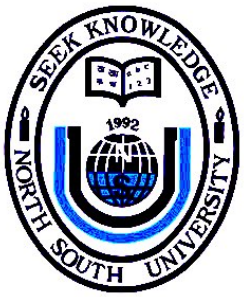
Department of Electrical and Computer Engineering
North South University



Senior Design Project

Loan Defaulter Prediction System using Machine Learning

Mushayev Masrur **ID# 1511122042**
Ibrahim Khalil **ID# 1510831042**
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Faculty Advisor:

A.K.M. Bahalul Haque

Lecturer, ECE Department

Fall 2019

Cover Letter

Date: 27/12/2019

To,

A.K.M. Bahalul Haque,

Lecturer,

Department of Electrical and Computer Engineering

North South University

Plot, 15, Block B Kuril - NSU Rd, Dhaka 1229

Dear Sir,

With due respect, we are submitting a manuscript for consideration for publication in *Computers*. The manuscript is entitled "Loan Defaulter Prediction System using Machine Learning".

It has not been published elsewhere and that it has not been submitted simultaneously for publication elsewhere.

Predicting the bad loans is important to be known by the banks and financial companies. This kind of analysis can be easily carried out with the help of Machine Learning. Several input factors such as limit, duration, interest rate, annual income, loan code, Installment and Non-Performing Loan (NPL) are taken in consideration to and the output, which is the binary representation of a loan holder being defaulter or not, is predicted. For this to happen, classification techniques are very much useful. In the given paper, we have been using three different types of classification models, Logistic Regression, Support Vector Machine (SVM), Decision Tree and Random Forest. All these models will show us the impacts of different parameters in the rate of production. These four models can be used both as the fundamentals of predicting the production of any crop, and also can be used other classification model techniques.

Thank you very much for your consideration.

Yours Sincerely,

Mushayev Masrur

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APPROVAL

The capstone project entitled **"Loan Defaulter Prediction System using Machine Learning"** by Mushayev Masrur (ID#1511122042), Ibrahim Khalil (ID#1510831042), Md. Tousif Rob Choudhury (ID#1511387642) and Md. Muhibul Hasan (ID#1531022642) is approved in partial fulfillment of the requirement of the Degree of Bachelor of Science in Computer Science and Engineering on December, 2019 and has been accepted as satisfactory.

Supervisor:

A. K. M. Bahalul Haque

Lecturer

Department of Electrical and Computer Engineering

North South University

Dhaka, Bangladesh.

Department Chair:

Dr. Mohammad Rezaul Bari

Associate Professor & Chairman

Department of Electrical and Computer Engineering

North South University

Dhaka, Bangladesh.

DECLARATION

This is our truthful declaration that the **"Capstone Project Report"** we have prepared is not a copy of any **"Capstone Project Report"** previously made by any other team. We also express our honest confirmation in support of the fact that the said **"Capstone Project Report"** has neither been used before to fulfill any other course related purpose nor it will be submitted to any other team or authority in future.

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ACKNOWLEDGEMENT

First of all, we wish to express our gratitude to the Almighty for giving us the strength to perform our responsibilities and complete the report.

The capstone project program is very helpful to bridge the gap between the theoretical knowledge and real-life experience as part of Bachelor of Science (BSc) program. This report has been designed to have a practical experience through the theoretical understanding.

We also acknowledge our profound sense of gratitude to all the teachers who have been instrumental for providing us the technical knowledge and moral support to complete the project with full understanding.

We would like to convey our gratitude to our faculty **A.K.M Bahalul Haque** for his stimulating inspiration, kind guidance, valuable suggestions, sagacious advice and kind co-operation throughout the period of word undertaken, which has been instrumented in the success of our project. At this level of understanding it is often difficult to understand the wide spectrum of knowledge without proper guidance and advice. His suggestions & guidance have made the report a good manner.

We thank our friends and family for their moral support to carve out this project and always offer their support.

ABSTRACT

With the growth in banking sector lots of people and companies are applying for bank loans but the banks have their limited assets which they have to grant which will be a safer option for the banks is a difficult process. So, in this paper we try to reduce these risk factor/s of the banks to select a particular person or a company for providing loans. This is done by analyzing the data of the previous records of the people to whom the loan was granted before and on the basis of these records/experiences the system will be trained using the machine learning model which gives the most accurate result. The main objective of this project is to predict whether assigning the loan to particular person/company will be safe or not. This will be done by finding out the chances of a loan seeker being a defaulter or not. To achieve the maximum limit of the goal, applying classification models is the most efficient way. In this particular research, the three most popular and useful models; Logistic Regression, Random Forest, Decision Tree and Support Vector Machine are being implemented. Simultaneously, users who are also the bank personnel, can also have an access to a User Interface which is discussed in this paper as well. The UI will allow the users to input data for new loan seekers, so that the banks can predict the output for a loan seeker being defaulter or not in the form of binary output.