IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 9, Issue 7, July 2021

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.542

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 7.542 |

|| Volume 9, Issue 7, July 2021 ||

| DOI: 10.15680/IJIRCCE.2021.0907016 |

Student Grade Predictor Using Machine Learning

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ABSTRACT: Prediction of student's performance became an urgent desire in most of educational entities and institutes. That is essential in order to help at-risk students and assure their retention, providing the excellent learning resources and experience, and improving the university's ranking and reputation. However, that might be difficult to be achieved for startup to mid-sized universities, especially those which are specialized in graduate and post graduate programs and have small students' records for analysis.

So, the main aim of this project is to prove the possibility of training and modeling a small dataset size and the feasibility of creating a prediction model with credible accuracy rate. This research explores the possibility as well of identifying the key indicators in the small dataset, which will be utilized in creating the prediction model, using visualization, and clustering algorithms. Best indicators were fed into multiple machine learning algorithms to evaluate them for the most accurate model.

Among the selected algorithms, the results proved the ability of clustering algorithm in identifying key indicators in small datasets. The main outcomes of this study have proved the efficiency of support vector machine and learning discriminant analysis algorithms in training small dataset size and in producing an acceptable classification's accuracy and reliability test rates.

I.INTRODUCTION

Machine learning is a branch of artificial intelligence that aims at solving real life engineering problems. It provides the opportunity to learn without being explicitly programmed and it is based on the concept of learning from data. It is so much ubiquitously used dozen a times a day that we may not even know it.A complex algorithm or source code is built into a computer that allows for the machine to identify data and build predictions around the data that it identifies.

Decision Trees are a type of Supervised Machine Learning (that is you explain what the input is and what the corresponding output is in the training data) where the data is continuously split according to a certain parameter. The tree can be explained by two entities, namely decision nodes and leaves. The leaves are the decisions or the final outcomes. And the decision nodes are where the data is split.

Linear Regression is a machine learning algorithm based on supervised learning. It performs a regression task.Regression models a target prediction value based on independent variables. It is mostly used for finding out the relationship between variables and forecasting. Different regression models differ based on – the kind of relationship between dependent and independent variables, they are considering, and the number of independent variables being used.

K-Nearest Neighbour is one of the simplest Machine Learning algorithms based on Supervised Learning technique.K-NN algorithm assumes the similarity between the new case/data and available cases and put the new case into the category that is most like the available categories.K-NN algorithm stores all the available data and classifies a new data point based on the similarity. This means when new data appears then it can be easily classified into a well suite category by using K- NN algorithm.K-NN algorithm can be used for Regression as well as for Classification but mostly it is used for the

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Classification problems.

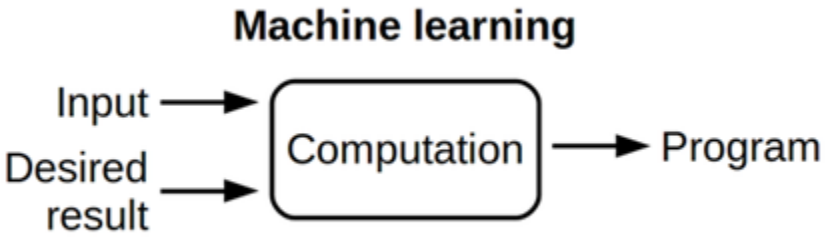

Figure 1 : Machine Learning

RELATED WORK

In the existing projects they have used lots of input attributes like age, parent qualifications, student study hours, Mjob, Fjob, previous marks etc.,

age	student's age (numeric: from 15 to 22)
school	student's school (binary: *Gabriel Pereira* or *Mousinho da Silveira*)
address	student's home address type (binary: urban or rural)
Pstatus	parent's cohabitation status (binary: living together or apart)
Medu	mother's education (numeric: from 0 to 4[a])
Mjob	mother's job (nominal[b])
Fedu	father's education (numeric: from 0 to 4[a])
Fjob	father's job (nominal[b])
guardian	student's guardian (nominal: mother, father or other)
famsize	family size (binary: ≤ 3 or > 3)
famrel	quality of family relationships (numeric: from 1 – very bad to 5 – excellent)
reason	reason to choose this school (nominal: close to home, school reputation, course preference or other)
traveltime	home to school travel time (numeric: 1 – < 15 min., 2 – 15 to 30 min., 3 – 30 min. to 1 hour or 4 – > 1 hour).
studytime	weekly study time (numeric: 1 – < 2 hours, 2 – 2 to 5 hours, 3 – 5 to 10 hours or 4 – > 10 hours)
failures	number of past class failures (numeric: n if $1 \leq n < 3$, else 4)
schoolsup	extra educational school support (binary: yes or no)
famsup	family educational support (binary: yes or no)
activities	extra-curricular activities (binary: yes or no)
paidclass	extra paid classes (binary: yes or no)
internet	Internet access at home (binary: yes or no)
nursery	attended nursery school (binary: yes or no)
higher	wants to take higher education (binary: yes or no)

Figure 2: Existing System

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III.PROPOSED SYSTEM

In this work we used only Mid1,Mid2 and subject as the input data for the prediction of the student final grade. By using only these attributes we work hard to give maximum accuracy.

Attributes:

Mid1
Mid2
Subject

Figure 3: Proposed System

ARCHITECTURAL DESIGN

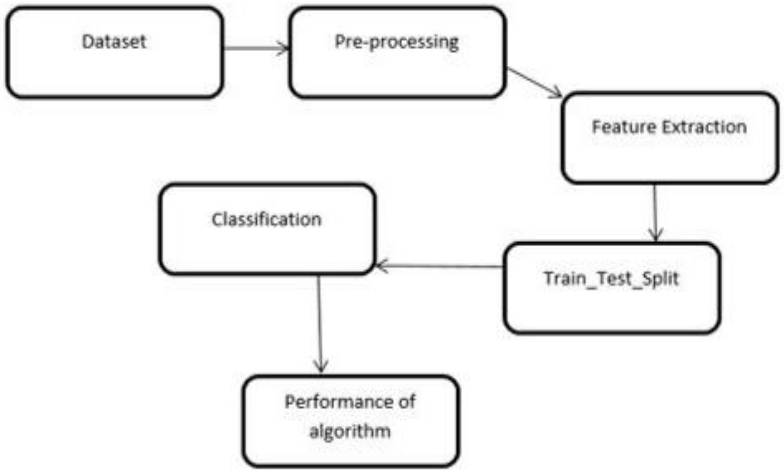

Figure 4:Architectural Design

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1.Dataset
2.Pre-processing
3.feature Extraction
4.Train_Test_Split
5.Classification
6.Performance of algorithm
7.Predictionof Grade

IV.RESULTS

Figure 4: Valid Input

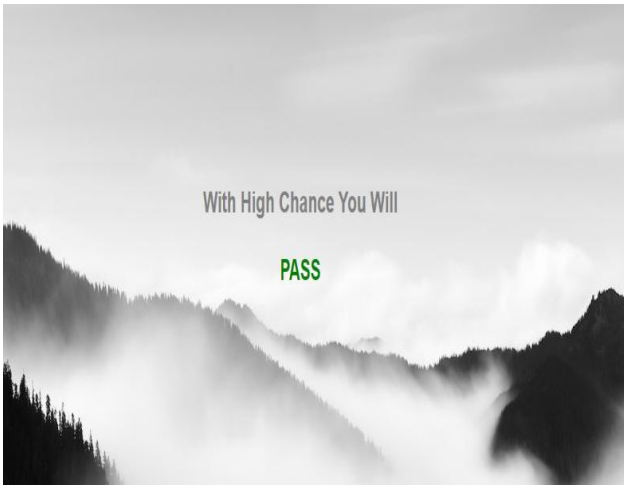

Figure 5: Output 1

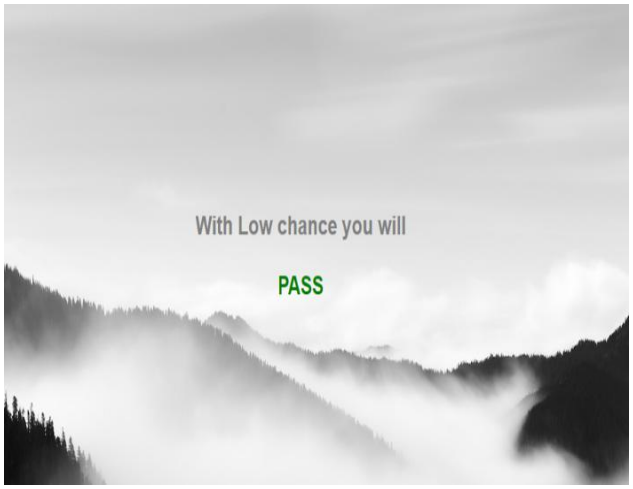

Figure 6: Output 2

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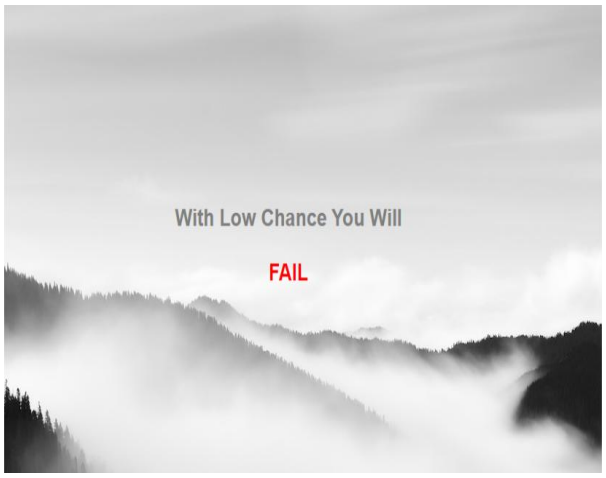

Figure 7: Output 3

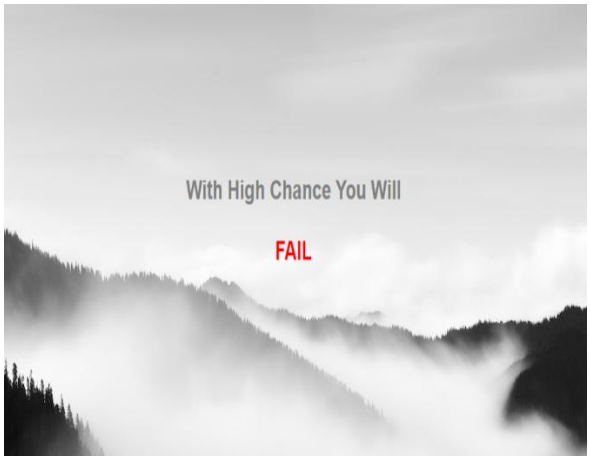

Figure 8: Output 4

If we enter the invalid data,then we will redirect to login page.

Figure 9:Invalid Input

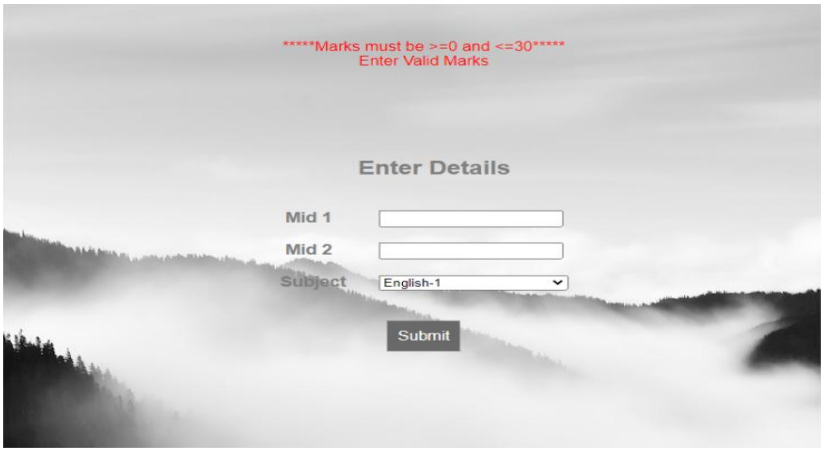

Figure 10:Output for Invalid data

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V.CONCLUSION

- Our project focuses on the student grade prediction using machine learning techniques.
- For analysis, logical regression, Decision tree and KNN classifier are used.
- Our main motive is to help students to know their capabilities and also their weaknesses so that they can make use of those capabilities and work even more on them to get great opportunities and also to make them know their weaknesses so that they can strive hard to overcome them and then achieve their expected scores.
- College can also use this to know how many students are going to pass and how many students are going to fail so that they can prepare students according to their score and category.
- In future additional features are added to our dataset to acquire better accuracy.

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Impact Factor: 7.542

doi cross ref

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

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