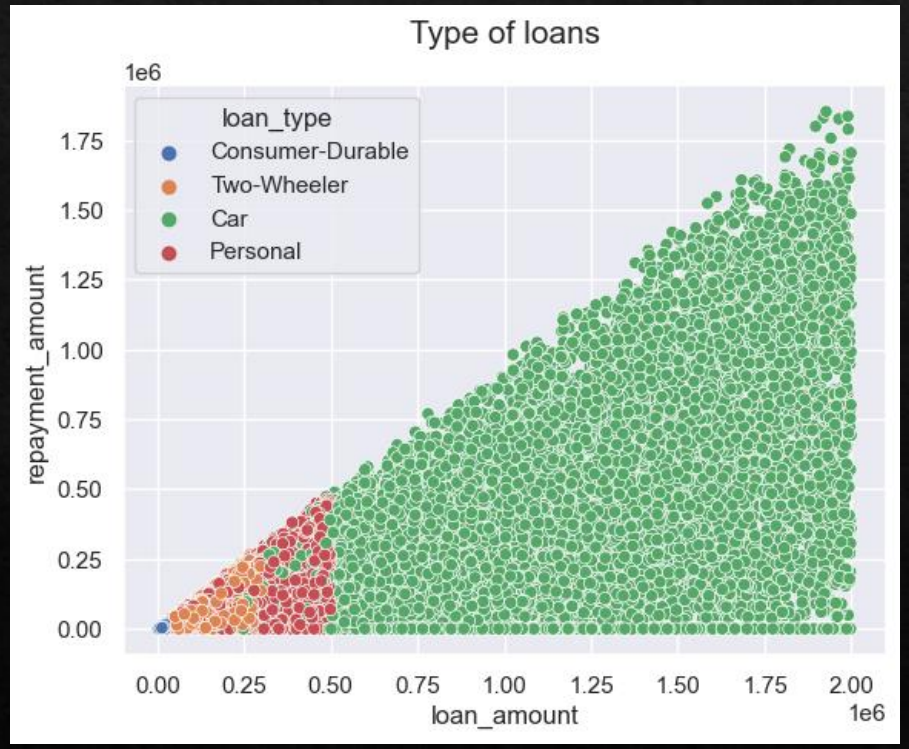
Observations:
Monthly EMIs have enormous outliers. Though it will not effect our analysis
There are few loan accounts who have missed the repayments more than 30 times
Generally people are taking one loan at a time
Generally the loan tenure is 2-4 years
There are few loan account whose cheque has bounced more than 8 times

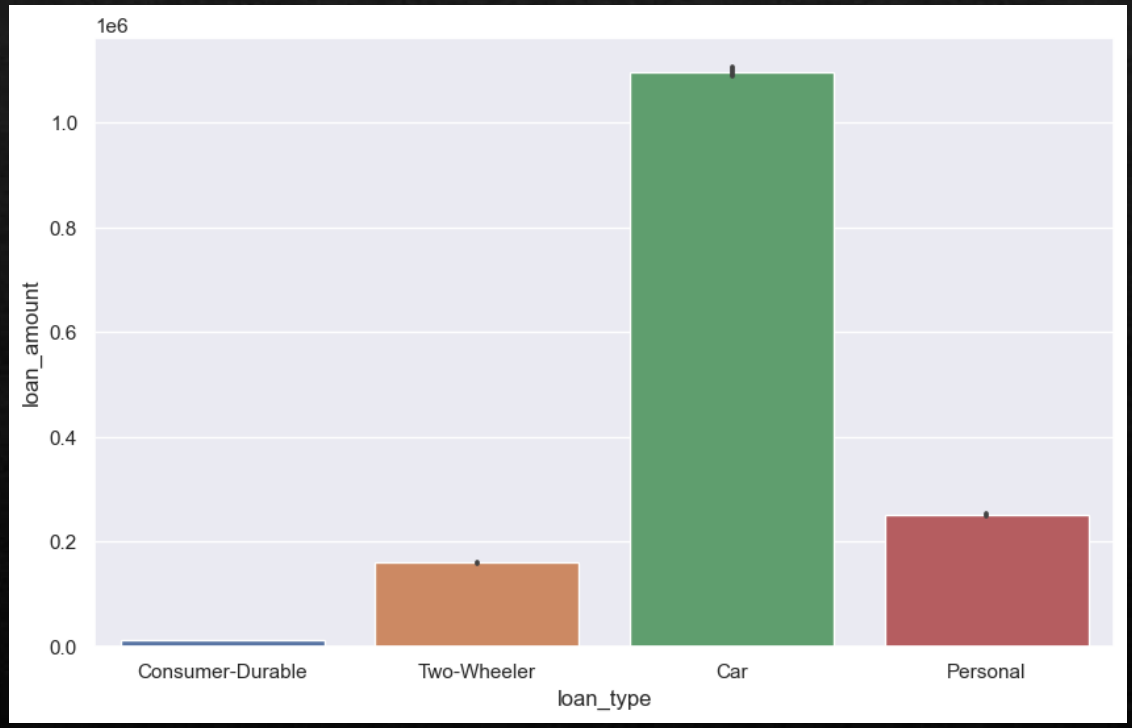


Observation:
1. The cheques of over 16,000 loan accounts have bounced.
2. There is decreasing trend found on missed repayment of loan amount
3. Equal number of people are taking one and two loan at a time

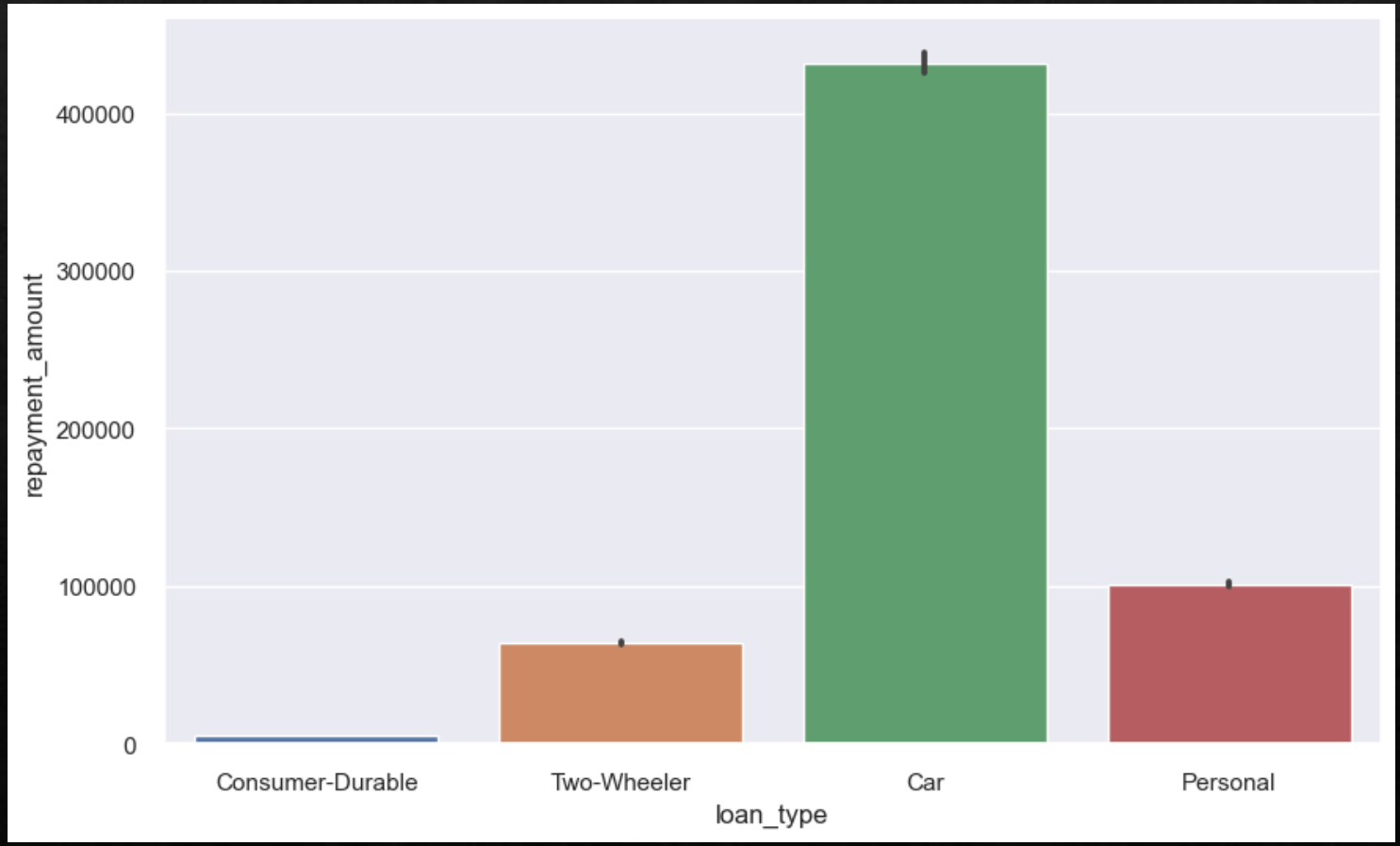


Observation:
Number to Two wheeler loans are maximum
Amount of loan disbursed for Car Loans are maximum

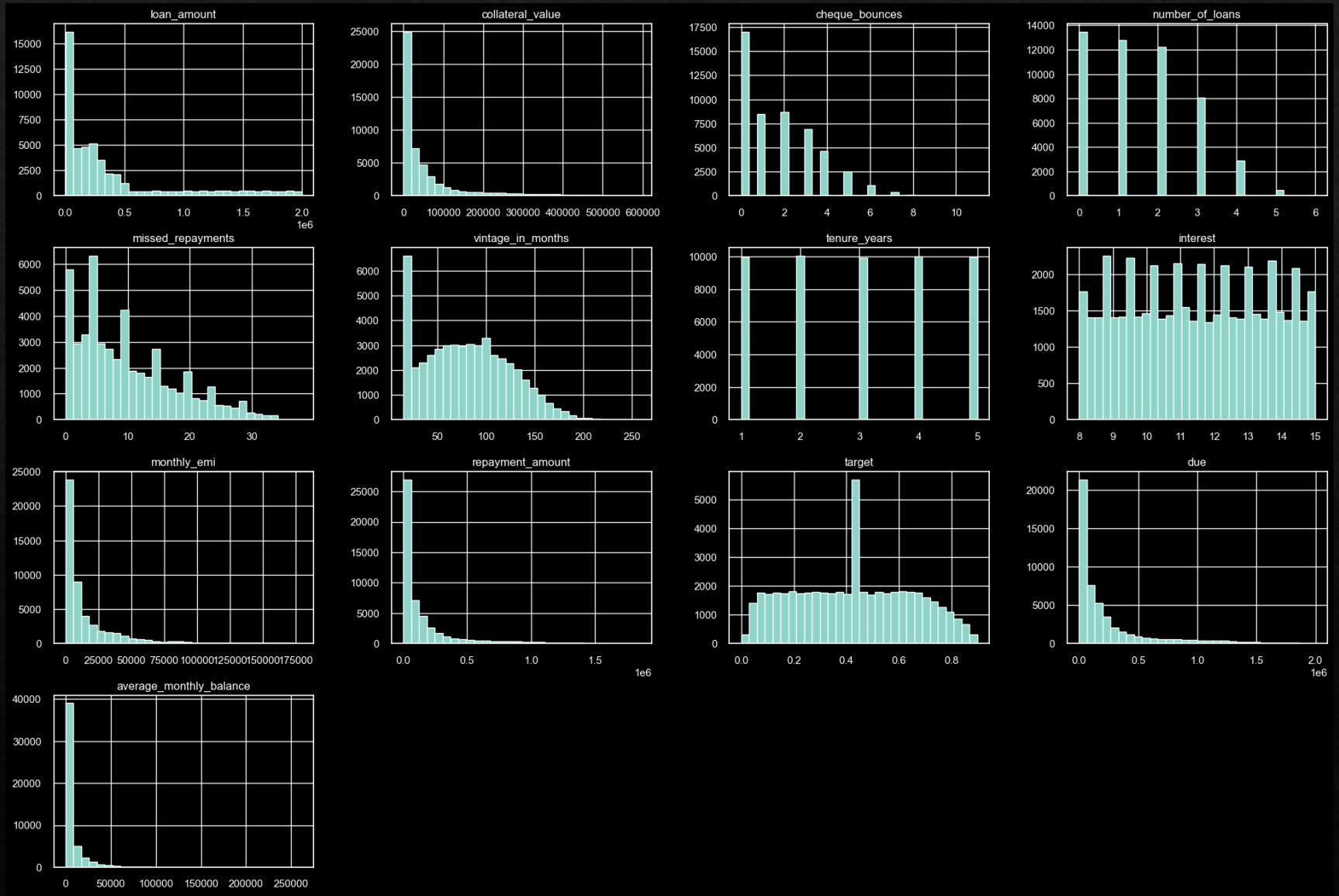




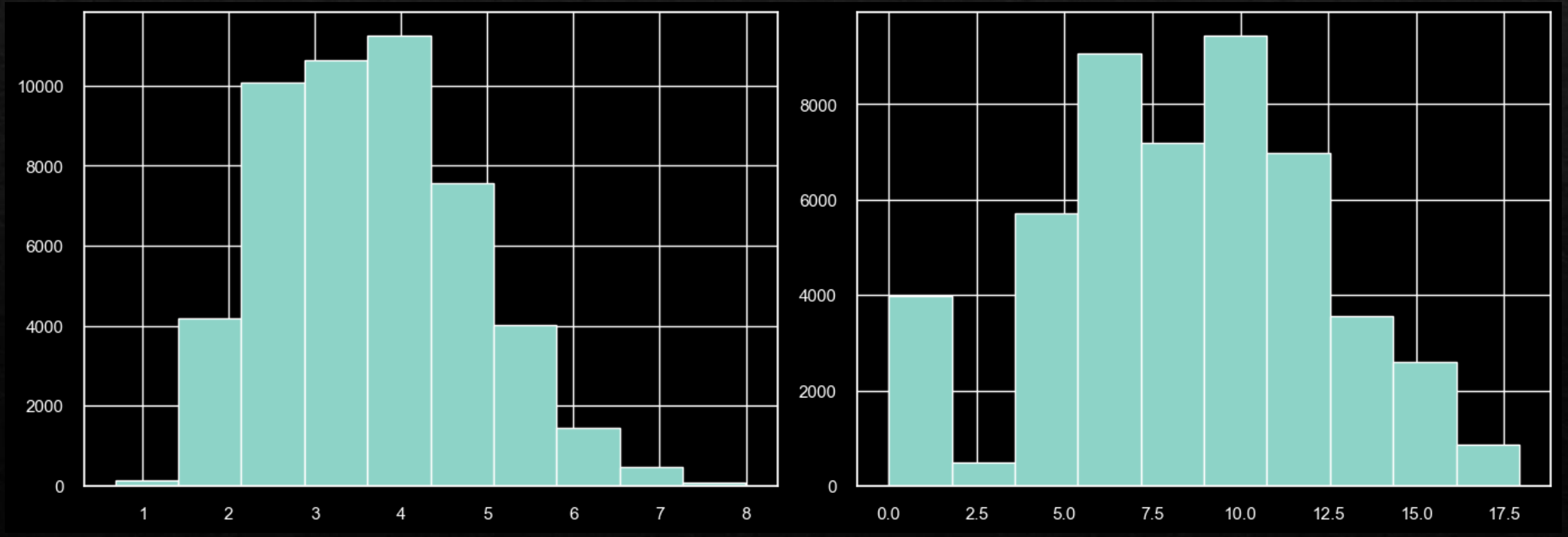
Observation:
Repayment amount & EMI for Car Loans are higher than other loan types



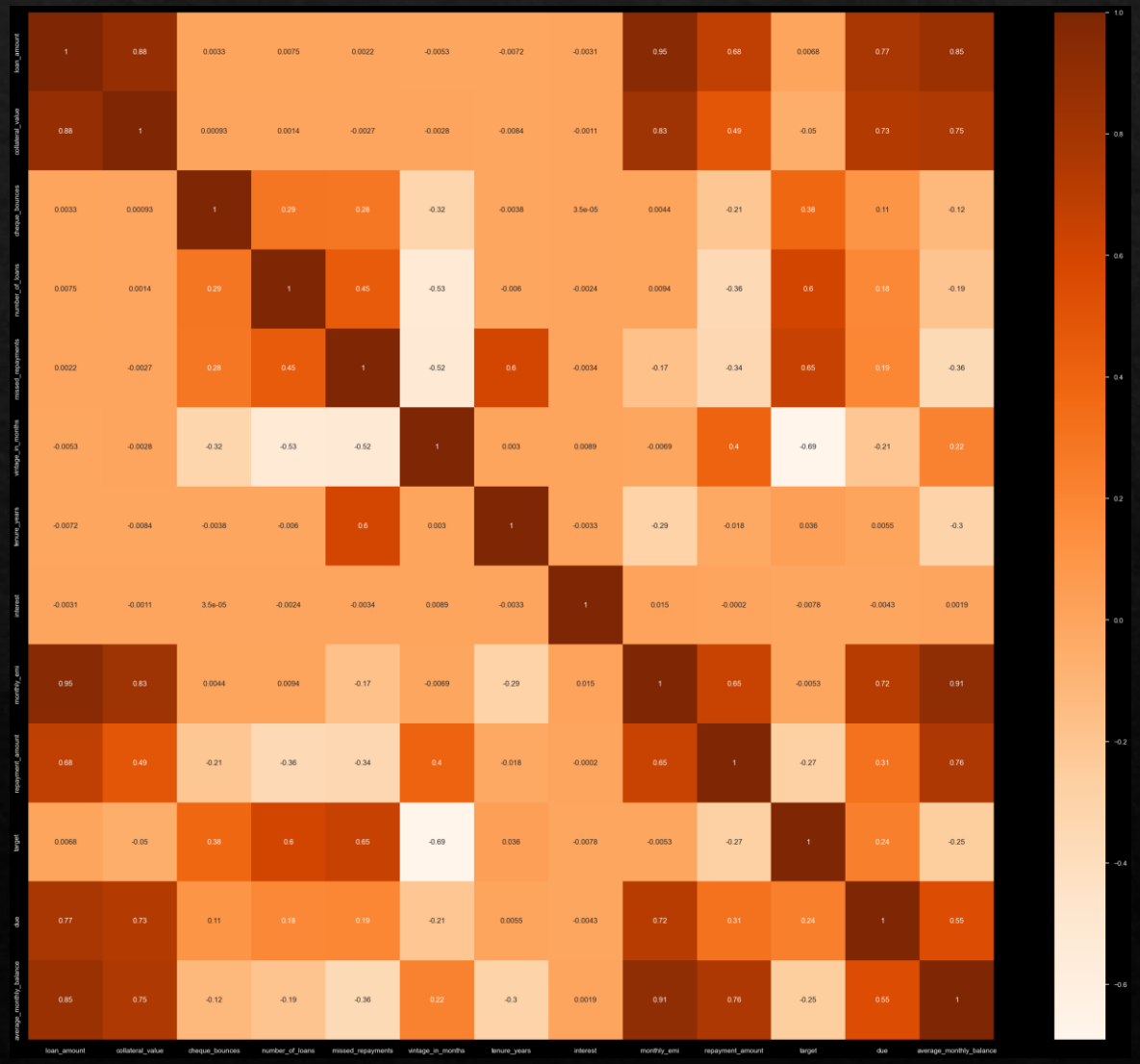
Data Preparation: variable transformation, feature engineering



Power Transformation was used here with respect to the linear regression assumption that all the independent features should have normal distribution



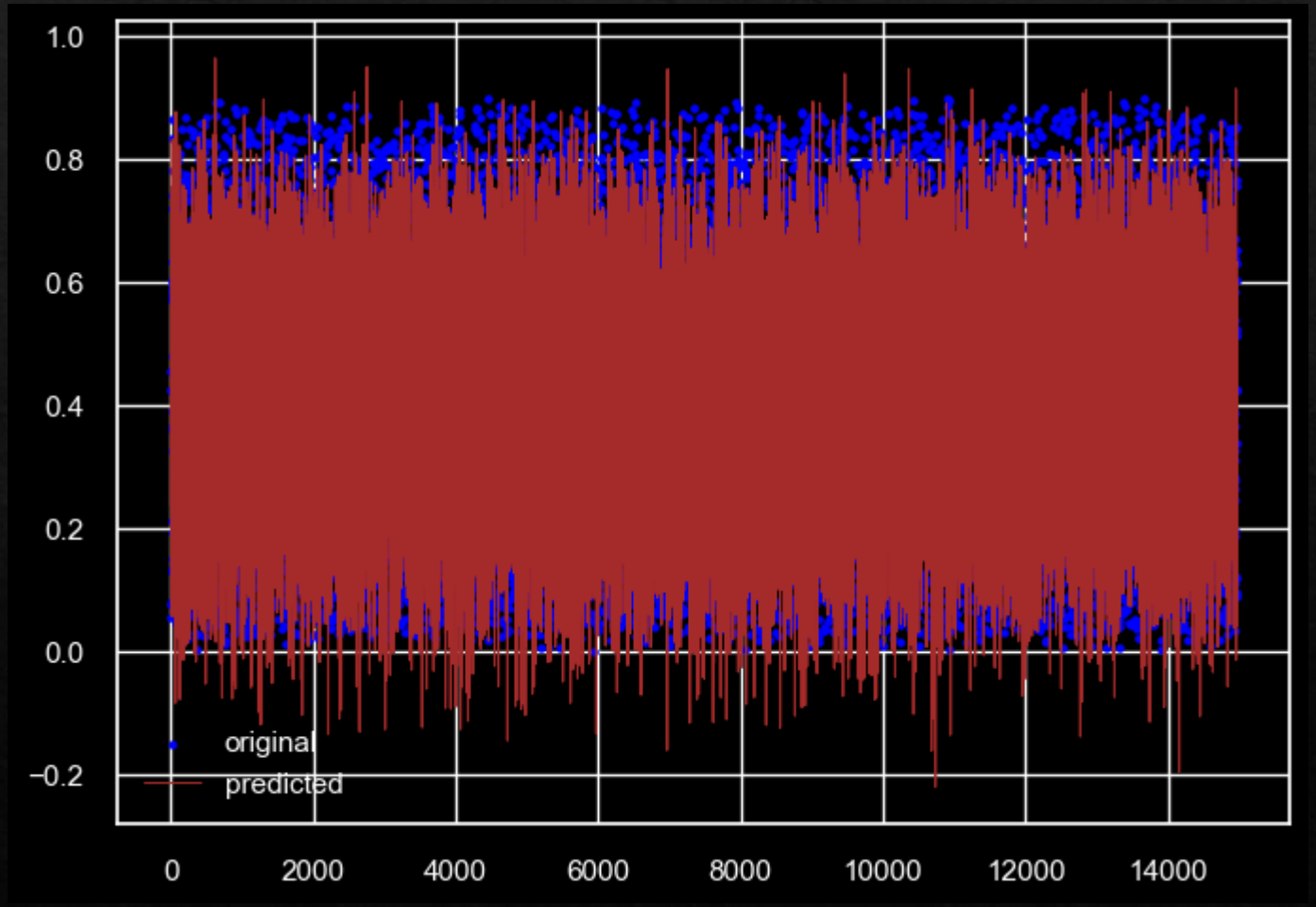
Plotted a Heatmap to understand the correlation between different variables



Model Building

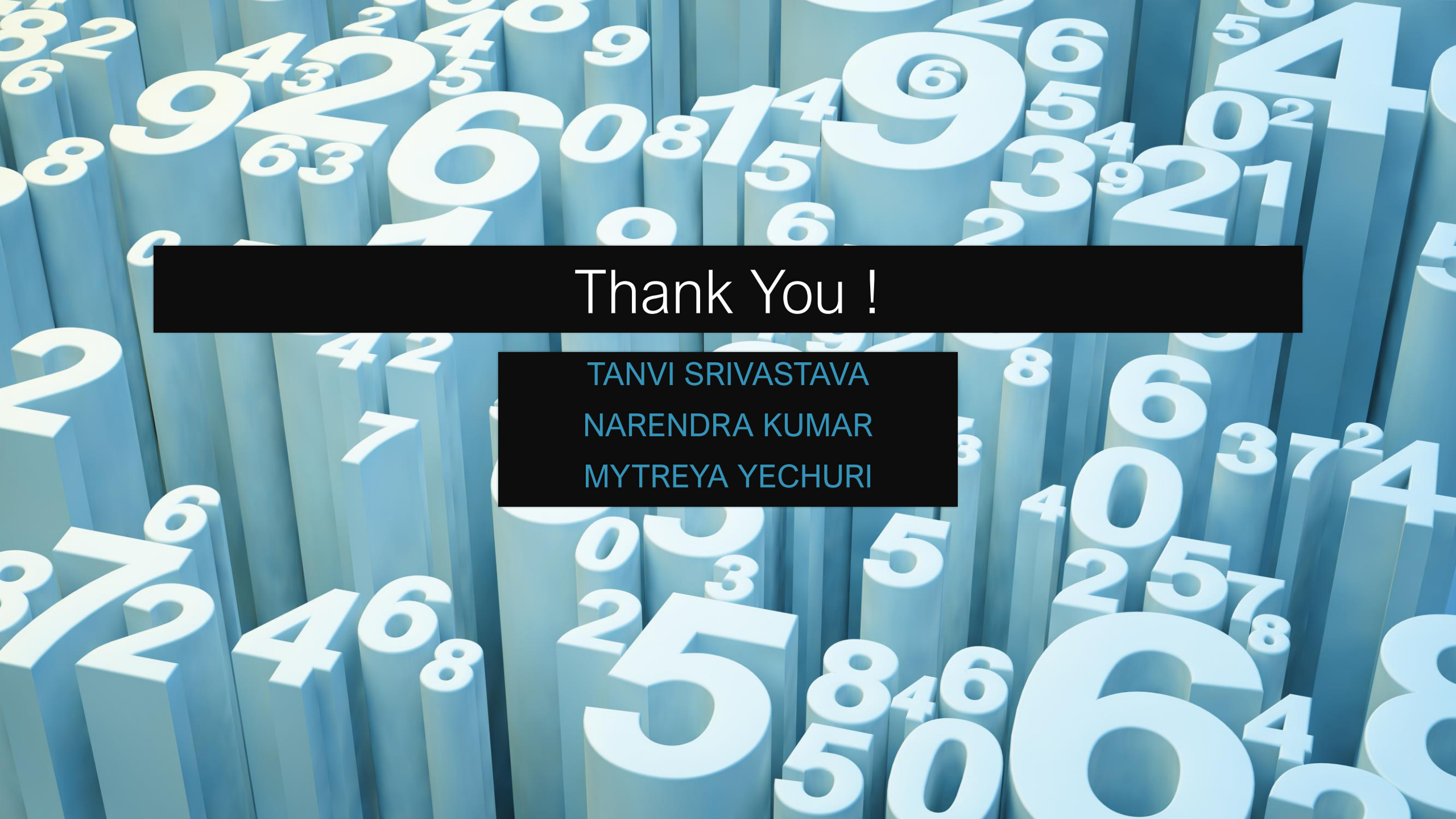
- Used various models like Multiple Linear Regression, Random Forest Regressor, Gradient Boosting Regressor, XGBoost Regressor, Adaboost Regressor, ElasticNet : Hybrid Regularized Model, LightGBM for model building.
- Used R Squared as a performance metrics.
- XGBoost has given us 99.5% R squared on test data across the models.

Original vs Predicted Scatter



Recommendations

- We should focus more on Car and Two-wheeler loan types.
- Missed repayment customers with high repayment amount should be highlighted.
- Customer’s due factors and tenure are another subset of influencers to predict the Loss Given Default of the customers.
- Recommendations made are subjected to the insights obtained from data set after thorough analysis.


Thank You !
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