



## BANK LOAN MANAGEMENT

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**Abstract :** Banks play an integral role in the financial system of any country which directly affects its economic status and growth. The major roles of banks include accepting deposits from its customers, using those deposits to lend money to the borrowers in return for some interest, granting credits, discounting on bills etc. But the main source of profit for the banks is the interest it receives from lending money to the borrowers. And in a scenario of global pandemic like Covid-19, the number of people requiring financial aid from the banks has increased drastically. But a major problem faced by these banks is the failure of timely loan repayment by the borrowers. So, to tackle this problem, banks now a days use some models to predict the possibility of loan repayment from the borrower. Factors like annual income, employment status, home ownership, current debt etc are taken into consideration to categorize the loan request as bad loan or not. So, this paper basically aims to develop a similar model, but using ensemble machine learning algorithm of Random Forest Classification. And perform a comparative analysis with the model (Decision Tree Classification) that are currently in use. After complete implementation of all the models it was concluded that Random Forest Classifier Outperformed Decision Tree Classifier in terms of accuracy.

**IndexTerms - credit rating, Loan details, loan features, User details**

### I. INTRODUCTION

It is mainly used to provide loan to a deserving applicant out of all applicants. Artificial intelligence (AI), as a typical method for information investigation. An efficient system that reduces the bank's time. The Problem Statement are design and analysed in bank loan approval. A Loan Management System is a cutting-edge digital tool that uses AI to automate all stages of the loan life cycle. With this Financial Technology, you can replace traditional methods which are time-consuming and often require verification of applicants' credibility and financial information. Loans allow for growth in the overall money supply in an economy and open up competition by lending to new businesses. The interest and fees from loans are a primary source of revenue for many banks, as well as some retailers through the use of credit facilities and credit cards. Prediction of modernized loan approval system based on machine learning approach is a loan approval system from where we can know whether the loan will pass or not. In this system, we take some data from the user like his monthly income, marriage status, loan amount, loan duration, etc. Then the bank will decide according to its parameters whether the client will get the loan or not. So, there is a classification system, in this system, a training set is employed to make the model and the classifier may classify the data items into their appropriate class. A test dataset is created that trains the data and gives the appropriate result that, is the client potential and can repay the loan. Prediction of a modernized loan approval system is incredibly helpful for banks and also the clients. This system checks the candidate on his priority basis.

### II. MACHINE LEARNING ALGORITHM

In this paper we are using three Machine Learning algorithms which are used to find out the correct prediction of Data set.

- Random Forest** – Random forests is a classification algorithm which builds big number of Decision tree, whose prediction is more accurate than any of individual decision tree.
- Decision Tree** – A Decision tree split the dataset in to smaller parts. And then predict every chance.
- Logistic regression**- Predicts the output of a categorical dependent variable. Therefore, the outcome must be a categorical or discrete value. It can be either Yes or No, 0 or 1, true or False, etc. but instead of giving the exact value as 0 and 1, it gives the probabilistic values which lie between 0 and 1.

### III. RELATED WORK

#### Literature Work

- [1] Prediction of Loan Status using Machine Learning. It is mainly used in banking industry always needs a more accurate predicate modelling system. The purpose of the paper is predicting the loan status using machine learning technique.
- [2] Bank loan prediction system. The main objective of the work is to predict the bank loan of the applicants. The machine learning technique that will predict using customer data. This paper suggests solution to the classification problems of loan approval which is solved using machine learning. Classification technique
- [3] Prediction of modernized loan approval system. The number of applications is increasing every day for loan approval. Prediction for modernized loan approval system predicts the status using applicant data given. By studying the bank loan status approval prediction model trained using supervised machine learning.
- [4] A Review on Machine Learning Classification Technique for Bank Loan Approval. It is used to predict the loan approval status is to run on the machine learning calculation on the offered dataset to produce a trained model. The study examines the main role of the bank employee to approve the loan to applicant
- [5] Process in commercial loan application with ML. The Commercial loan application is financial instrument system is to predict the loan status for a applicant. This paper predicts the loan commercial loan application using machine learning
- [6] Research of the risk loan project of commercial bank the important source of risk that our commercial bank face is management of loan approval. This paper suggests the use of machine learning techniques to create a trained model to predict the loan approval
- [7] Loan prediction using machine learning. The major parts of profit in a bank is loan. Lot of people apply for loan the bank employee verify the background of the applicant to approval the loan it is time consuming process to avoid that a machine is trained using machine learning techniques
- [8] Survey paper towards the implementation of the loan management system This paper used for machine learning application to get a survey paper towards implementation of loan. This paper suggests use of machine learning in implementation of loan
- [9] This paper suggests use of machine learning in implementation of loan. It is mainly uses the ML algorithm to find the perfect accuracy to obtain the result. By studying and analyse the algorithm used in machine learning is to predict the bank loan risk
- [10] Developing a website for bank's ML based loan prediction system. The banking is service that is used by almost everyone of their financial status. The process takes many months are some more time. The paper mainly deals developing a website for bank based on ML.
- [11] Developing prediction model of loan risk in banks using ML. Prediction model is mainly used to predict the loan status using a applicant data given by customer. The paper deals with prediction
- [12] Real time Approval bank loan from lawyers' perspective In the lawyers point of view approval bank loan is more beneficially. The paper suggests about the lawyers point of view about bank loan
- [13] Loan Pricing model for credit risk The loan pricing model mainly used in service and support application. The first identity of the bank is loan The purpose of the paper is to loan pricing model for the end user
- [14] Prediction of defaulters using ML. The defaulters is main reason of this method of loan approval prediction. The paper suggests the prediction of defaulters using machine learning
- [15] Research on the risk evaluation in loan project of commercial bank in financial crisis. It is mainly used in loan project in commercial bank due to a financial crisis of applicant. It is mainly deals with evaluation in loan project of commercial bank for a specific applicant
- [16] Machine learning based model for prediction for loan approval. It mainly depends on decision making capability to evaluate risk lending of loan to the customer
- [17] Customer Loan eligibility prediction using ML algorithm in banking sector. Analyse the data based on integrate with machine learning techniques. [18] ML models for predicting bank loan eligibility ML models for predicting bank loan eligibility. This paper suggests that ML used in the fields including real-estate, security, financial industry.
- [18] ML models for predicting bank loan eligibility ML models for predicting bank loan eligibility. This paper suggests that ML used in the fields including real-estate, security, financial industry.

[19] Comparative analysis of customer loan approval prediction using a machine learning It mainly estimate the risk involved in a loan application and more challenges

[20] Credit evaluation of loan approval for Indian banks The banking is service that is used by almost everyone of their financial status .Theprocess takes many months are some more time

#### IV. TOOLS AND REQRIMENTS

- O/S: Windows 10
- Browser: Chrome Browser
- Colab (Google Colaboratory)
- Python Jupyter Notebook
- Python Libraries
- Streamlit
- Regression Algorithms
- Anaconda Navigator

#### V. PROPOSED SYSTEM

In this system, we are going to predict that the person who is applying for a loan can repay or not. If the client can repay then we predict that yes, eligible for a loan. And if the candidate fails then we predict that client is not eligible. The advantage of this system is that we provided some conditions by setting the algorithms and just by evaluating the details, we get to know eligibility criteria that client is eligible or not. This system may be built which is able to take various inputs from the users like monthly income ,education, loan amount, loan duration, etc and provide a prediction of whether their application will be approved by the bank or not.

We will design, develop and implement a Python based Classification predictionModel which will learn from the given training data and then predict the Loan Approval Status classification values for the provided Customer data.This solution will also enable the user to predict the Bank Loan Approval Status Classification based on the inputs provided by using a frontend

#### VI. METHODOLGY

In this study a predictive model for bank loan management using machine learning .The Algorithm requires input as pre-processed data .It reads and analyse pre-process the giving training data.To execute and verify the all- applicable algorithm on the dataset.To predict the bank loan approval status it uses the supervised machine learning technique

### VII. OUTPUT AND RESULT



Fig :1



Fig:2



Fig:3

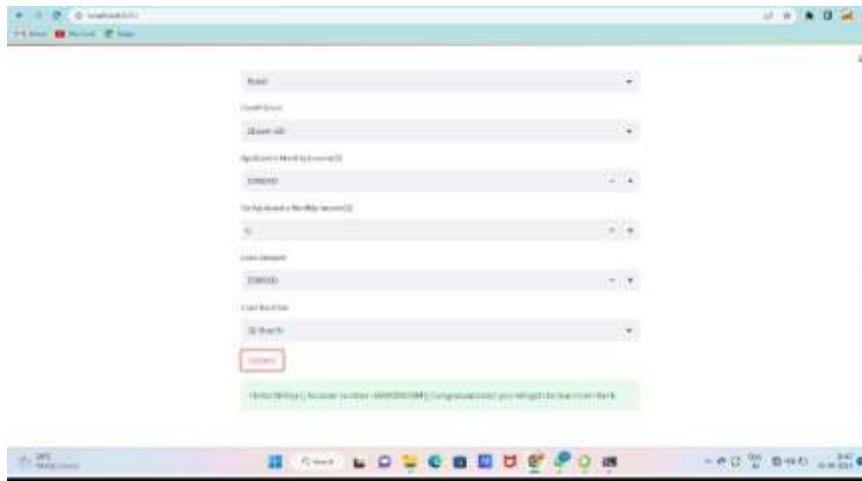


Fig:4



Fig:5

## VIII. CONCLUSION

This project has given us a valuable exposure to the Machine Learning, Supervised Learning, Classification and algorithms related to Classification. This project has also provided the experience of writing programs in Python Notebooks in the Google Colab environment. Further, we have learned Data Preprocessing activities and usage of classifier algorithms (Training of the algorithms using Training Data and predicting the classification values for the given customer data).

## IX. REFERENCES

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