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Predict Student Performance by Utilizing Data Mining Technique and Support Vector Machine

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Abstract - - *In this world it is very important to predict the performance of the students from the academics which is going low day by day. By utilizing Data Mining Techniques we can analyze learning of the students and predict their performance by conducting various tests. Through Semantic rules and Support Vector Machine (SVM) algorithm we will do the predictions. The Semantic rules can enhance the quality of educational content and deliver learning activities to each student. We are going to assist students by offering them proper advice and some of the recommendations through which they can improve their performance in upcoming tests. Eventually it will help to both the failure students as well as the topper students. It will avoid the students by getting failed in their academics and also help to improve their interest regarding the education. The main goal of us is to improve the quality of the educational procedures and encourage the students by predicting their performance in academics and assisting them.*

Key Words: SVM, Supervised Learning, Data Mining, Performance, Prediction

1. INTRODUCTION

The main objective of education system is to provide quality regarding education to their students. One way to achieve greatest level of quality in education system is by get knowledge for prediction regarding enrolment of students in a particular course, detection of unfair means used in online examination, detection of abnormal values in the result sheets of the students; predict students' performance and so on.

The knowledge is hidden among the educational data set and it is easily derive from data mining techniques. In system, the classification is used to evaluate student's performance. Support Vector Machine (SVM) is supervised learning technique used for prediction of student performance basis of student's attendance, each subject marks, grade etc.

This application is helpful to assist students by offering them proper advice through which they can improve their performance in upcoming tests. Our system will also assist students to recognize where they stand to get placed in companies by conducting an online test for students.

Data mining techniques can be used in educational field to move higher level for understanding learning process to identifying, obtaining and evaluating data related to the learning process of student. Mining techniqueare used in educational environment so it's called as Educational Data Mining.

2. RELATED WORK

1) Shaleena, K.P ShaijuPaul "Data Mining Techniques for Predicting Student Performance", Predicting student performances in order to prevent or take precautions against student failures is very significant these days. Nowadays, student failure and dropout is a major problem. There can be many factors influencing student dropouts. Data mining can be used as an effective method to identify and predict student dropouts. In this paper, a classification method for prediction is been used. Decision tree classifiers are also used in this paper.

2) Mustafa Agaoglu "Predicting Instructor Performance Using Data Mining Techniques in Higher Education", Data mining applications are becoming a more common and popular tool in understanding and solving educational and administrative problems in education system. Research in educational mining focuses on modeling student's performance instead of instructors' performance. Tools are used to evaluate instructors' performance is the course evaluation questionnaire to evaluate based on students' perception. In this, four classification techniques –decision tree algorithms, support vector machines, artificial neural networks, and discriminant analysis.

3) KrinaParmar Prof. DineshkumarVaghela, Dr. Priyanka Sharma "Performance Prediction Of Students Using Distributed Data Mining",The performance of students in education system in India is a turning point in the academics for all students for their brightest future career. In today's generation the amount of data stored in educational database increasing at a rapidly. These databases contain information and it helpful to giving suggestions for improvement of students' performance; these data can be located at different nodes in distributed system. Classification and prediction are widely used in different fields. In this classification techniques are used at distributed environment for predict student performance. Data mining methods are implemented at many universities for analyzing available large amount data and

extracting useful information and required knowledge to support decision making.

4) Shaymaa E. Sorour , KazumasaGoda and Tsunenori Mine "Estimation of Student Performance by Considering Consecutive Lessons", Examining student learning behavior is one of the educational issues in every university. In this paper, we propose a new method to prediction of student performance by using comment data mining. A teacher just asks students after every lesson to freely describe and write about their learning situations, attitudes, tendencies, and behaviors. The method employs Latent Dirichlet Allocation (LDA) and Support Vector Machine (SVM) to predict student grades in each lesson. In order to obtain further improvement of prediction results, we apply a majority vote method to the predicted results obtained in consecutive lessons to keep track of each student's learning situation easily.

5) In this paper, analyze students learning and extract semantic rules that can be used to easily predict student's performance. The students' performance at tests during the semester is analyzed and the methodology utilizes decision trees and extracts rules to make predictions regarding the student's performance. The methodology has been integrated in an educational system used to assist students in learning the Artificial Intelligence (AI) course in our university. The educational system utilizes semantic web technologies such as ontologies and semantic rules to enhance the quality of the educational content and the delivered learning activities to each student. The methodology can assists the system and the tutor to get a deeper insight of the students' performance, trace students that are underachieving or in the edge to fail the final exams and also offer proper recommendations and suggestions to each one student for improvements.

3. EXISTING SYSTEM

In current system Data mining focuses on collecting knowledge from databases such as academics data. The main challenge is to improve the quality of educational process. In this system the student's performance is predicted with the help of J48 algorithm and the WEKA Tool. The data is collected from database and the feedback form is entered in excel sheets and then converted to ARFF format for processing in WEKA Tool.

4. PROPOSED SYSTEM

In current system we are create a desktop application by using Data Mining Technique which will help to analyse student performance. Now a day's educational data mining is arising with various approaches such as prediction, analysis, visualization etc. In this system we are predicting student's performance using Support Vector Machine (SVM) by collecting academic details and conducting online test. The main challenge is to improve the quality of educational process. In our system we are collecting data from the databases. The database basically used for storing user details are like Username, Password, Academic marks, Online test marks etc.

There are three types of users in our system:-

A. Student
B. Staff/TPO
C. Admin

In below section all user's functionalities are explains in briefly.

A. Student:

Student is main key of this application. This system is create to predict student performance using academics details like attendance, SSC marks, HSC marks or Diploma marks, each subject mark, online test marks, etc. If they login and register in this system then only they are capable to take advantage of application. Students can give online test and also view test performance. They analyse self performance through online test and it's more beneficial for student because it gives idea for improve their performance.

B. STAFF/TPO:

Staffs have authority of login for generating student attendance and predict student performance. The attendance will be displayed through excel file**.** We can view student performance through graphs also views result of online test.

TPO is most important part of our system because it gives details about placement to student like campus drive, company name, designation in company, criteria, salary, whether students are eligible for company or not etc. It means they provide data regarding placement. Staff / TPO request to admin for schedule online test for student. The Training and Placement Officer will go through the predicted result and interact with students regarding where they are lying behind so that it will be beneficial for students to get applicable for their interviews.

C. ADMIN:

Main thing of our system is management of database like management of student and staff details, company details etc. Admin upload a notification regarding any changes like exam schedule. It also generates student's performance report through academics details and online test. Then graph is generated and it is more efficient to read a student performance.

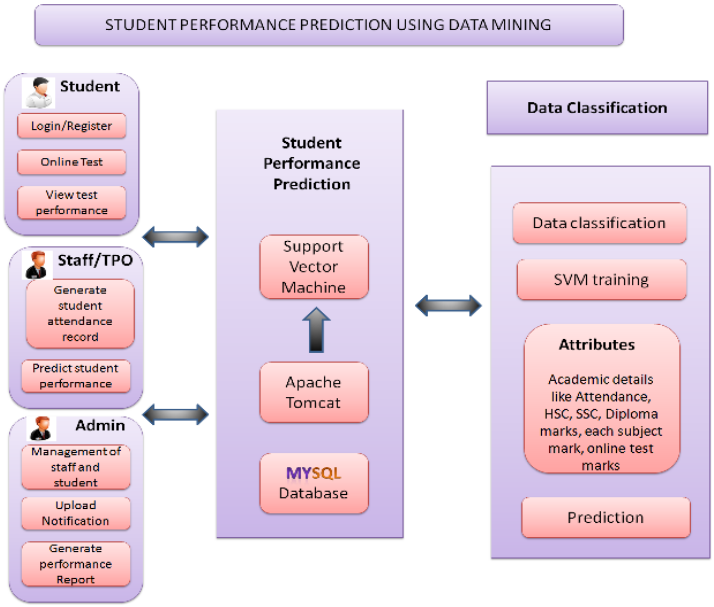

Fig-1: Architecture of student performance prediction system

Fig1 shows the architecture of our system which gives idea about student prediction performance system.

5. SVM ALGORITHM

In machine learning, support vector machines (SVM) are used as supervised learning models and associated with learning algorithms used for analysing data.

5.1 SVM steps:

- Finding the Closest Pair of Points
- Adding a Point to the Support Vector Set
- Pruning

5.2 SVM Algorithm:

candidateSV = {closest pair from opposite classes}
while there are violoting points **do**
Find a violator
CandidateSV = CandidateSV U violator
If any $\alpha_p < 0$ due to addition of c to S **then**
CandidateSV = CandidateSV \ p
Repeat till all such points are pruned
End if

6. FUTURE SCOPE

Future work is most important part of any software. In our system future scope will expanding by analysing student records with the help of extra-curricular skills and give a suggestions on communication skills as well as technical skills. This system surely builds the student professionally good and better.

7. CONCLUSION

This system can be useful for educational purpose. With the help of this system student as well as staff knows the academic status of students in advance. So staff will provide guidelines to student for improving their academics result. Training and placement officer also knows that in which company students can appearing for placement. This system will improve the quality of education system which can be increased easily. In this system we are using SVM technique. SVM is a strong classifier which can identify two classes i.e. training and test data for prediction.

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