

A Review on Students Performance Prediction using Machine Learning Algorithms

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Abstract: In the current scenario, this is difficult to predict students' future results based on his/her current performance. As the outcome of this, the teacher can advise him/her to overcome the poor result, and also it can coach the student. By finding out the dependencies for final examinations. The system suggests to students about subject/course selection for the upcoming semester and act as roles of adviser/teacher. Due to improper advice and monitoring a lot of student's futures in dark. This is difficult for a teacher to analyze and monitors the performance of each and every student. The system can give feedback to teachers about how to improve student performance. This paper carried out a literature review from the year 2003 to 2021. The system predicts his/her future results by applying Machine Learning Algorithms like k- Nearest Neighbor (k-NN), Support Vector Machine (SVM), and Naive Bayes at an earlier stage.

Keywords: Machine Learning Algorithm, Student Performance Prediction, k-NN, SVM.

I. INTRODUCTION

Predicting automated student performance is an important task due to the large amount of data in the educational database. This job is being looked after by the Educational Data Mining (EDM). EDM develops methods to detect data obtained from the educational environment. These methods are used to understand students and their learning environment. Educational institutions are often curious about how many students will pass / fail for the required number of students. Previous studies have shown that many researchers focus on choosing the right algorithm for the right classification and neglect to solve problems that occur during the data mining phase, such as high data measurement, class imbalances, and classification errors. Reducing the accuracy of the model reduced the problems.

Many well-known classification algorithms have been implemented in this domain, but this paper proposed a model of student performance estimates based on the tree classification of supervised learning decisions. In addition, an integrated method is applied to improve the efficiency of the classifier. Ensemble Methods Approach has been developed to solve classification, prediction problems.

II. LITERATURE SURVEY

[1] Automatic Student performance prediction is a crucial job due to the large volume of data in educational databases. This job is being addressed by educational data mining (EDM). EDM develop methods for discovering data that is derived from educational environment. These methods are used for understanding student and their learning environment. The educational institutions are often curious that how many students will be pass/fail for necessary phases such as data high dimensionality, class imbalance and classification error etc. Such types of problems reduced the accuracy of the model. Several well- known classification algorithms are applied in this domain but this paper proposed a student performance prediction model based on supervised learning decision tree classifier. In addition, an ensemble method is applied to improve the performance of the classifier. Ensemble methods approach is designed to solve classification, predictions problems. This study proves the importance of data preprocessing and algorithms fine-tuning tasks to resolve the data quality issues. The experimental dataset used in this work belongs to Alentejo region of Portugal which is obtained from UCI Machine Learning Repository. Three supervised learning algorithms (J48, NNge and MLP) are employed in this study for experimental purposes. The results showed that J48 achieved highest accuracy 95.78% among others.. arrangements. In previous studies, it has been observed that many researchers have intension on the selection of appropriate algorithm for just classification and ignores the solutions of the problems which comes during data mining recognition systems will be done. It will improve the performance of the legitimate traffic.

[2] This paper aims to cut back the manual procedures concerned within the performance analysis and analysis of scholars, by automating the method right from retrieval of results to pre-processing, segregating, and

storing them into information. We additionally expect to perform examination on immense measures of information viably and encourage simple recovery of different sorts of data identified with understudies' execution. We give a degree to build up to information stockroom wherein, we can apply information mining methods to perform different sorts of examinations, making a learning base and use it further, for forecast purposes

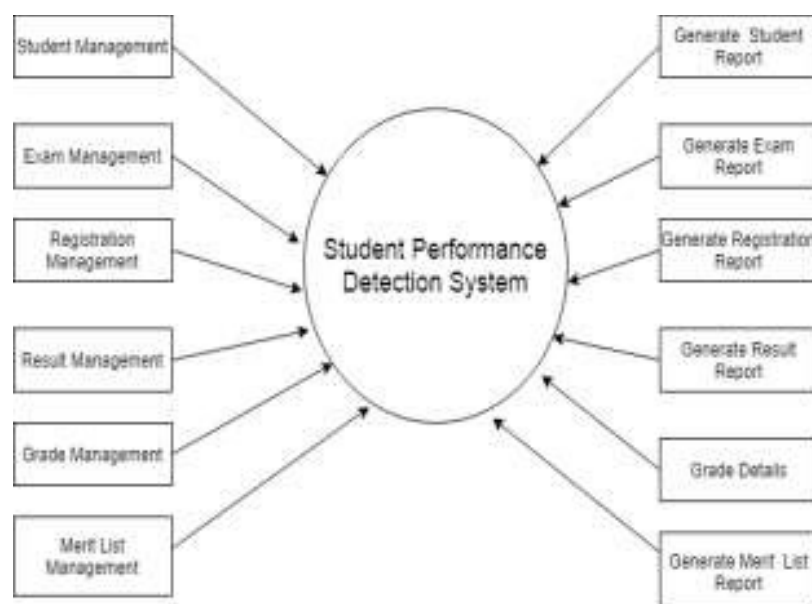
[3] For a productive and a good life, education is a necessity and it improves individuals' life with value and excellence. Also, education is considered a vital need for motivating self- assurance as well as providing the things are needed to partake in today's World. Throughout the years, education faced a number of challenges. Different methods of teaching and learning are suggested to increase the learning quality. In today's world, computers and portable devices are employed in every phase of daily life and many materials are available online anytime, anywhere. Technologies like Artificial Intelligence had a surprising evolution in many fields especially in educational teaching and learning processes. Higher education institutions have started to adopt the use of technology into their traditional teaching mechanisms for enhancing learning and teaching. In this paper, two datasets have been considered for the prediction and classification of student performance respectively using five machine learning algorithms. Eighteen experiments have been performed and preliminary results suggest that performances of students might be predictable and classification of these performances can be increased by applying pre-processing to the raw data before implementing machine learning algorithms.

[4] Predicting students' performance is one of the most important topics for learning contexts such as schools and universities, since it helps to design effective mechanisms that improve academic results and avoid dropout, among other things. These are benefited by the automation of many processes involved in usual students' activities which handle massive volumes of data collected from software tools for technology-enhanced learning. Thus, analyzing and processing these data carefully can give us useful information about the students' knowledge and the relationship between them and the academic tasks. This information is the source that feeds promising algorithms and methods able to predict students' performance. In this study, almost 70 papers were analyzed to show different modern techniques widely applied for predicting students' performance, together with the objectives they must reach in this field. These techniques and methods, which pertain to the area of Artificial Intelligence, are mainly Machine Learning, Collaborative Filtering, Recommender Systems, and Artificial Neural Networks, among others.

III. PROPOSED SYSTEM

The main purpose behind this project is to implement a system based on Desktop application to predict the student performance. So one Desktop application based on machine learning is used to predict the performance of student to get selected in company or need of classes to improve student chances to be get selected in company.

- Students-: Enter previous year marks for performance detection. Or Enter 10th or 12th marks for guidance.
- Teacher -: Enter particular student marks to checking students performance



IV. DATA

We collect student's data from university or collage to predict performance of student

V. ALGORITHM**5.1 SVM**

We are using Support Vector Machine (SVM) in our project to detect predator. It is a supervised machine learning model that divides dataset into different classes on hyperplane which is used to find maximum margin. We'll feed labeled data to train our model, in prediction phase labeled data will get matched with new data with the help of the SVM algorithm in order to give desired output.

VI. CONCLUSION

In this paper present studies shows that academic performances of the students are primarily dependent on their past performances using SVM algorithm. We have multiple ML algorithm like KNN,HMM,GMM .SVM is a very efficient & simple classifier algorithm which is widely used for pattern recognition. Also it can have a very good classification performance than any other classifier. Thus we used this machine as classifier in this paper. LIBSVM is most widely used tool for SVM classification & regression. In the future, applications similar to the one developed, as well as any improvements thereof may become an integrated part of every academic institution.

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