

# Student Performance Predicting And Making Growth Analysis System

Shubham Choudhari

Insha Aahmed

Ujwal Kachh

Priyanka Khobe

Prof. Dr. Punam U. Chati

Department of Electronics and Telecommunication, Rashtrasant Tukdoji Maharaj Nagpur University (RTMNU)  
Priyadarshini College of Engineering, Hingna,,Nagpur,India

**Abstract** - Main objective of the educational institutions is to give high quality education to its students and provide complete IT professionals to the market. One way to improve quality in higher education system is by discovering patterns for prediction about the enrollment of students in a particular program, prediction about students' performance and so on. On the other hand it is also important to choose appropriate field for student at enrolment time. Advertise in the area where the education about particular program not well known. Knowledge Discovery in databases and Data Mining techniques can be used for extracting useful knowledge from data. In this research, the association rule mining technique is used to find hidden patterns and evaluate students' performance and trends. Aproprate algorithm is used for finding associations among attributes. The system efficiency has been tested upon the data of students.

**Keywords** - Student performance; student analysis; datamining; student performance analysis.

**INTRODUCTION:** The economic success of any country highly depends on making higher education more affordable and that considers one of the main concerns for any government. One of the factors that contributes to the educational expenses is the studying time spent by students in order to graduate. For example, the loan debt of the American students has been increased due to the failure of many students in getting graduated on time. [A]. Higher education is provided for free to the students in India by the government. Yet, failing of graduating on time costs the government extra expenses. To avoid these expenses, the government has to ensure that the student graduate on time. Machine learning techniques can be used to forecast the performance of the students and identifying the at risk students as early as possible so appropriate actions can be taken to enhance their performance. One of the most important steps when using these techniques is choosing the attributes or the descriptive features which used as input to the machine learning algorithm. The attributes can be categorized into GPA and grades, demographics, psychological profile, cultural, academic progress, and educational background. [B]. This research introduces two new attributes that focus on to the effect of using the internet as a learning resource and the effect of the time spent by students on social networks on the students' performance. Four machine learning techniques, fully connected feed forward Artificial Neural Network, Naïve Bayes, Decision Tree, and Logistic Regression, have been used to build the machine learning model. ROC index has been used to compare the accuracy of the four models. The dataset used to build the models is collected from the students at the College Of Humanities during 2018 and 2019 academic years using a survey and the student's grade book. The dataset has the information of 161 students. The activities of this research include feature engineering to create the students dataset, data collecting, data preprocessing, creating and evaluating four machine learning models, and finding the best model and analyzing the results.

**LITERATURE SURVEY:** A background study is done to review similar existing systems used to perform student performance analysis. Three existing system are chosen because these systems are similar to the proposed system. [A]. Faculty Support System (FSS). Shana and Venkatacalam has proposed a framework named Faculty Support System (FSS) which is low in cost as it uses cost effective open source analysis software, WEKA to analyse the students' performance in a course offered by Coimbatore Institute of Technology of Anna University. FSS is able to analyse the students' data dynamically as it is able to update of students' data dynamically with the flow of time to create or add a new rule. The update of new rule

possible with the help from domain expert and the rule is determined by data mining technique such as classification technique. Classification technique is used to predict the students' performance. Besides, FSS focus on the identification of factors that contribute to

performance of students in a particular course. [B]. Student Performance Analyser (SPA). SPA is existing secure online web-based software that enables educators to view the students' performance and keep track of the school's data. The SPA is a tool designed for analysing,

displaying, storing, and getting feedback of student assessment data. It is a powerful analyser tool used by schools worldwide to perform analysis and displays the analysis data once raw student data is uploaded to the system. The analysis is done by tracking the student or class to get the overall performance of student or class. It helps to identify the students' performance which is below the expected level, at expected level or above the expected level. This would allow the educators or staffs to identify the current students' performance easily. Other than that, it enables various kinds of students' performance report such as progress report and achievement report to be generated. [C]. Intelligent Mining and Decision Support System(InMinds) InMinds helps University Malaysia Sarawak (UNIMAS) to monitor the performance of various areas in every UNIMAS's departments. The system enables top and mid-management in UNIMAS to have a clear look on the areas that needed attention by looking at the figures, revenues and risks. The features, ease of use and flexibility provided by the system makes the performance analysis in UNIMAS to be performed in an ideal solution. Charts are provided by the system for ease of student performance's interpretation. .

### SOFTWARE REQUIRMENT:

- 1.Integrated Development Environment (IDE) can be defined as software that give its users an environment for performing programming, along with development as well as testing and debugging the application.
- 2.Visual Studio Code: It is popular open-source IDE or editor for major programming language. It supports windows, Linux, macOS. By default, popular language JavaScript, NodeJS, typescript and Nodejs.
- 3.Browser: Chrome Technology.

### DATABASE:

PG Admin: It is the leading open-source management tool for PostgreSQL, the world's most advanced open-source database Admin 4 is designed to meet the need of both novice and experiences PostgreSQL users alike, providing a powerful graphical interface that simplifies the creation, maintenance and use of database objects.

### TECHNOLOGY USED:

#### 1.Front End Technology:

#### HTML, CSS:

CSS is a language of styles rules that we use to apply styling to our HTML content, for example sting background colors and fonts, and laying out our content in multiple columns.

#### JavaScript:

JavaScript is a scripting or programming language that allows you implement complex features on a web pages every time a web page does more than just sit there and display static information for you to look at displaying timely content updates, interactive maps, animated 2D/3D graphics, scrolling video jukeboxes.

#### Bootstrap:

Bootstrap is a potent front-end framework used to create modern websites and web appestat's open source and free to use, yet features numerous HTML and CSS templates for UI interface elements such as buttons and forms.

### 2.LANGUAGE:

Python (Version 3.9.3): It is a general-purpose coding language which means that, unlike HTML, CSS and JavaScript, it can be used for other types of programming and software developments besides web development.

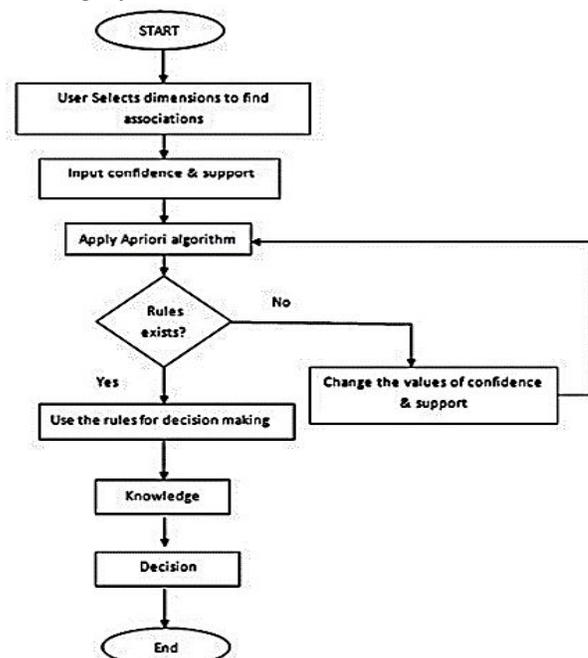
### 3.BACK-END TECHNOLOGY

#### Django (Version 3.9):

Is a high-level python web framework that encourages rapid development and clean, pragmatic design, built by experiences developers, it takes care of much of the hassle of web development, so you can focus on writing your app without needing to reinvent the wheel.

### PURPOSE SYSTEM:

Following system shows flow chart of our e-commerce



The system is a software-based web-application followed by some trending technologies like Python, Django framework and Machine learning. This trending technology has played a vital multi-level for analysis system is a design based in order to illuminate the problem. This system is based on computer technology that gives information about student development. The proposed system is designed to eliminate all the drawbacks of the judgement taking on student report. The system shall be responsible for maintaining information about students result which are available.



In this way, our webpage is visible to the user and he/she can see his/her performance in the form of graph.

## REVIEW DISCUSSION:

Now a days many organisations need future analysis data to overcome the pitfalls or the improvements to be made by using analytical tools. In view of this project we are going to predict the student progression to analyse the better assessment. We propose to predict the student performance by considering their academic details. To perform this we have collected sample data, by using this we predict the student's progression. Better anticipation of student's fortune in higher academic institutions is one approach to attain top level of quality in education system.

1. In different educational institutions a huge amount of data is generated for the evaluation of student's performance. The data for each student is needed to be analyzed separately for his/her performance evaluation by the faculty. The data mining is widely used in education field to find problem arise in the field. Student performance is of great concern in the education institutes where several factor affect the performance. The objective for this is to study existing techniques and tools for better understand of concept of education data mining process To evaluate student's data to determine the student performance in courses. To improve the quality of student by focusing on weak results. The data and information gained from the learning system can be used as an substantial for monitoring of the potential student failure in the collage. The information from a collage system can be rapidly assigned to find the performance of student in the collage. This technique can give the input for the teacher and student about the academic result.

IDEs provide interfaces for users to write code, organize text groups, and automate programming redundancies. But instead of a bare bones code editor, IDEs combine the functionality of multiple programming processes into one. There are a number of reasons to use an IDE, most of which revolve around software development. The platform centralizes three key tools used by most developers: source code editors, debuggers, and compilers. This allows users to write, perfect, and process code within a single environment.

Classification is one of the most frequently studied problems by data mining and machine learning (ML) researchers. It consists of predicting the value of a (categorical) attribute (the class) based on the values of other attributes (the predicting attributes). There are different classification methods. Bayesian classification is an algorithm that is based on Bayes rule of conditional probability. Bayes rule is a technique to estimate the likelihood of a property given the set of data as evidence or input. Bayes rule or Bayes theory is-

$$p(C|F_1, \dots, F_n) = \frac{p(C) p(F_1, \dots, F_n|C)}{p(F_1, \dots, F_n)}$$

A more recent development in classification is that of artificial neural networks. These networks are modeled after the human neural system (hence the name), and have proven to be as powerful, if not more, as any other algorithm. While implementations may be complex, these networks are capable of understanding non-linear patterns. A detailed description of the algorithms can be found in . Kotsiantis et al [1] compared five algorithms, viz. Decision Trees (C4.5), Naive Bayes algorithm (Bayesian networks), 3-NN (kNN), RIPPER (Rule Learning) and WINNOW (Perceptron based neural networks). This study was composed of two experimental stages, training and testing. During these stages, number of attributes was increased step-by-step. For example, while only demographic data was included in the first step, performance attributes were added in the next step. Five algorithms were tested for each these subsequent steps and then they were compared. This comparative study helped in narrowing down candidates for our own application.

However, classification of data into binary groups seems insufficient. The primary goal of this study was only detecting at-risk students instead of determining performance levels of students. Classifying students according to their performances in different levels (e.g. poor, average, good, excellent, etc.) might be more useful. In this way, instructors can provide more adaptive feedback for each student.

**FUTURE PROSPECTS:**

The future scope of this paper will use other attributes related to the students college life , like extra circular activities , related to social media , sports , achievements, communication skills etc.. And also information related to their parents like profession, education details , how much they stay involved. By this analysis job predictions could get efficient and easier. .Also new features could get added to make the system more efficient in the future

**CONCLUSION:**

In this paper we analyze different techniques like decision trees-means clustering, association rule mining based on various attributes, for the prediction of students' academic performance. But K- means clustering is better than other types because, it is very easy to understand for the large amount of data. Decision trees and association rules are efficient in the case of small amount of data. But when there is more change in student data base, it is better to use the proposed system for K-means clustering. The proposed system for K-means clustering is time consuming and efficient in the prediction of student's performance.

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