

11/6/2025

Project Report

Project Title: “FinAI-EMI-Analyzer (EMIPredictAI)”

Domain: FinTech · Machine Learning · Credit Risk Assessment

Project Demo Link: <https://finai-emi-analyzer-p4tuvafh6a9tvuwvfwiqb.streamlit.app/>

Internship Project Under: LabMentix – DS / AIML Project Allocation Program

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1. Introduction

In today's lending systems, many people struggle with EMI repayment due to **poor financial planning** and **inaccurate loan eligibility assessment**. Traditional manual checks can be slow and inconsistent.

This project introduces **FinAI-EMI-Analyzer**, an **AI-powered financial decision-support system** that predicts:

1. **EMI Eligibility** (Eligible / High Risk / Not Eligible)
2. **Maximum Safe EMI Amount** a person can afford

The system uses **Machine Learning**, financial behavior analysis, and real-time user inputs to assist loan officers, banks, and credit platforms.

2. Objectives

- To automate EMI eligibility assessment using ML models.
 - To analyze customer income, expenses, liabilities, and credit score.
 - To provide risk-based financial insights for responsible lending.
 - To offer a **web-based tool** accessible via Streamlit Cloud.
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3. Dataset Details

Feature Category	Examples
Personal Info	Age, Education, Employment Type
Income & Expenses	Salary, Rent, Groceries, Travel, Fees
Financial Liabilities	Existing Loans, Current EMI
Banking Details	Credit Score, Balance, Emergency Fund
Loan Request	Requested Amount & Tenure

Total Records Used: **Dataset + Clean Subset**

File Used: emi_prediction_clean_subset.csv

4. Methodology

Step 1: Data Preprocessing

- Handled missing values
- Converted categorical to numeric encoding
- Scaled continuous features
- Engineered financial indicators:
 - **Debt-to-Income Ratio**
 - **Affordability Score**
 - **Savings Buffer Index**

Step 2: Model Training

Two ML tasks were developed:

Task	Model Used	Output
Classification	Logistic Regression / RandomForest / XGBoost	Eligible or Not
Regression	Linear Regression / RandomForestRegressor / XGBoostRegressor	Max EMI Amount (₹)

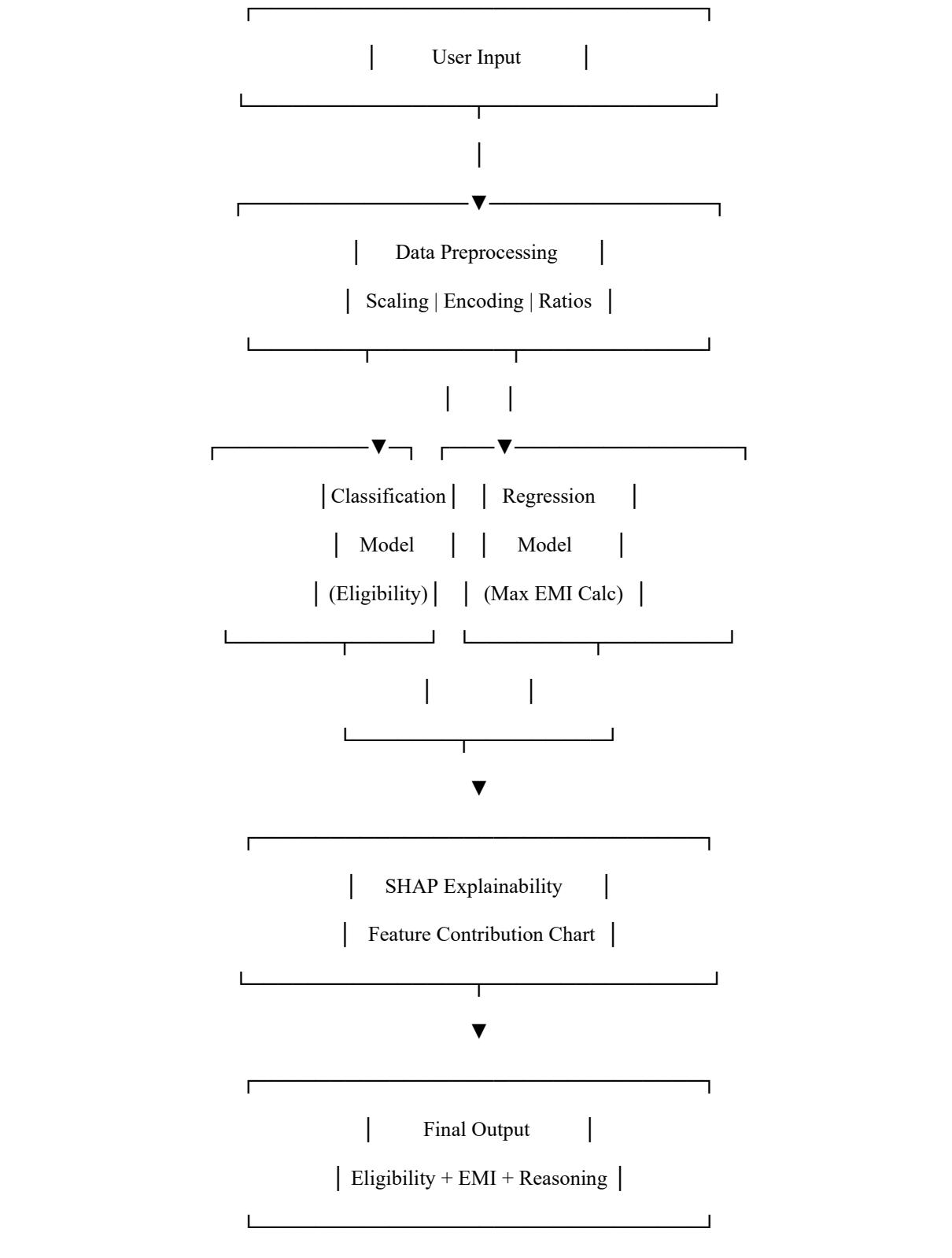
The **best-performing models** were saved as:

best_class_model.joblib and best_reg_model.joblib

Step 3: Web Deployment

- Built UI using **Streamlit**
- Model runs in real-time based on user inputs
- Deployed to **Streamlit Cloud** for public access

5. System Architecture



6. Results

- The system predicts **whether the applicant can safely repay EMI.**
 - The model provides **transparent financial reasoning** using SHAP.
 - Helps **reduce risk** and **promote responsible lending decisions.**
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7. Advantages

- ✓ Real-time EMI & risk evaluation
 - ✓ Reduces manual verification time
 - ✓ Transparent model interpretation
 - ✓ Works for multiple loan categories
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8. Conclusion

FinAI-EMI-Analyzer provides a **smart, accurate, and automated** loan eligibility evaluation system. It improves financial decision-making and reduces credit risk for both lenders and borrowers. The solution is **deployable, scalable**, and ready for integration with banking/fintech platforms.

9. Future Enhancements

- Mobile App Integration
- Multi-bank Interest Rate Comparison
- Integration with CIBIL API for live score retrieval