

Project Title: Loan Approval Prediction System Using ML Approach

Introduction/Problem Statement:

Traditional loan approval processes are often lengthy, costly, and labor-intensive, with limited certainty about the applicant's ability to repay the loan. This project addresses the need for an efficient, data-driven solution to streamline and improve the accuracy of loan approval decisions.

Objective:

The goal of this project is to design and develop a machine learning-based system that predicts loan approval eligibility, helping banks to quickly assess applicants and minimize risk. By creating an accessible platform, we aim to reduce the time and resources required for loan processing while improving decision accuracy.

Methodology:

Our solution employs a Random Forest Classifier model to evaluate key applicant attributes, such as income, age, and marital status, based on a dataset sourced from a hackathon organized by Univ.AI. The model is integrated into a user-friendly web interface where applicants can submit loan applications. It also features a XG-boost at the end for performance enhancements. The backend system processes these inputs, transforms categorical data into numerical values, and delivers approval predictions to both the bank and the applicant. Users can further submit the required documents directly for the bank verification, drastically **reducing the number** of frequent bank visits for a loan.

Results/Findings:

The system achieved a high performance with an ROC-AUC score of 0.97, and demonstrated strong accuracy in classifying loan approvals. The real-time display of results on the interface improved the efficiency of the application process, providing valuable insights to loan officers and enhancing customer experience.

Conclusion:

This project presents a robust machine learning solution for automating loan approvals, reducing processing times, and improving decision reliability for financial institutions. Future improvements could include integrating updated datasets and enhancing security features, making the system more adaptable to evolving financial data and lending criteria.