Predicting Students Grades Using Artificial Neural Networks and Support Vector Machine

Sajid Umair
National University of Sciences and Technology (NUST), Pakistan

Muhammad Majid Sharif
National University of Sciences and Technology (NUST), Pakistan

INTRODUCTION

Education is not limited to just studying books, cramming notes and passing exams. There are a lot of other activities and habits that can affect your education. If we know what type of habits are having a bad impact on our children's studies we can try to eradicate these habits and we can replace the one's with better impact. In fact changing daily lifestyle can improve children's learning skills. In recent times, learning analytics is being used by faculty members in their courses to help students learn and improve. Eeverything considered, these analytics play important part for the prediction of students' performance and its improvement. The definition of Learning analytics is that, the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs (Long & Siemens, 2011). Learning analytics is used for improving student's performance, to predict it and for the purpose of retaining because with learning analytics faculty, institutions and students are able to make data-driven decisions about student's success and retention (Uhler & Hurn, 2013). A classroom has a variety of students with performances on a broad range. Some of these students show great care and perseverance and are self-motivated but there are also those that have difficulty studying and understanding. Teachers are there to guide students and to motivate them. But observing each and everyone's learning attitudes all over the periods in the semester is a hard task. Different regular assessment methods have been used in previous studies such as e-learning logs, test marks and questionnaires to observe and assess students' learning behavior. Although, teacher's observation plays important role to increase students educational situation, they get only a few cases requiring to their needs, mostly due to their experience in the class. In this chapter our focus is on finding those skills that are having bad effect on learning environment and suggest them to the parents. We used various data mining methods to find the outcomes and also verified by our class labels that how well our algorithm works. Data mining methods and tools we used in this paper are introduced in this part by a sequence in which they were used.

In this chapter first we will discuss the introduction part in detail. After this we will explain in detail, the literature review of the chapter and also discuss some important topics which play key role in this chapter. After this we discuss the implementation and results part. And at the end we discuss the conclusion and future work section.

BACKGROUND

In educational environments, it is very important to predict student's performance. To amplify a students' performance is a long-term goal in all aca-

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demic institutions in their learning environment. Now a day, data mining technique 'Educational Data Mining' (EDM) is used on a large-scale to automatically analyze the student's performance and his behavioral data with learning environments. The use of text mining is a new trend in EDM that extends data mining on text data. A lot of experiments have been done in past couple of years in areas to predict students' academic performance. A couple of methods have also been applied in Machine learning area to obtain useful/important data and for the prediction of future data trends.

Now we want to discuss in details about the Educational Data Mining (EDM). According to the websites being used for the educational data mining, the educational data mining is an emerging field. In this field we use and developed different type of methods which are used to investigate the different data types, which we collect from the field of education, and in future that data is used for the prediction and understanding of students. Moreover different experts (Baker & Yasef, 2009; Romero et al., 2010) categorize the educational data mining work in different categories like visualization, regression, statistics, classification and clustering. Educational data mining is used for different purposes in different fields like learning performance, judge students, increase learning process, pilot students learning, give evaluation and learning recommendation of student learning behavior, judge learning elements, judge problems and abnormal learning situations, and gain broad understanding of education (Baker, 2009; Gorissen, Bruggen & Jochems, 2012). Some Literature related to the educational data mining is give below. Gorissen and their group used the education data mining technique and analyzed the student interaction with the record learning (Gorissen, Bruggen & Jochems, 2012). The lecture capture system is used for data and they combine and used that data with the survey data. They found variations and similarities between the actual data and students reports. The proposed data for the students have a bigger chance of qualifying the exam. At the end they get a result and say that the difference between the actual data and the verbal report, the analysis will no longer depend on verbal report. Jovanovica and his team applied and tested the classification models which were used for the predicting the performance of students. And also applied the models related to clustering for the categorization of students on the basis of their cognitive styles in e-learning environment (Jovanovica. et al., 2012). They prove and suggest that the model related to classification is very helpful and useful for students, teachers and business peoples.

Parack also used different algorithms related to data mining for profiling students on the basis of academic results and records like attendance, exam marks, practical exam and team work score etc and cluster them with the help of K-mean method (Parack, Zahid, & Merchant, 2012*)*. They also found that the data mining is very helpful and important to explore and detect the important data relate to the profiling students.

Wu He also explained a technique which he used to exploit huge students data like chat messages and online questions and that data collected automatically with the help of system, that system is called live video streaming system (He, 2013). The results of text mining and data, acknowledge interesting patterns in the interaction of students and teachers. At the result the students related to health and education asked more questions as compared to the science and engineering students. Two courses related to education also have positive correlation between the final grades of students and number of questions.

Now we discuss the text mining and its role and importance. Text mining is the extracting and finding the important or useful data, directions, models, patterns, trends from the unordered text like HTML file, emails, text document etc. Different applications of text mining are summarization of text, analysis of links, extraction of information and data, clustering (Ananiadou, 2008). The text mining is also used for the extraction, integration, identification, and managing the data related to