Analytical Case Study and Report

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Company Overview

TVS Credit Services Ltd. is a prominent Indian financial services company specializing in vehicle financing. Part of the TVS Group, it offers loans for two-wheelers, three-wheelers, and commercial vehicles, as well as loan against vehicles. With a focus on customer-centric solutions and flexible repayment options, TVS Credit ensures quick processing and wide accessibility through its extensive network of branches and partnerships. The company also leverages digital platforms to enhance the loan application and management experience.

Challenges and Objectives

Challenges

- Data Quality and Integration
- Feature Selection
- Model Selection and Validation
- Handling Imbalanced Data
- Integration and Implementation
- Regulatory and Ethical Considerations

Objectives

- Improve Decision-Making and Efficiency
- Conduct Qualitative Analysis
- Develop a Robust Fraud Detection Model
- Enhance Data Understanding

S	W	O	T
Strengths	Weaknesses	Opportunities	Threats
TVS Credit stands out in the financial services sector by offering specialized financing solutions for consumer durables, including both mobile and non-mobile items. Unlike many competitors, the company provides tailored loan products that meet the specific needs of customers purchasing electronics, home appliances, and vehicles. Its unique value is further enhanced by advanced analytics and a thorough understanding of consumer behavior, enabling precise credit assessments and personalized loan terms. This approach not only improves customer experience but also reduces the risk of loan defaults, setting TVS Credit apart in a competitive market.	TVS Credit's primary weaknesses include a heavy reliance on the consumer durables segment, which can be vulnerable to economic fluctuations and shifts in consumer spending habits. Additionally, the company faces challenges with data integration and consistency, which can impact the accuracy of credit assessments. Limited diversification beyond consumer durables may restrict growth opportunities and make the company more susceptible to sector-specific downturns. Finally, competition from larger financial institutions with broader product offerings and advanced technology may pressure TVS Credit to continually innovate and enhance its services to stay relevant.	TVS Credit has significant opportunities to expand its market presence by diversifying into new financial products and services beyond consumer durables, potentially capturing a broader customer base. The growing adoption of digital financial solutions presents an opportunity for the company to enhance its technological capabilities and offer more innovative, user-friendly services. Additionally, expanding into underserved regions or segments can drive growth, while strategic partnerships with e-commerce platforms and retailers could further integrate their financing solutions into consumer purchasing decisions.	TVS Credit faces several threats, including increasing competition from both established financial institutions and fintech startups that offer more innovative or lower-cost financing solutions. Economic downturns or shifts in consumer spending patterns can negatively impact loan demand and increase default rates. Additionally, regulatory changes and data security concerns pose risks to the company's operations and reputation. The rapid pace of technological advancements also means that TVS Credit must continuously invest in new technologies to stay competitive and meet evolving customer expectations.

TVS CREDIT

PROBLEM STATEMENT

The objective is to develop a method for identifying customers who have a high likelihood of being fraudulent based on the information provided. A comprehensive solution should detail the approach, observations, and inferences drawn from the data. Each stage of the decision-making process must be documented and supported by data-driven observations

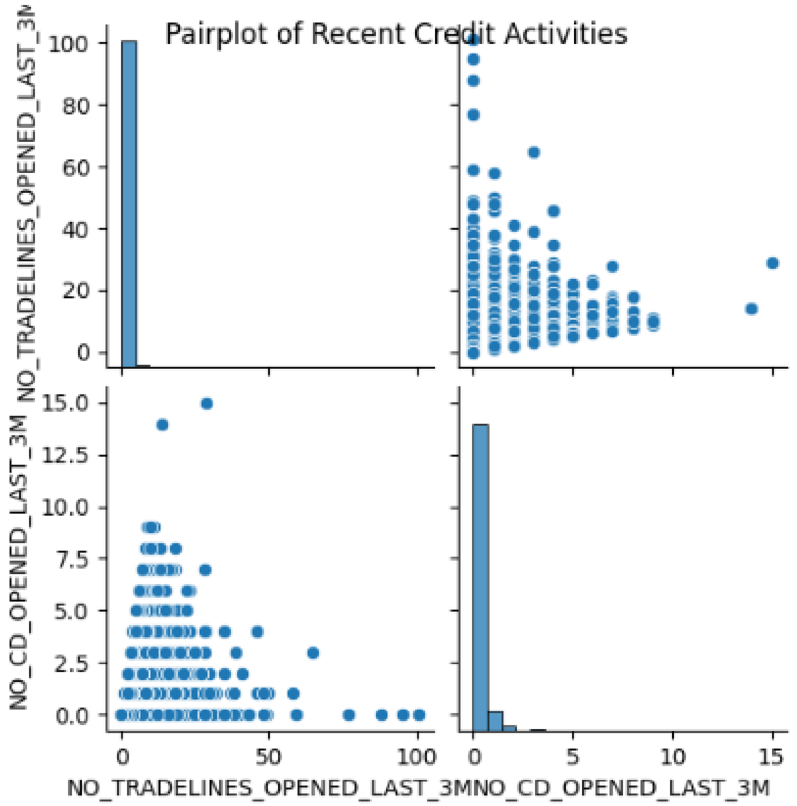
SOLUTION

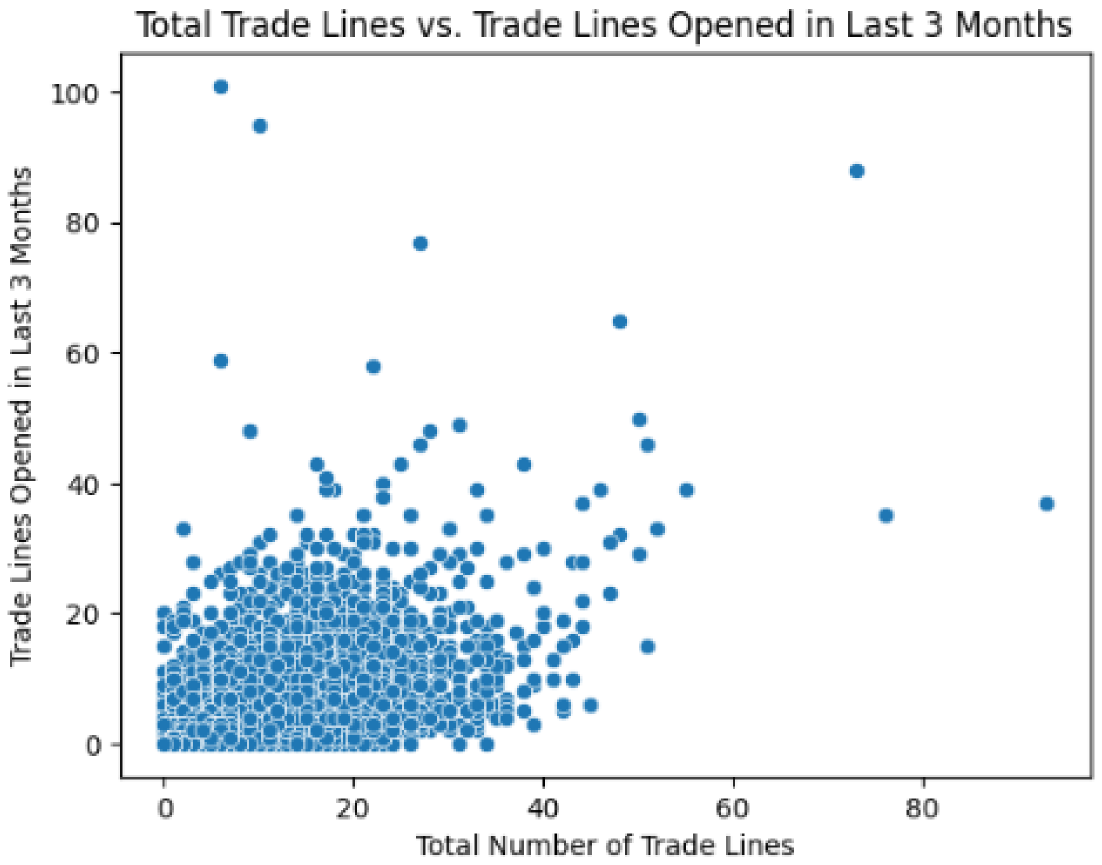
Data cleaning and data manipulation.
1.Check and handle duplicate data.
2.Check and handle NA values and missing values.
3.Drop columns, if it contains a large amount of missing values and not useful for the analysis.

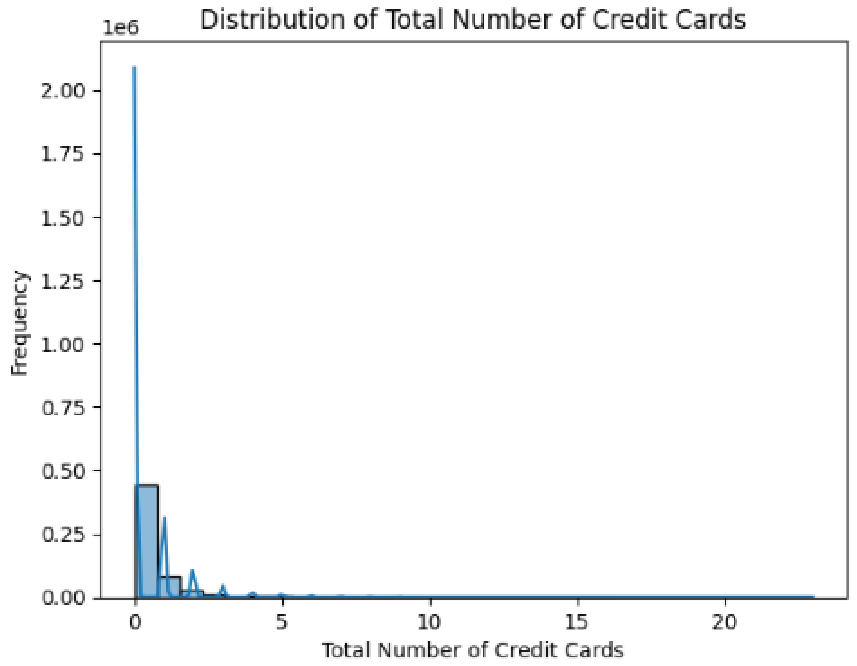
EDA.
1.Univariate data analysis: value count, distribution of variable etc.
2.Bivariate data analysis: correlation coefficients and pattern between the variables etc.

MODEL USED.
Random forest

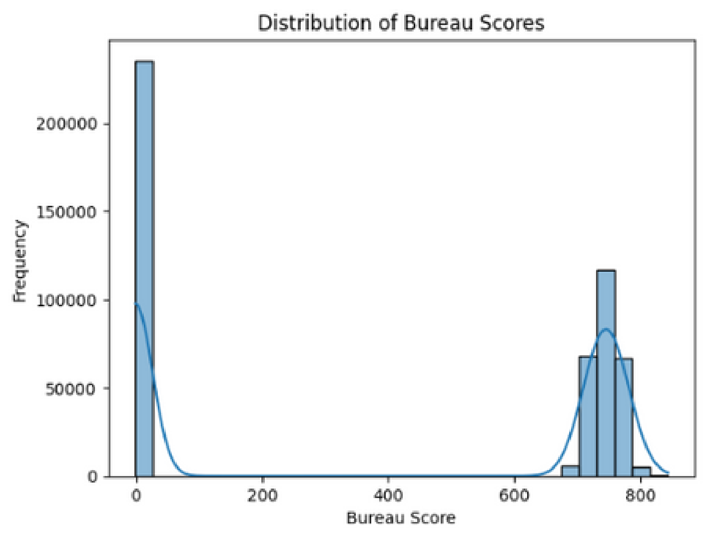
CUSTOMER BEHAVIOUR ANALYSIS

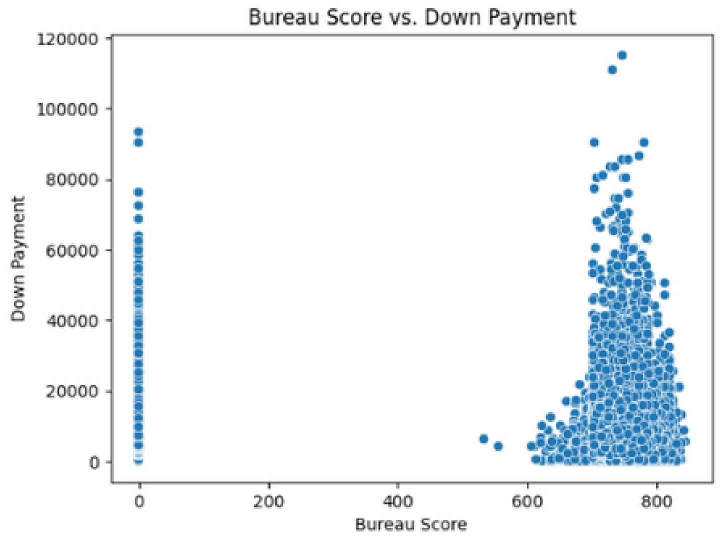


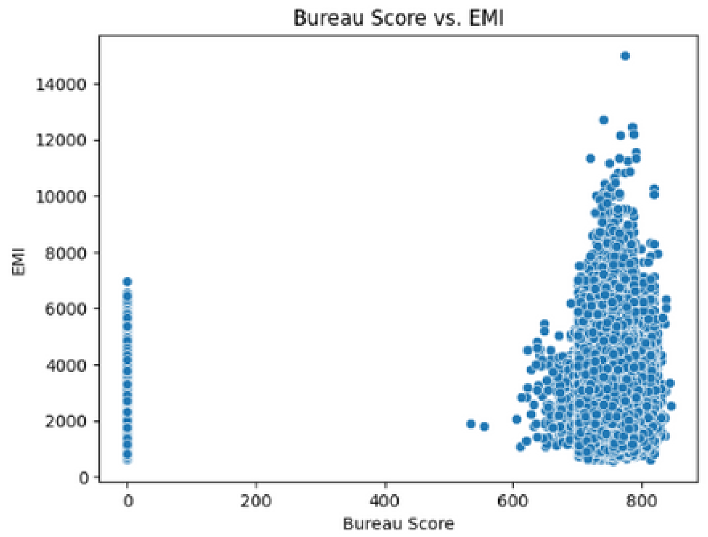


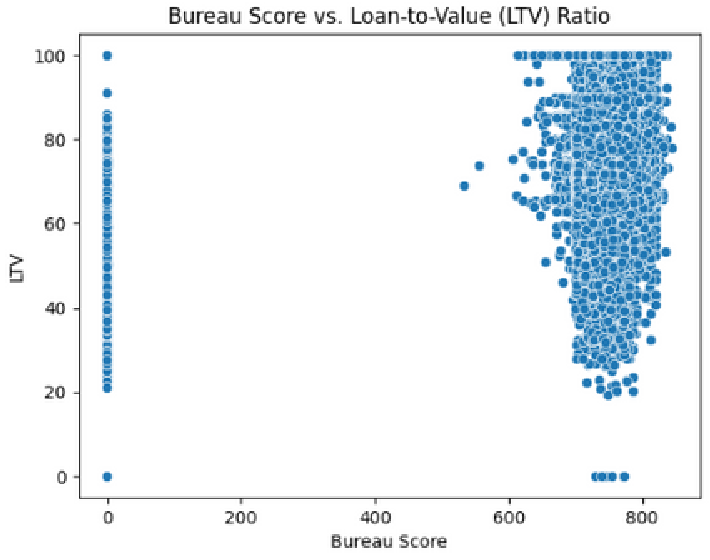


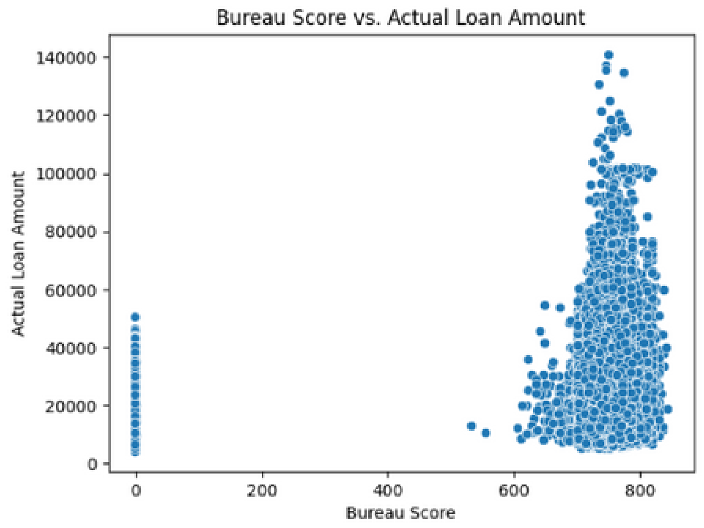
Customers with higher overall credit activity, as seen through multiple trade lines and credit cards, are actively engaging in credit behavior, which might point to either financial growth or potential over-leveraging. This pattern can be compared to industry competitors to assess whether similar trends exist, highlighting any unique positioning or risk among the customer base.









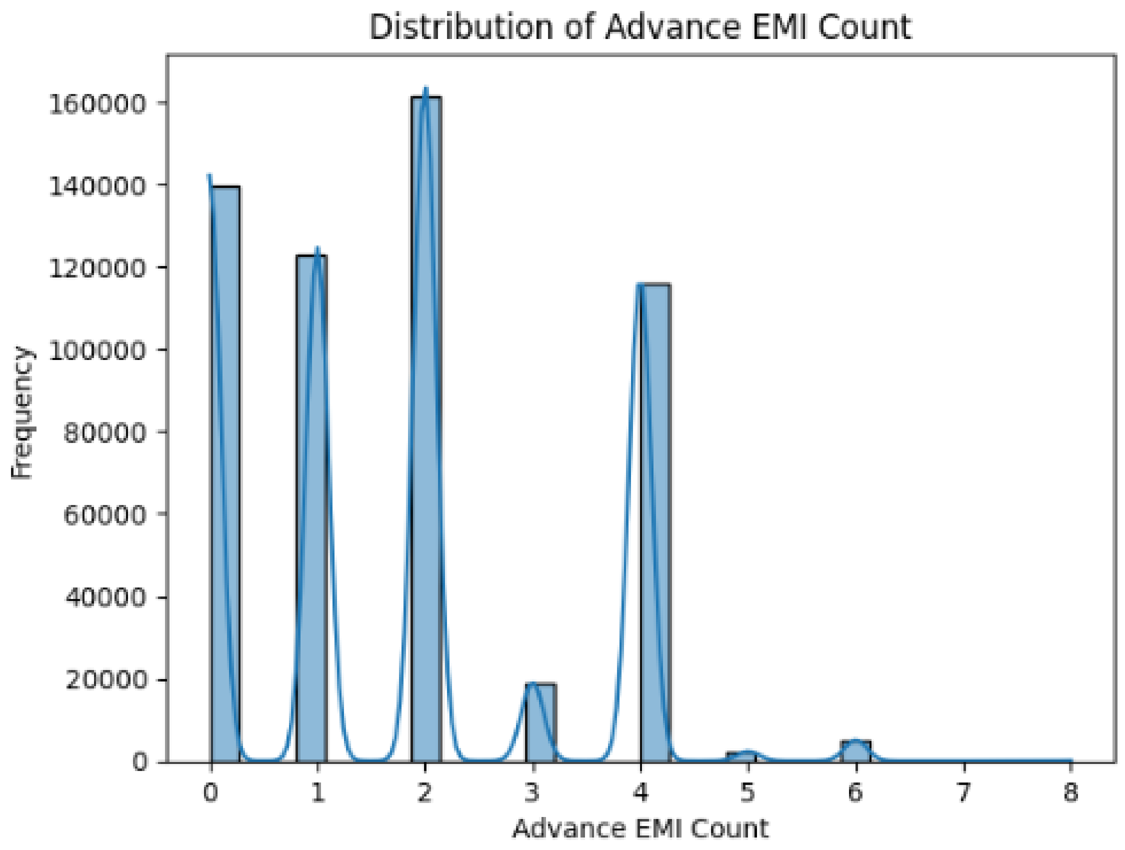


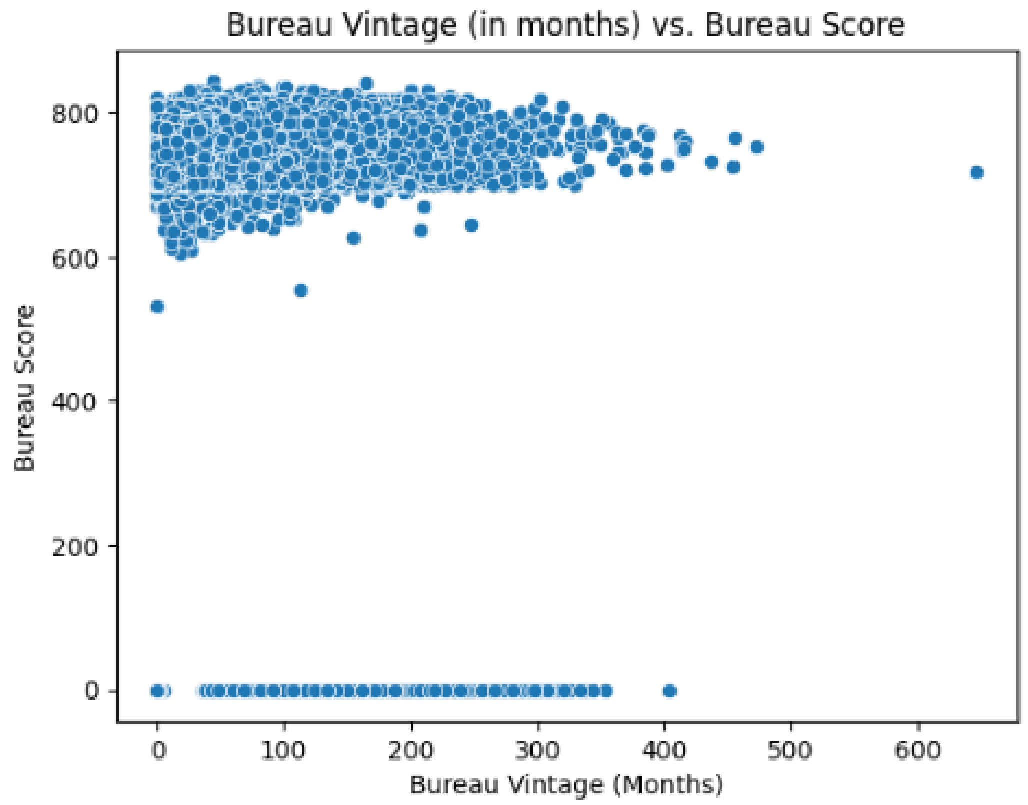
CREDIT SCORE ANALYSIS

The overall trend suggests that customers with lower credit scores are often associated with higher financial risk, as indicated by higher EMIs, higher LTV ratios, and smaller down payments. This pattern aligns with industry trends that emphasize cautious lending to individuals with lower credit scores, reflecting a risk management strategy common across the financial sector.

DEFAULT RISK ANALYSIS

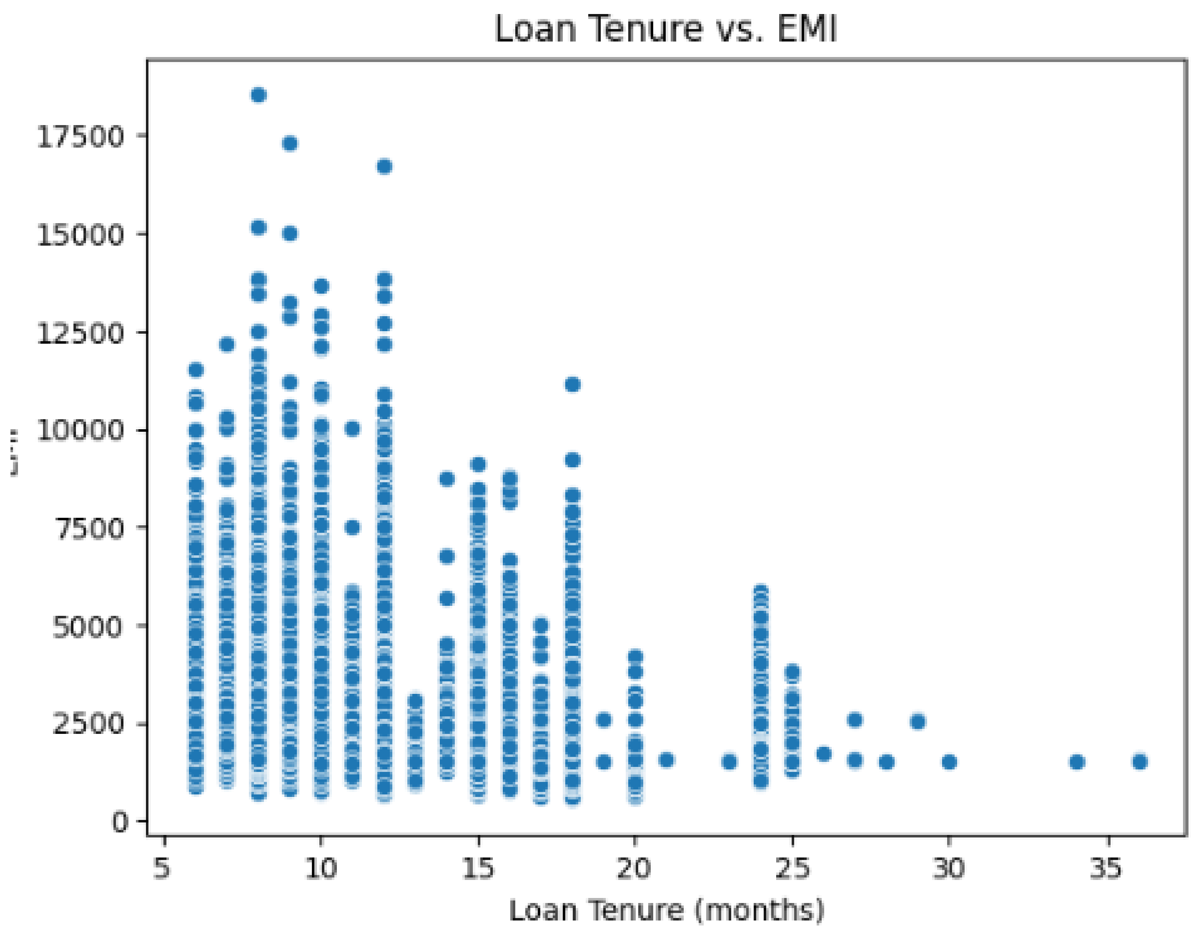
The overall analysis highlights a strong relationship between credit history length, credit score, and financial behavior (such as advance EMI payments). Customers with shorter credit histories and lower credit scores are identified as higher risk, receiving smaller loans and typically not making advance payments. This pattern aligns with industry trends of risk-based pricing and lending, where credit history plays a pivotal role in financial decision-making.

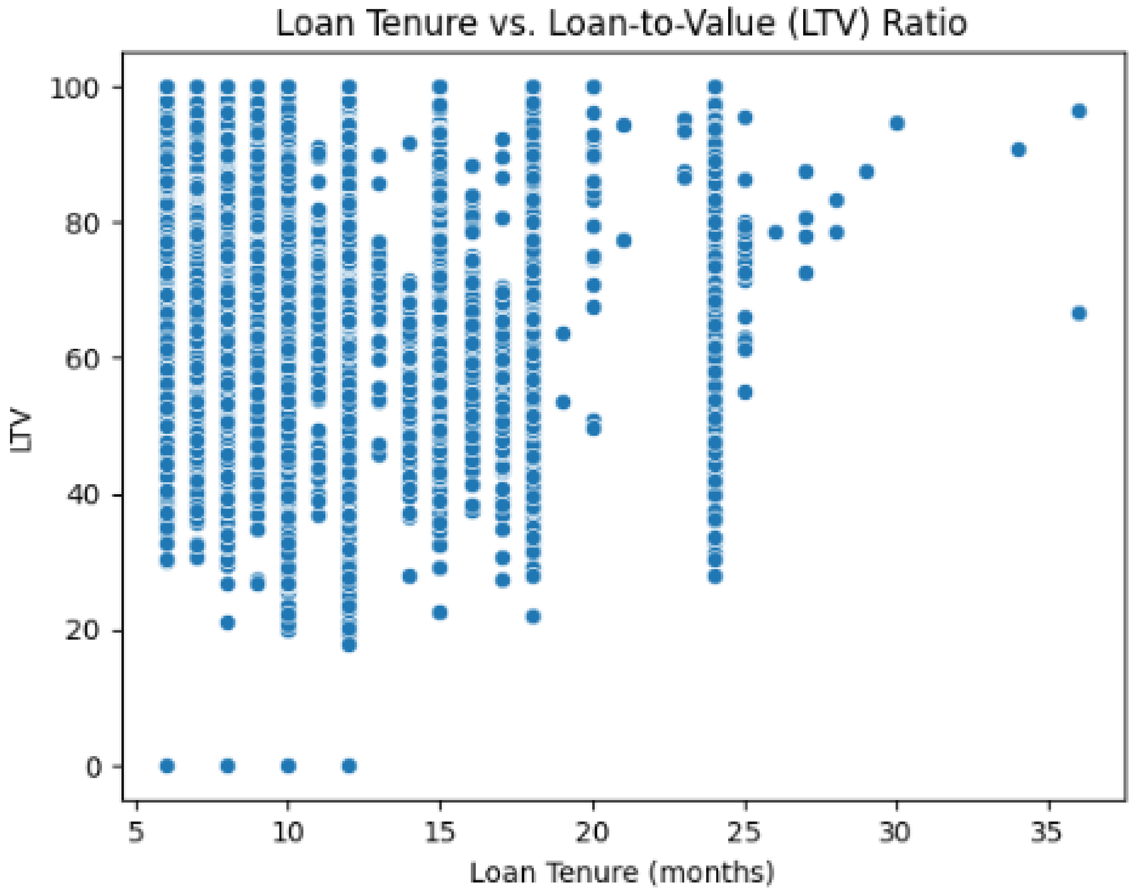




LOAN TENURE ANALYSIS

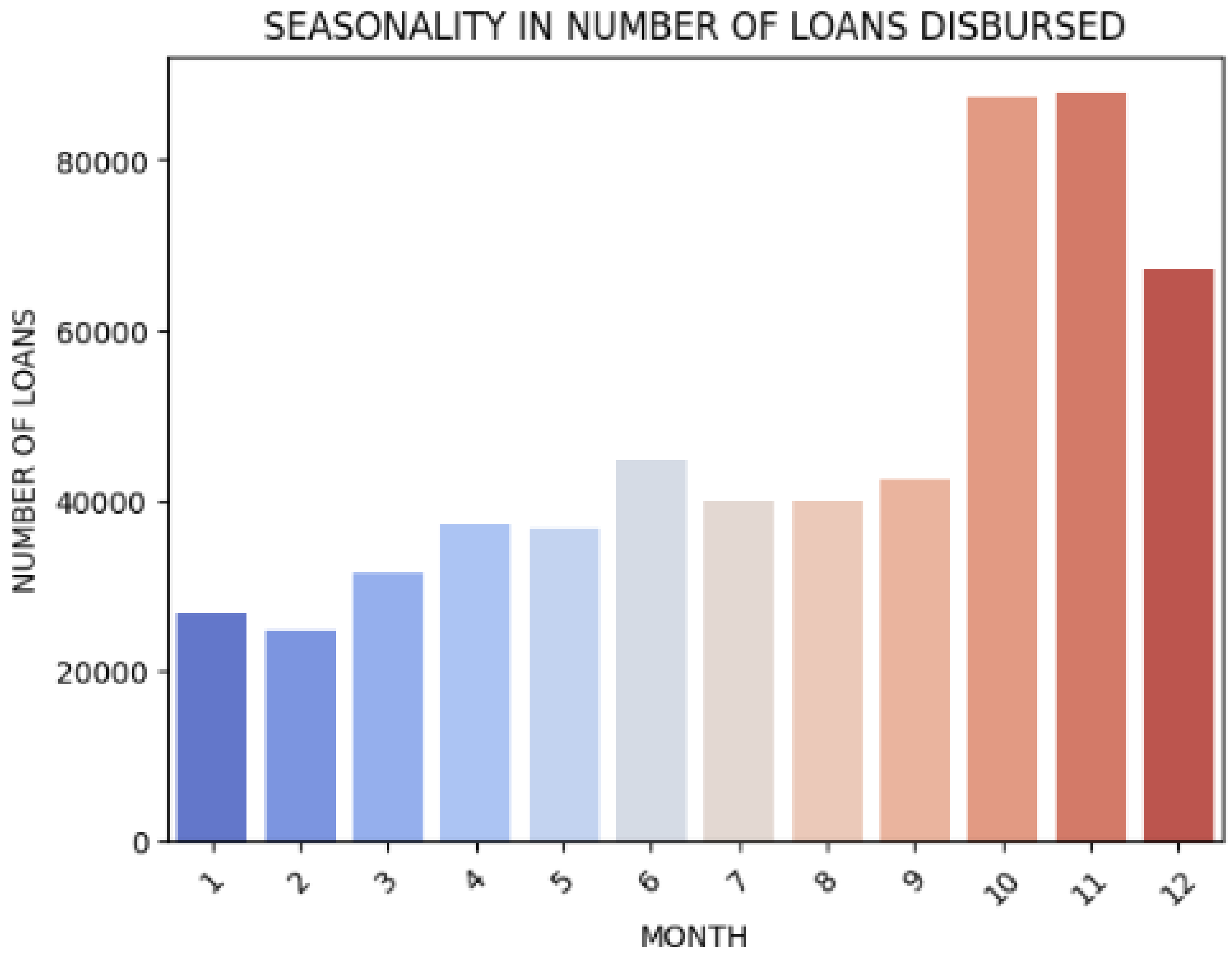
- Borrowers with longer loan tenures tend to have lower EMIs, which could indicate affordability considerations.
- The LTV ratio does not appear to be strongly influenced by loan tenure, implying that other factors may play a more significant role in determining the LTV ratio.





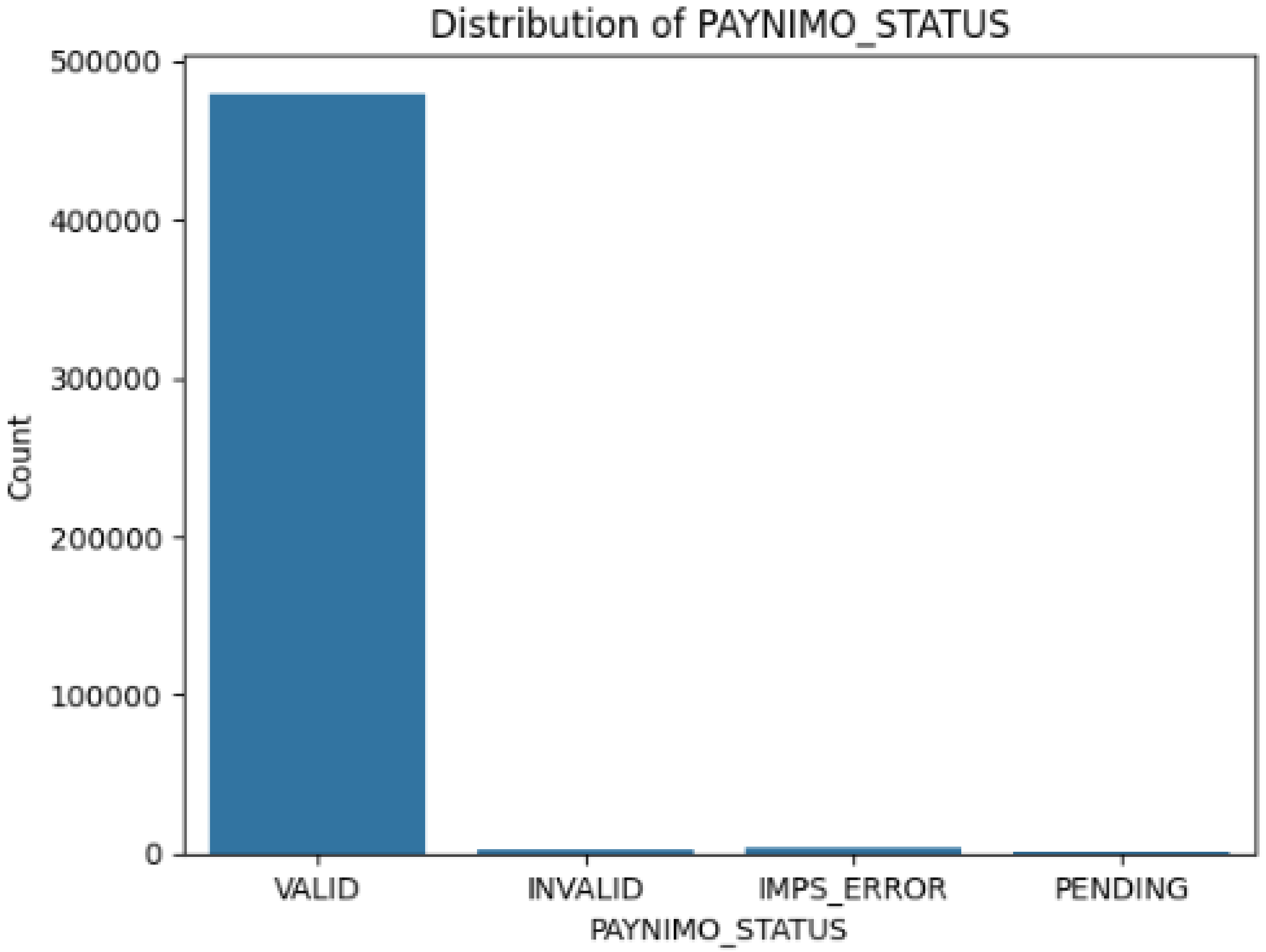
SEASONALITY ANALYSIS

The seasonality analysis reveals a clear upward trend in loan disbursements throughout the year, with the highest peaks occurring in October and November, likely due to festive spending and end-of-year financial activities. The early months (January to April) show the lowest loan activity, with a gradual increase from May to September, culminating in the year-end spike. This pattern suggests that loan demand is significantly influenced by seasonal factors, particularly around major festivals and the financial year's closing.



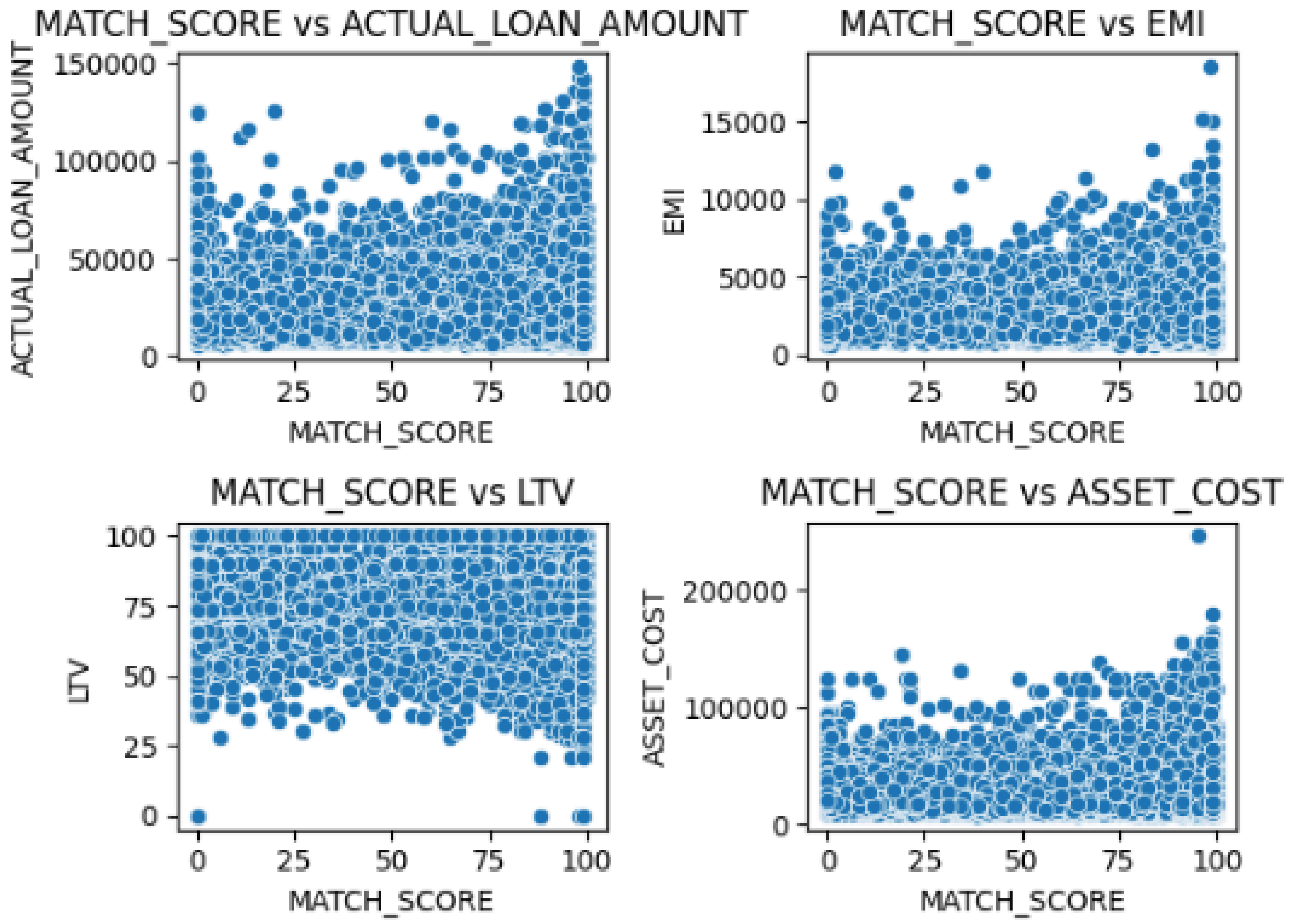
ACCOUNT VALIDATION ANALYSIS

The "ACCOUNT VALIDATION ANALYSIS" shows that the overwhelming majority of accounts are categorized as "VALID," with a count exceeding 400,000, indicating that most accounts pass the validation process smoothly. In contrast, only a very small number of accounts fall under the "INVALID," "IMPS_ERROR," and "PENDING" categories, highlighting that issues with account validation are rare. Overall, the analysis suggests that the validation process is highly effective.



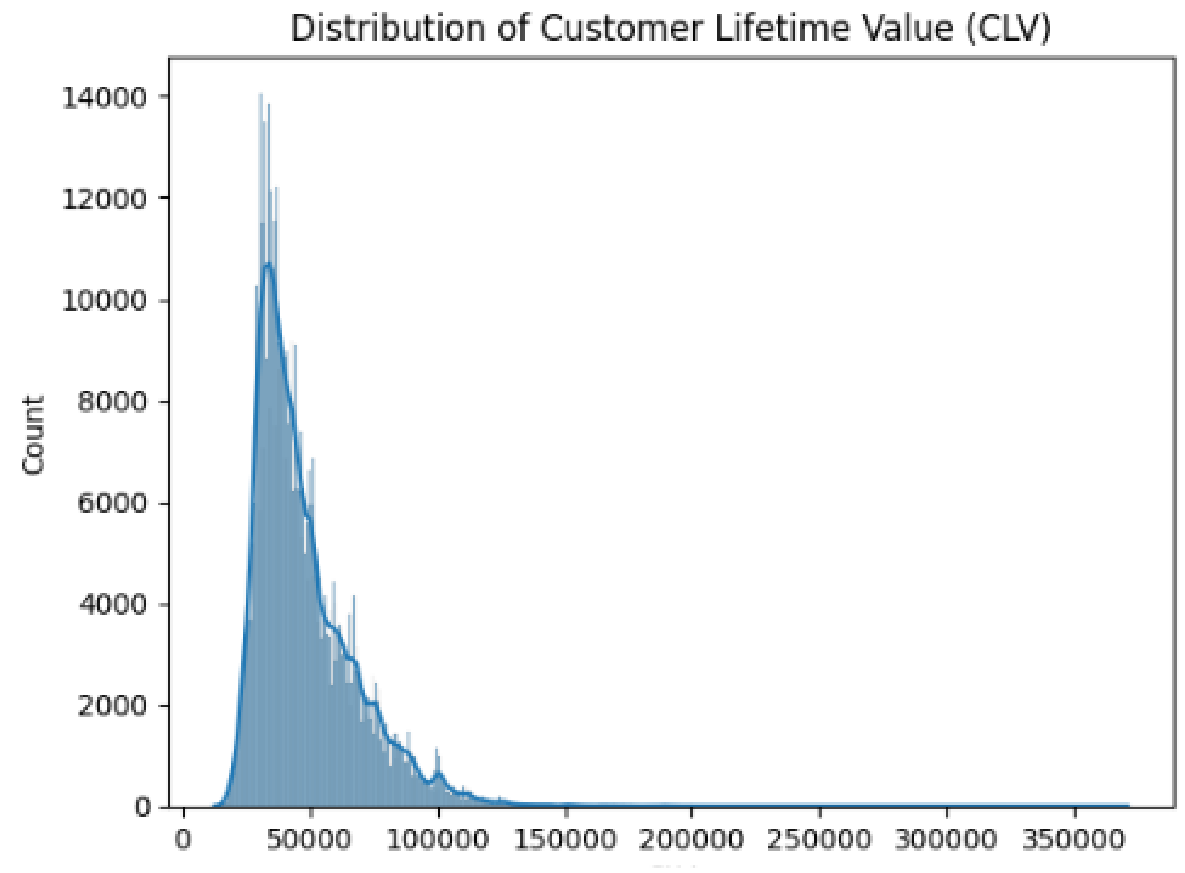
KYC ACCURACY ANALYSIS

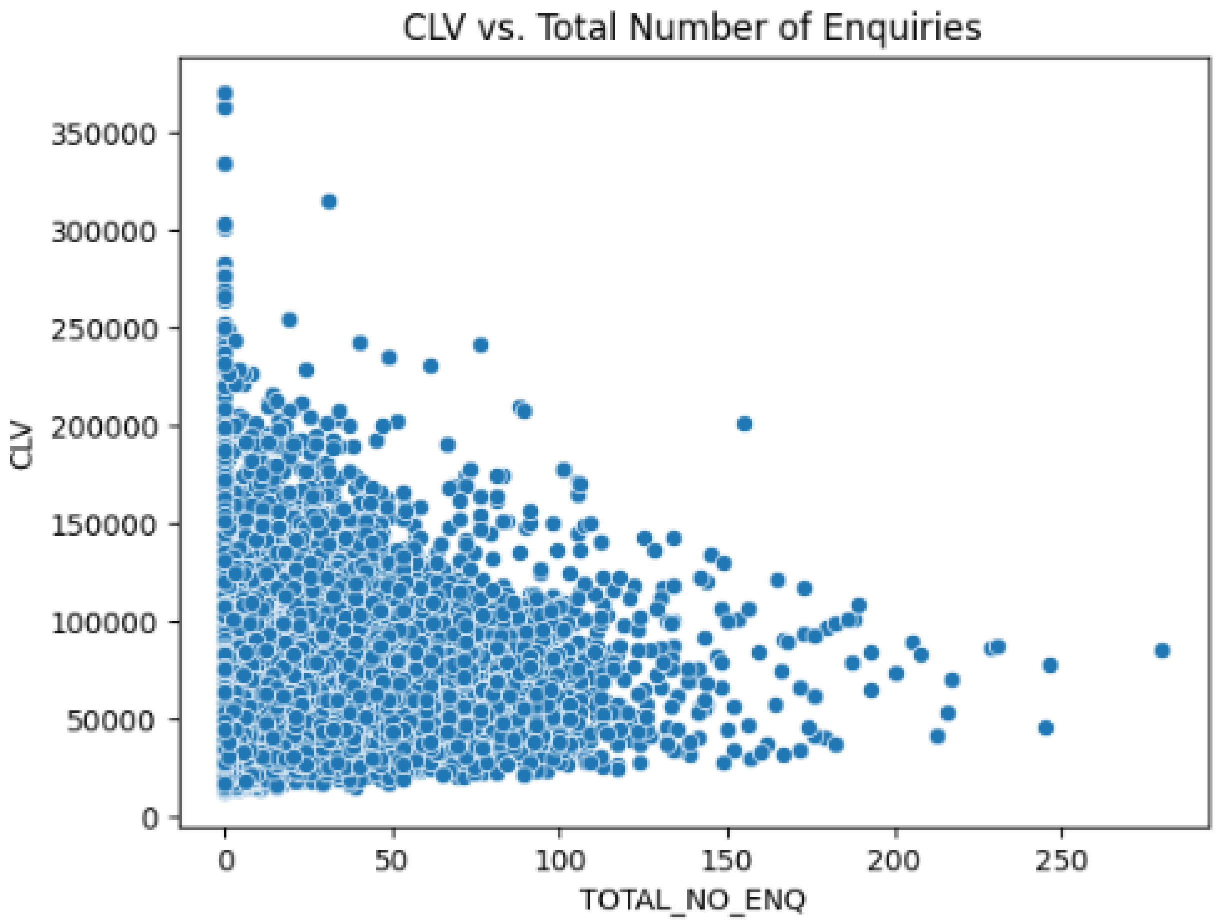
The MATCH_SCORE has a weak to moderate relationship with the financial metrics analyzed, implying that while KYC accuracy is important, it should be considered alongside other factors for more accurate financial decision-making.



CUSTOMER LIFETIME VALUE

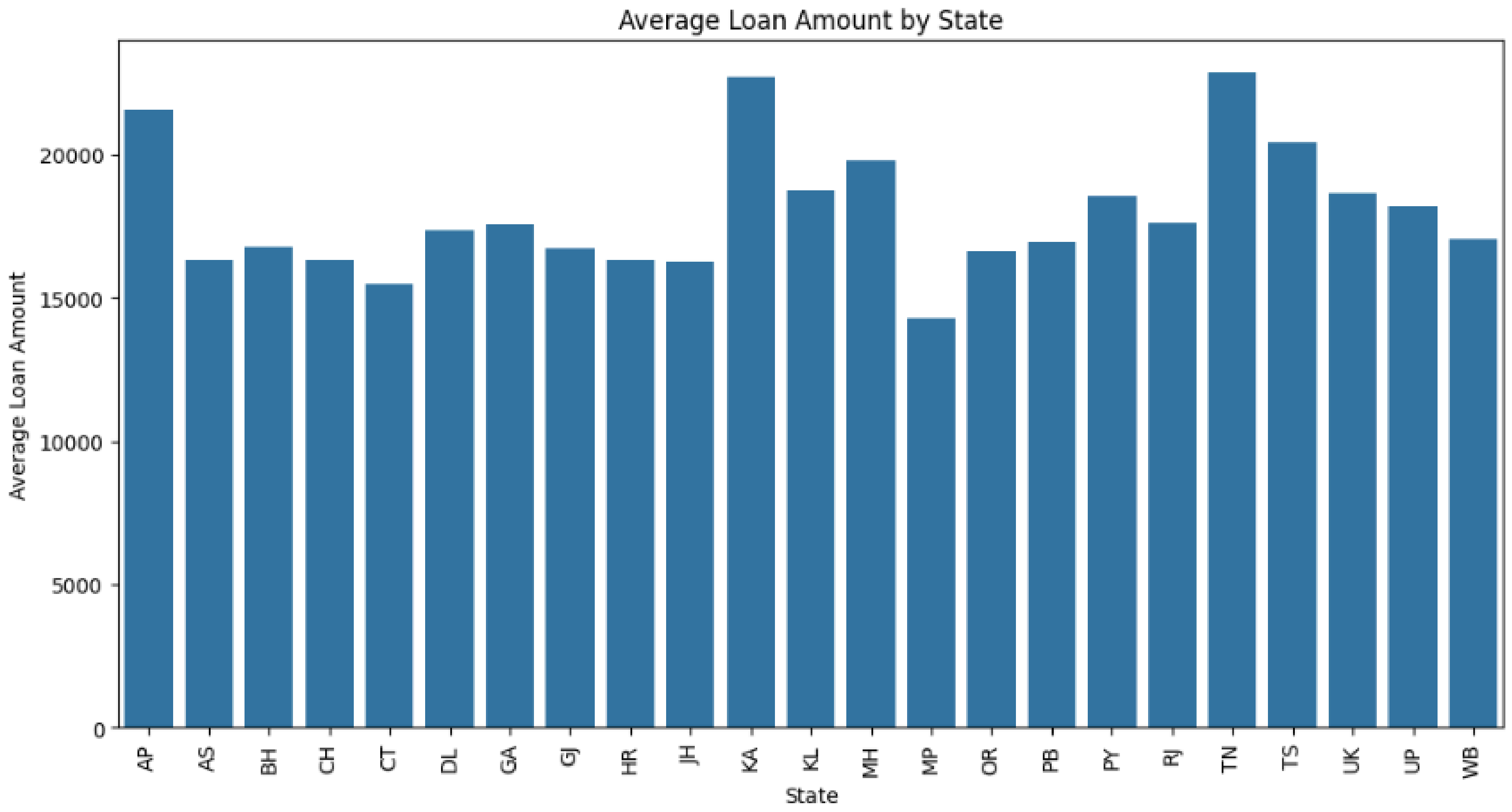
The distribution of Customer Lifetime Value (CLV) is highly skewed to the right, indicating that most customers have a lower lifetime value, while a small proportion contribute significantly higher CLV, suggesting that a major portion of revenue comes from these few customers. Additionally, the analysis of CLV against the total number of inquiries shows a negative trend, where higher-value customers tend to make fewer inquiries, implying that these customers are more decisive or less dependent on multiple inquiries before making a purchase or engaging in services.





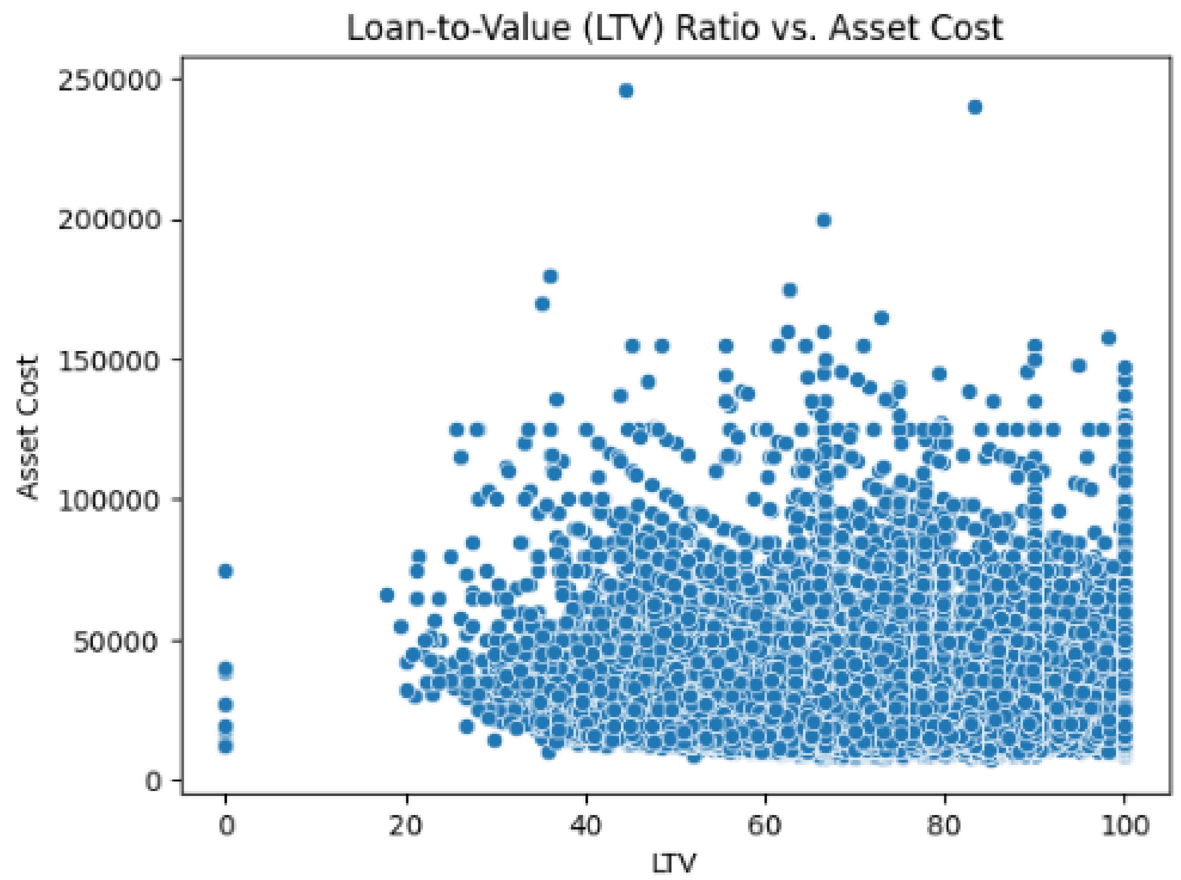
REGIONAL TREND ANALYSIS

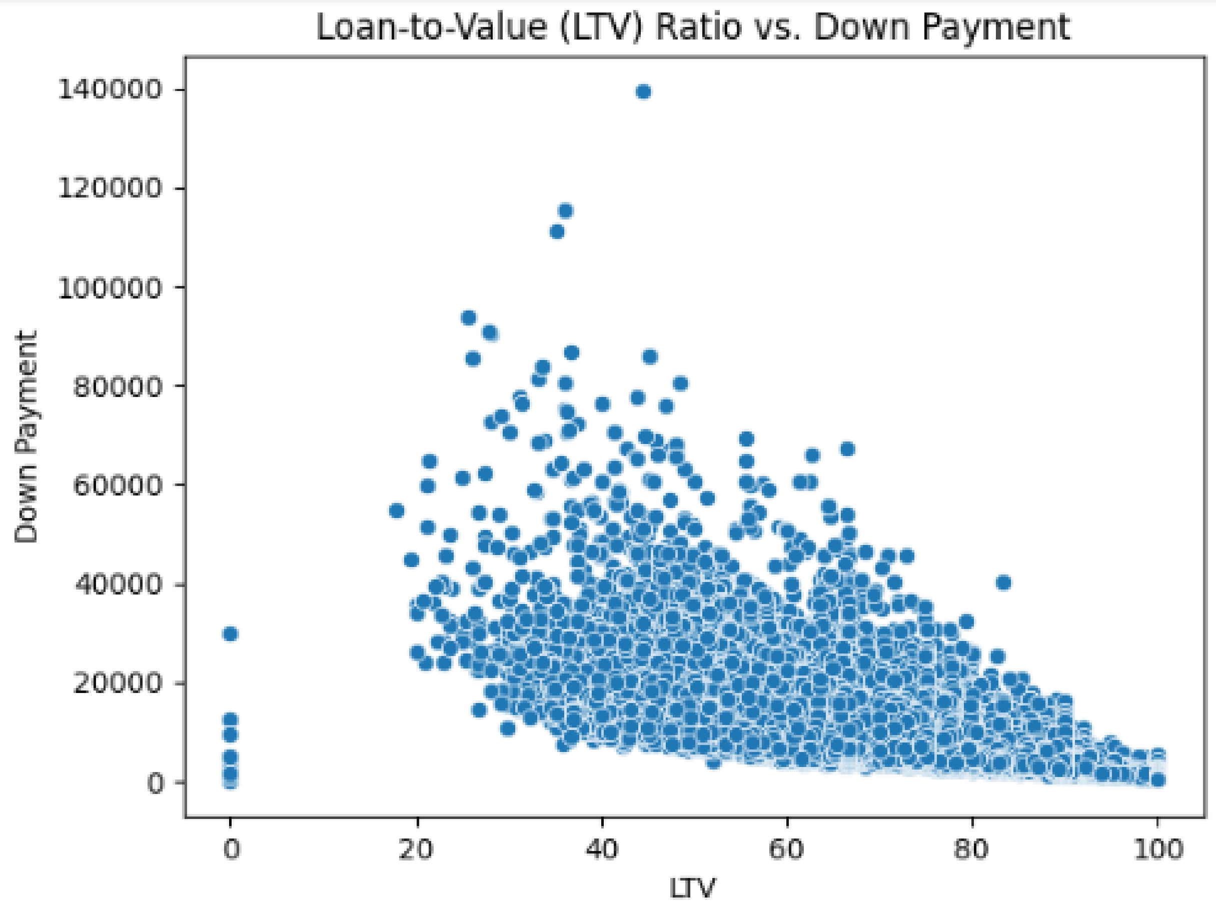
The average loan amount disbursed across different states. The data shows significant variation in loan amounts by state, with some states exhibiting higher average loan amounts than others. This suggests regional disparities in loan distribution, possibly influenced by local economic conditions, market demand, or the financial profiles of borrowers in each state. Identifying these trends can help in tailoring financial products and strategies to better meet regional needs.



LOAN-TO-VALUE ANALYSIS

The "Loan-to-Value (LTV) Analysis" slide presents two scatter plots. The first plot shows the relationship between the LTV ratio and asset cost, indicating that as the LTV ratio increases, the asset cost varies widely, with higher LTV ratios generally associated with lower asset costs. The second plot displays the LTV ratio against down payment amounts, revealing an inverse relationship; higher LTV ratios are typically linked to lower down payments. This analysis is crucial for understanding the risk profile of loans based on the LTV ratio.





MODEL : Random Forest Classification

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Accuracy: 0.97
Confusion Matrix:
[[    53   3572]
 [    32 109564]]
Classification Report:
              precision    recall  f1-score   support

        High       0.62      0.01      0.03      3625
         Low       0.97      1.00      0.98    109596

    accuracy                           0.97    113221
   macro avg       0.80      0.51      0.51    113221
weighted avg       0.96      0.97      0.95    113221
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THANKYOU!