

**International Journal of
Engineering Research and Science & Technology**



ISSN : 2319-5991

www.ijerst.com

Email: editor@ijerst.com or editor.ijerst@gmail.com

LOAN STATUS PREDICTION SYSTEM

¹Mr. P China Babu, Assistant Professor, Department of Computer Science and Engineering, Ramachandra College of Engineering (A), affiliated to JNTUK Kakinada Eluru, Andhra Pradesh-521230, India

² G. Akhil, ³ K. Supriya, ⁴ K. Santosh Kumar, ⁵ Ch. Shiva

Department of Computer Science and Engineering, Ramachandra College of Engineering (A),

Affiliated to JNTUK Kakinada Eluru, Andhra Pradesh-521230, India

Abstract:

Banks are making major part of profits through loans. Though lot of people are applying for loans. It's hard to select the genuine applicant, who will repay the loan. While doing the process manually, lot of misconception may happen to select the genuine applicant. Therefore we are developing loan prediction system using machine learning. Leveraging a rich dataset encompassing historical loan records, the model incorporates crucial applicant features such as credit score, income, and employment history. Various machine learning algorithms, including logistic regression and decision trees, are employed and compared to optimize predictive accuracy. Our system aims to enhance lending institutions' decision-making processes by providing a reliable tool for forecasting loan outcomes. Through rigorous evaluation and validation, our developed model demonstrates predicting loan approval or rejection.

Keywords: Deep learning, streamlit, tensorflow, loan prediction.

1. Introduction:

In the rapidly evolving financial sector, the ability to predict loan approval accurately is crucial for both financial institutions and applicants. Traditional methods of assessing loan applications rely heavily on manual evaluations, which can be time-consuming and subject to human error. With the advancement of machine learning and artificial intelligence, there is an opportunity to enhance the efficiency and accuracy of these evaluations through automated systems.

This paper presents the development and implementation of a Loan Status Prediction System using Streamlit, a popular open-source app framework for data science and machine learning projects. The system integrates a deep learning model, trained to predict loan approval statuses based on various applicant and financial attributes.

The implementation of this system demonstrates the potential of integrating machine learning

models into financial services to enhance decision-making accuracy and efficiency. By automating the loan approval process, financial institutions can improve their operational efficiency, reduce the likelihood of human error, and offer a better customer experience.

2. Discussion:

The development and implementation of the Loan Status Prediction System provide significant insights into the practical application of machine learning and deep learning models in the financial services sector. This discussion explores several aspects of the system, including its architecture, methodology and the model.

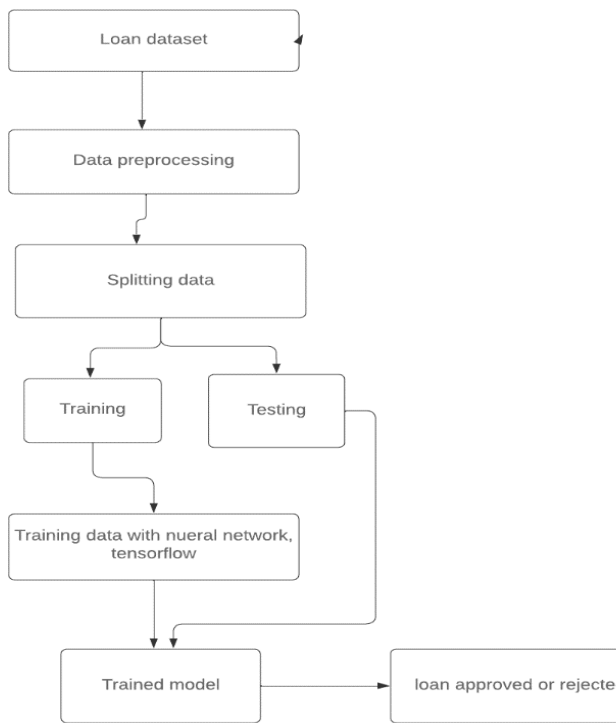


Fig 1: Architecture

Implementation:

Data collection:

The dataset for loan prediction was sourced from Kaggle. The set data generally consists of rows and columns, where each row represents an individual and each column represents a specific point.

Data Preprocessing:

Gathered a large, well- structured dataset containing applicable features for loan prediction. Preprocess the data by

Categorical Mapping: Encoding categorical features such as education level and employment status into numerical values to ensure compatibility with the machine learning model.

Data Scaling: Using StandardScaler to normalize the input features, which is crucial for maintaining the accuracy and consistency of the model's predictions.

Splitting the data:

The pre-processed data is splitting into training and testing data. Training Set contains 80% data. This larger portion of the data is used to train the machine learning models. The Testing Set contains 20% It is used latterly to evaluate the

model's performance on new data it has not encountered ahead.

User Interface:

Developed a user-friendly web interface using Streamlit to collect patient information from users. Integrated the trained DL model into the web operation to assay the entered data and provide a prediction.

Model:

Neural network models are used for various tasks like classification, regression, and pattern recognition. They can have different architectures, such as feedforward, convolutional, recurrent, or transformer networks, tailored to specific tasks and data types. TensorFlow, PyTorch, and Keras are popular frameworks for building and training neural network models. Here we used tensorflow framework.

TensorFlow is an open-source machine learning framework developed by Google Brain Team for building and training machine learning models, particularly neural networks.

TensorFlow supports a wide range of machine learning tasks, including classification, regression, clustering, reinforcement learning, and more. It has gained widespread adoption in both research and industry due to its flexibility, scalability, and extensive community support

3. Result:

The implementation of the Loan Status Prediction System has yielded promising results, demonstrating the potential of using deep learning models for financial decision-making processes. This section presents the key findings from the initial deployment and testing of the system.

The model appears to be learning effectively, as evidenced by the decreasing training loss and increasing training accuracy.

The fluctuations in validation accuracy and loss suggest that the model may be overfitting to the training data, meaning it is not generalizing well to the validation data.

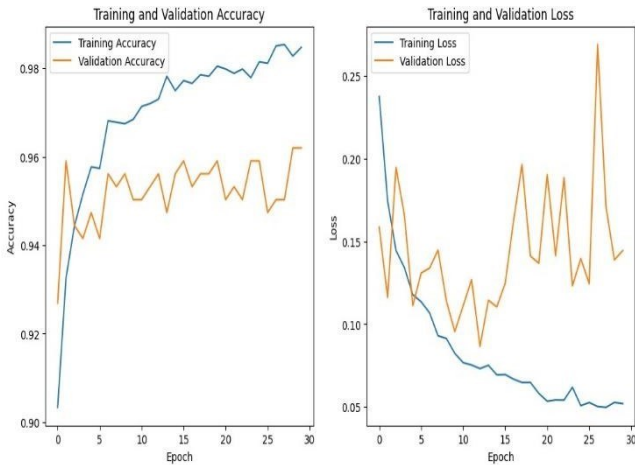


Fig 2 : Training and validation accuracy graph

The model shows a significant increase in accuracy during the early epochs, indicating effective initial learning. As training progresses, the improvements in accuracy become less pronounced, eventually stabilizing. The minor fluctuations in accuracy throughout the epochs suggest that the model is adjusting and fine-tuning its weights to find the best fit for the training data. Overall, the plot indicates that the model is effectively learning and improving its accuracy over time, with significant gains in the initial stages and gradual stabilization as it converges towards a higher accuracy level.

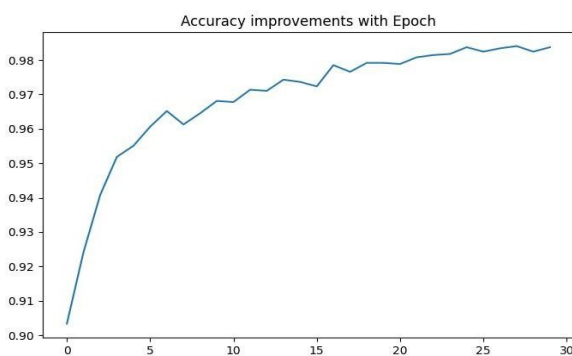


Fig 3 Accuracy graph

The performance metrics are as follows:

Accuracy: 95.73%

Loss: 0.1635

User interface:



Fig 4 home page

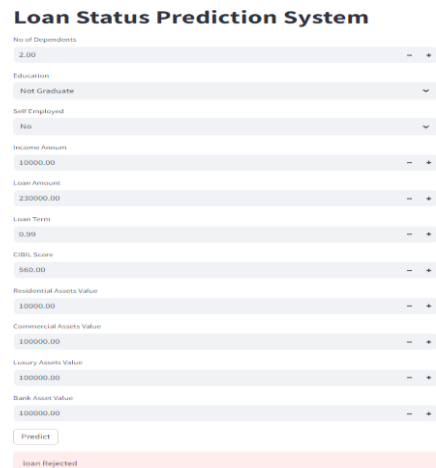


Fig 5 loan rejection

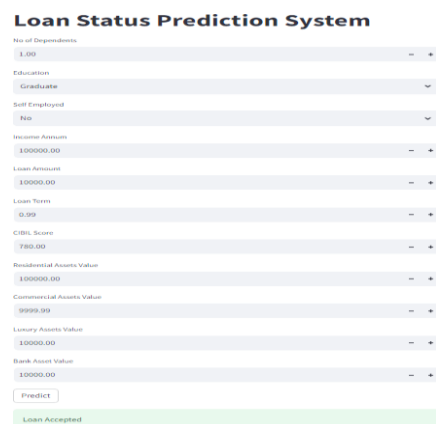


Fig 6 loan accepted

4. Conclusion:

Loan Status Prediction system provides a convenient way for users to assess the likelihood of their loan application being approved. It leverages machine learning to automate the decision-making process, potentially saving time for both loan applicants and lenders. However, it's essential to note that the predictions provided by the system are based solely on the input data and the trained model, and real-world loan approval decisions may involve additional factors and considerations.

5. References:

- [1]. S. Vimala, K.C. Sharmili, —Prediction of Loan Risk using NB and Support Vector Machinell, International Conference on Advancements in Computing Technologies (ICACT 2018), vol. 4, no. 2, pp. 110-113, 2018.
- [2]. Pidikiti Supriya, Myneedi Pavani, Nagarapu Saisushma, Namburi Vimala Kumari, K. Vikas, —Loan Prediction by using Machine Learning.
- [3]. X. Francis Jency, V.P.Sumathi, Janani Shiva Sri, —An Exploratory Data Analysis for Loan Prediction Based on Nature of the Clientsl, International Journal of Recent Technology and Engineering (IJRTE), Vol. 7, No. 48, pp. 176-179, 2018
- [4]. Anchal Goyal, Ranpreet Kaur, —Loan Prediction Using Ensemble Techniquell, International Journal of Advanced Research in Computer and Communication Engineering, Vol. 5, Issue 3, pp. 523 – 526, March 2016.
- [5]. Aboobyda Jafar Hamid and Tarig Mohammed Ahmed, —Developing Prediction Model of Loan Risk in Banks using Data Miningl, Machine Learning and Applications: An International Journal (MLAIJ), Vol.3, No.1, pp. 1-9, March 2016.
- [6] Arun, K., Ishan, G., & Sanmeet, K. (2016). Loan approval prediction based on machine learning approach. IOSR J. Comput. Eng, 18(3), 18-21.
- [7] Yasaswini, P., Arunasri, P., Pratyusha, Y., Reddy, P. S., & Kumari, S. Analysis and Forecasting of bank loan approval data using machine learning algorithms.