

# Design And Implementation Of Prediction System For Bank Loan Approval

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**Abstract**— With the development in the banking sector, lots of people are applying for bank loans but the bank has its limited assets which it has to grant to limited people only. Finding out to whom the loan can be granted and which will be a safer option for the bank is a complex process and time consuming. In this paper, it reduces the risk factor by selecting the right person to save lots of bank efforts and assets. This is done by using analysis of the previous loan history of the applicant. On the basis of the previous loan history of the applicant. On the basis of the records/experiences, the machine will be trained using the machine learning technique, which will give the most accurate result.

**Index Terms**-Machine Learning, Bank Loan, Dataset, Prediction.

## I. INTRODUCTION

The core Business part of almost every bank is distribution of loans. The main portion of the bank's assets is directly from the profits gained by the loans it distributes. The prime objective in banking environment is to invest their assets in the safe hands. Nowadays, many banks / financial companies approve loan after a rigorous process of verification and validation of documents, but still there is no surety whether the chosen applicant is deserving or not. In this system we can predict whether the loan can be sanctioned or not and the whole process of prediction is automated, by using machine learning techniques.

## II. MACHINE LEARNING TECHNIQUES

Machine Learning is a subset of artificial intelligence, it involves scientific study of algorithms and statistical models that computer systems use to effectively perform a specific task without using explicit instructions, relying on patterns and inference instead.

Machine Learning Algorithms used:

### 1) Decision Tree:

It is a type of supervised machine learning. Here, the main aim is to create a model that predicts the value of target attribute by learning decision rules from the data features.

### 2) Random Forest:

It is a type of supervised machine learning. In simple, it is known as ensemble model where a number of decision trees combine to form a one random forest.

### 3) Neural Network:

Neural Networks can be thought as human brain, that are designed to recognize the patterns which may be in the form of numerical, and they also help to group the unlabelled data according to the similarities found in the training data.

## III. DATASET

The machine learning models is trained based on the attributes in the dataset. When the user enters the input the data is taken as test dataset and the output is predicted based on training dataset.

SL NO.	Attribute	Type
1	First_name	Char
2	Last_name	Char
3	Gender	Char
4	DOB	Date
5	Adhaar_card number	Int
6	Graduate_or_not	Int
7	Experience	Int
8	Home_ownership	Int
9	Dependents	Int
10	Purpose	Int
11	Application_type	Int
12	Applicant_income	Float
13	Applicant_credit_score	Int
14	Co_applicant_income	Float
15	Co_applicant_credit_score	Int
16	Loan_amt	Float
17	Term	Int
18	Interest_rate	Float
19	installment	Float

Table.1

**IV. METHODOLOGY**

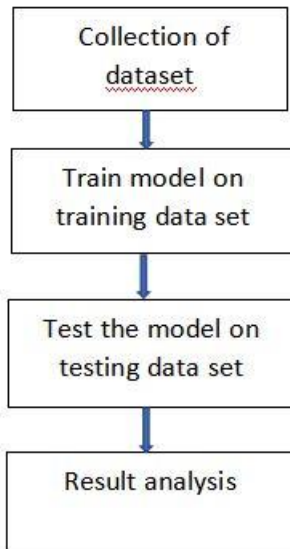


Figure.1

**V. SYSTEM DESIGN**

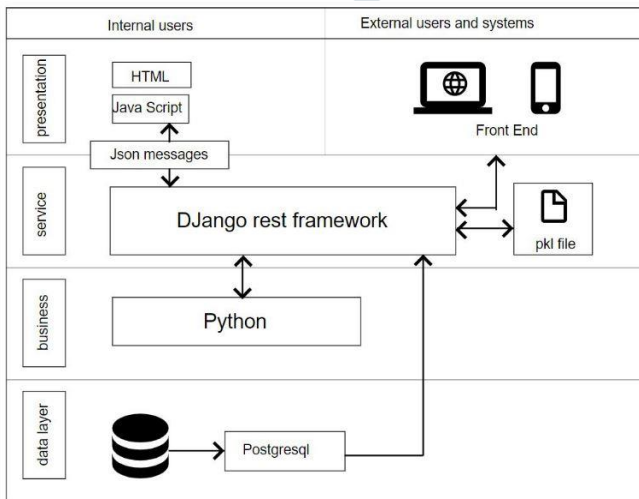


Figure.2

This system follows supervised learning technique. Initially when the application is started, the pickle file(it is used to serialize and de-serialize the data) is generated. The machine learning models get trained simultaneously and the application is ready to accept the input data and predict the results. The user enters the data in the front-end, the data is converted into JSON messages and sent to Django Restframework. The restframework communicates with the database to predict the output based on the training experience. The predicted output is communicated through front-end to the user.

**VI. RESULTS**



Figure.3

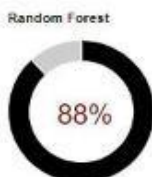


Figure.4

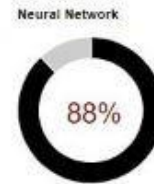


Figure.5

Figure 3 is the predicted output produced by Decision Tree. Figure 4 is the predicted output produced by Random Forest. Figure 5 is the predicted output produced by Neural Network.

**VII. CONCLUSION AND FUTURE WORK**

It is concluded that the above three models are implemented correctly and the predicted outputs are accurate as per our knowledge. It can be implemented in bank sectors or in financial services. In future other machine learning models can be implemented.

**VIII. REFERENCES**

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