

## Loan Approval Prediction using Machine Learning

Indur Ranaveer<sup>1</sup>, B. Sampath Kumar<sup>2</sup>, Pyata Hemalatha<sup>3</sup>, \*A Sravani<sup>4</sup>

<sup>1,2</sup>Assistant Professor, CMR Institute of Technology, Medchal, Telangana

<sup>3</sup>Assistant Professor, Narasimha Reddy Engineering College, Kompally, Telangana

<sup>4</sup>Assistant Professor, St. Martin's Engineering College, Secunderabad, Telangana-500100

Email: [asravaniit@smec.ac.in](mailto:asravaniit@smec.ac.in)

### ABSTRACT

The goal of this project is to predict a Machine Learning based Loan Application Prediction on Dream Housing Finance Company. They have a presence across all urban, semi urban and rural areas. The customer first applies for a home loan and after that, the company validates the customer eligibility for the loan. The company wants to automate the loan eligibility process based on customer detail provided while filling out online application forms. These details are Gender, Marital Status, Education, and number of Dependents, Income, Loan Amount, Credit History, and others. To automate this process, they have provided a dataset to identify the customer segments that are eligible for loan amounts so that they can specifically target these customers. In this we are using decision tree algorithm to implement this.

**Keywords:** Machine learning, Loan, Decision tree.

### I. INTRODUCTION

A loan is the core business part of banks. The main portion the bank's profit is directly come from the profit earned from the loans. Though bank approves loan after a regress process of verification and testimonial but still there's no surety whether the chosen hopeful is the right hopeful or not. This process takes fresh time while doing it manually. We can prophesy whether that particular hopeful is safe or not and the whole process of testimonial is automated by machine literacy style. Loan Prognostic is really helpful for retainer of banks as well as for the hopeful also.

### II. EXISTING SYSTEM

Bank employees check the details of applicant manually and give the loan to eligible applicant. Checking the details of all applicants takes lot of time. The artificial neural network model for predict the credit risk of a bank. The Feed- forward back propagation neural network is used to forecast the credit default. The method in which two or more classifiers are combined together to produce an ensemble model for the better prediction. They used the bagging and boosting techniques and then used random forest technique. The process of classifiers is to improve the performance of the data and it gives better efficiency. In this work, the authors describe various ensemble techniques for binary classification and also for multi class classification. The new technique that is described by the authors for ensemble is COB which gives effective performance of classification but it also compromised with noise and outlier data of classification. Finally, they concluded that the ensemble based algorithm improves the results for training data set.

#### Drawback of Existing System

Checking details of all applicants consumes lot of time and efforts. There is chances of human error may occur due checking all details manually. There is possibility of assigning loan to ineligible applicant.

### III. PROPOSED SYSTEM

To deal with the problem, we developed automatic loan prediction using machine learning techniques. We will train the machine with previous dataset. so machine can analyse and understand the process. Then machine will check for eligible applicant and give us result.

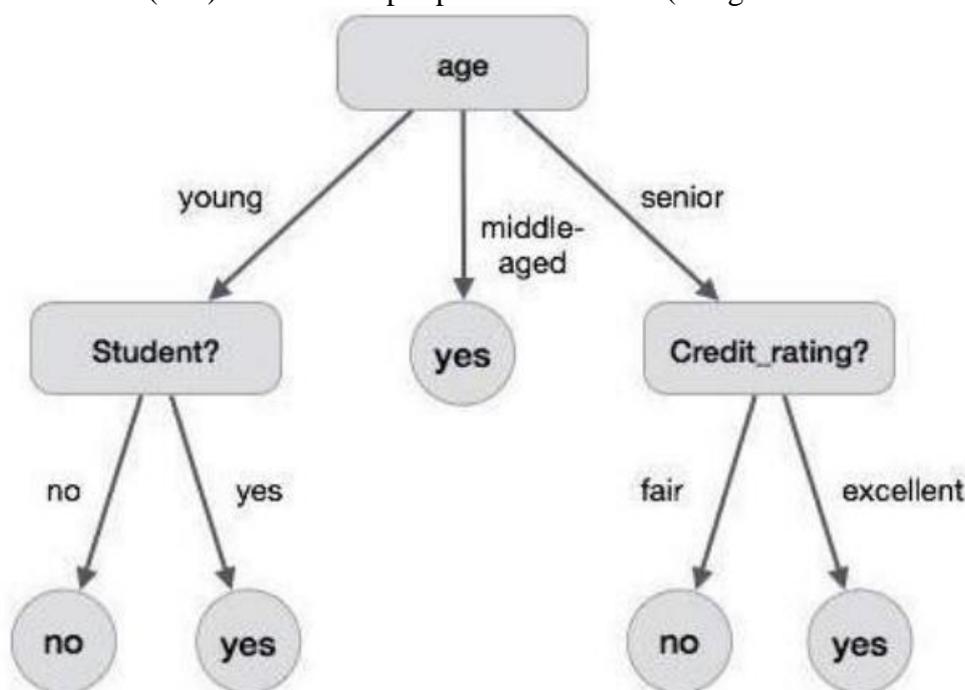
Advantages

- Time period for loan sanctioning will be reduced.
- Whole process will be automated, so human error will be avoided
- Eligible applicant will be sanctioned loan without any delay.

### IV. ARCHITECTURE TECHNIQUES

Decision Tree

Decision tree algorithm in machine erudition how's which efficiently performs both family and retrogression tasks. It creates decision trees. Decision trees are universally used in the banking assiduosity due to their high exactitude and capableness to formulate a statistical model in plain language. In Decision tree each knot represents a criterion (diagnostic), each link (branch) represents a decision (rule) and each chip represents an outce (categorical or continues value).



### V. IMPLEMENTATION METHODOLOGY

Data Collection:

The dataset collected for foretelling loan failure clients is foretold into Training set and testing set. Generally, 8020 proportion is applied to dissociate the training set and testing set. The data model which was created using Decision tree is applied on the training set and hung on the test take fineness, Test set forecasting is done.

Preprocessing:

The collected data may contain missing values that may lead to inconsistency. To gain better results data need to be preprocessed and so it'll better the effectiveness of the algorithm. We should remove the outliers and we need to convert the variables. In order to flooring these issues we use chart function.

Train model on training data set:

Now we should train the model on the training dataset and make soothsayings for the test dataset. We can divide our train dataset into two tract train and testimony. We can train the model on this training part and using that make soothsayings for the testimony part. In this

way, we can validate our soothsayings as we've the true soothsayings for the testimony part (which we don't have for the test dataset)

Correlating attributes:

Grounded on the correlation among attributes it was observed more likely to pay back their loans. The attributes that are individual and significant can include Property area, education, loan measure, and originally credit History, which is since by insight it's considered as important. The correlation among attributes can be associated using corplot and boxplot in Python platform

Decision Tree:

Decision tree is a type of supervised education algorithm (having a pre- defined target variable) that is generally used in category problems. In this approach, we disassociate the population or sample into two or added homogeneous sets (or sub-populations) based on the most significant splitter/ differentiator in input variables.

Decision trees use multiple algorithms to decide to disunite a bump into two or added sub-knots. The creation of sub- knots increases the unsophistication of attendant sub- knots. In other words, we can say that chasteness of the bump increases with respect to the target variable.

Predicting the outcomes:

Using decision tree algorithm, the outcomes of all applicant can be stored in any file.

Algorithm:

1. Import all the required python modules
2. Import the database for both TESTING and TRAINING.
3. Check any NULLVALUES are exists
4. If NULLVALUES exits ,fill the table with corresponding coding
5. Exploratory Data Analysis for all ATTRIBUTES from the table
6. Plot all graphs using MATPLOTLIB module
7. Build the DECISIONTREE MODEL for the coding
8. Send that output to CSV FILE

## **VI. RESULTS**

	A	B	C
1		Loan_ID	Loan_Status
2	0	LP001015	Y
3	1	LP001022	Y
4	2	LP001031	Y
5	3	LP001035	N
6	4	LP001051	Y
7	5	LP001054	N
8	6	LP001055	Y
9	7	LP001056	N
10	8	LP001059	Y
11	9	LP001067	Y
12	10	LP001078	N
13	11	LP001082	Y
14	12	LP001083	Y
15	13	LP001094	N
16	14	LP001096	Y
17	15	LP001099	Y
18	16	LP001105	N
19	17	LP001107	Y
20	18	LP001108	Y
21	19	LP001115	N
22	20	LP001121	Y
23	21	LP001124	Y
24	22	LP001128	Y
25	23	LP001135	Y
26	24	LP001149	N

## VII. CONCLUSION

From a proper analysis of positive points and constraints on the member, it can be safely concluded that the product is a considerably productive member. This use is working duly and meeting to all Banker requisites. This member can be freely plugged in numerous other systems. There have been mathematics cases of computer glitches, violations in content and most important weight of features is fixed in automated prophecy system, so in the near future the so – called software could be made more secure, trustworthy and dynamic weight conformation. In near future this module of prophecy can be integrated with the module of automated processing system. The system is trained on old training dataset in future software can be made resembling that new testing date should also take part in training data after some fix time.

## VIII. REFERENCES

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