



TAMING OF RESULT PREDICTION BASED ON IQ AND EQ

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Abstract

Performance of students in Professional courses is getting down each year. There is a need for analysis of factors causing decrease of performance. The finding of hidden knowledge from the didactic data system by the process of data mining technology to evaluate factors affecting student routine can lead to a better academic planning and management to reduce students dive out from the course, as well as can generate valuable information for making assessment of stake holder to improve the quality of higher educational system. Data mining technique can be used for analysis and prediction. In this paper the real data set of student marks from Adi Shankara Institute of Engineering and Technology, Kalady, Kerala is used. Data from various sources are collected. Various steps of mining are applied to figure out useful results. Various scenarios were compared and calculated their accuracy. This study presents the work of data mining in predicting the performance feature of students. This paper presents analysis of data set using data mining algorithms. After analysis the result will be the student performance level over the period of four years. Before applying classification algorithms some feature selection algorithms are also used so as to get refined prediction results. Such examination will help educationalists to implement vital changes for training.

Keywords: Intelligence Quotient (IQ), Emotional Quotient (EQ)

I. INTRODUCTION

The memory levels of different individuals are different. The IQ that is the Intelligence Quotient value is a total score derived from several standardized tests designed to assess human intelligence. The value of IQ changes with the growth of the individuals. The individuals with high IQ have long term memory. So the individuals with high IQ can memorize things more faster than that of individuals with low IQ.

The Emotional Quotient or Emotional Intelligence (EQ) is the capability of different individuals to understand their emotions and work. On understanding their own emotions, the individuals with high EQ can understand other people's emotions too. They tend to have less stress and high memory. Therefore the people with high EQ will have high leadership qualities and can perform in academics really well. So this study will find the relationship between IQ, EQ and the academic performance of students.

The Intelligence Quotient and Emotional Quotient has a strong impact on the academic performance of students. So if the relations between these can be found by conducting an IQ test, EQ test together with the score of previous exam. The IQ, EQ together with the score of previous exam gives the General Intelligence of the student. It is very useful for the future of the students. The teachers can understand the current position of the students in their academics in a better way. Students who have low scores can be trained better so that they can score better.

It was proved [5] that there exists a relation between the IQ, EQ and the score obtained by students. Here, proposing a new idea of

predicting the result of a student by comparing his/her IQ, EQ and the result of the previous exam. This is done with the help of algorithms in data mining. The comparison of J48 algorithm with Logistic algorithm it can be easily found. EQ and IQ test is conducted among various students. These points are graded. The result is obtained and the accuracy is checked.

All the scores of IQ test, EQ test and the previous results are given equal weight age. They are all graded in similar form. The result generated, that is the predicted result must be kept confidential. The teachers can provide extra care to those who have greater chance of failure by checking this result.

Abbreviations , Acronyms and their meaning

IQ - Intelligence Quotient - is the measure of a person's cognitive capacity relative to his or her peers. It is computed by dividing the person's mental age (as measured on a scale such as Stanford-Binet Scale) by his or her chronological age, and multiplying with 100

EQ - Emotional Quotient - is defined as the skills or ability necessary to identify, assess and control the emotions of oneself, other people or entire groups, emotional intelligence is a concept that has become widely popular in management texts and related literature for its ability to enhance and capitalize on the human potential of an organization.

II. RELATED WORKS

Grading in education is the process of applying standardized measurements of varying levels of achievement in a course. Grades can be assigned as letters (generally A through F), as a range (for example 1 to 6), as a percentage of a total number of questions answered correctly, or as a number out of a possible total (for example out of 20 or 100). So in order to identify student's performance, grading system is necessary and our method is capable of predicting the performance of students in the near future exam. This method helps to analyze the performance of each student individually. Some of the grade prediction techniques are described below:-

Personalized Grade Prediction [1] -A Data Mining Approach: An algorithm that makes a personalized and timely prediction of the grade of each student in a class. Each prediction is accompanied with a value indicating the expected accuracy of the prediction. It derives a

bound for the probability that the prediction error is larger than a desired value. A preferred way of designing courses that enables early prediction and early intervention is suggested. Using data from a pilot course, the advantages of the suggested design is demonstrated. As compared to the existing system, the accuracy of this system is 65%.

Experiments are conducted based on a dataset from an under graduate course - digital signal processing, over the past 7 years. The dataset contains the scores from all performance assessments of all students and their final letter grades. The number of students enrolled in the course for a given year varies between 30 and 156. In total the dataset contains the scores of approximately 700 students. Each year the course consists of 7 assignments along with one in-class midterm after the third assignment, one course project after the final assignment and an end exam. The duration of the course is 10 weeks and in each week one performance assessment takes place. Each year the course consists of 7 homework assignments, one in-class midterm exam taking place after the third homework assignment, one course project that has to be handed in after homework 7 and the final exam. The duration of the course is 10 weeks and in each week one performance assessment takes place. The weights of the performance assessments are given by: 20% homework assignments with equal weight on each assignment, 25% midterm exam, 15% course project and 40% final exam.

Predicting Grades [2] in this method we focus on predicting grades in traditional classroom-teaching where only the scores of students from past performance assessments are available. It explains a grade prediction algorithm that can predict the grade of each student. The systems analyze data from a course -digital signal processing and consider only a single grade prediction for each student. The proposed algorithm can make a personalized and timely prediction of the grade of each student in a class. The weights of the performance assessments are given by: 20% for assignments with equal weight on each assignment, 25% for midterm exam, 15% for course project and 40% for the end exam. In this method, the comparison is based on IQ-EQ score, previous university score and hence the classification accuracy attained is 95%.

III. METHODOLOGY

Proposed methodology of the system is presented in Fig.1 which shows the overall work flow. The system provides provision for each student to attend an IQ test and an EQ test. The mark of previous exam is added to the system?. The system first evaluate the relation between IQ, EQ and the results of previous exam. Then it will predict the results by conducting an IQ test, EQ test, and also entering the score of the previous exam. The students can be given special training on the basic of the predicted output generated. The result is generated in the form of grades as a word file.

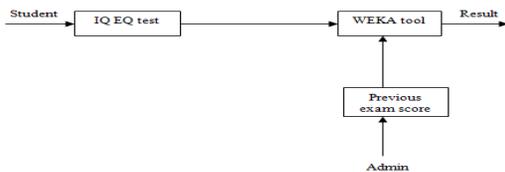


Figure 1. Workflow

A. Document Loading

This module includes loading of training data. The data which includes the previous year university marks and exams conducted in college and the marks of IQ and EQ . These data are fed in the form of single excel sheet, as it is easy for everyone to understand. The screen shot of this module is shown in Fig. 2. It shows the front phase of classification tool called WEKA. From here need to click on Explorer option from the list of applications given then upload options will shown then add the what all data required to load .

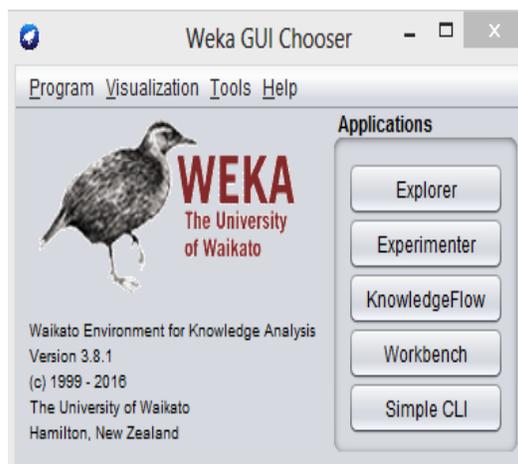


Figure 2. Document Loading

B. Selection module

The data to be loaded are directly inserted to this module where there is an option for selecting various classification strategies. The data entered can be classified as well as made

as clusters. The main aim is to have deep classification methodology. The data that entered can be visualized as graph so that analysis can be done easily.

This module also gives a deep information about how many instances takes place in classification, analysis process Fig 3. Also the attributes in the excel sheet can also be eliminated while analysis process. For example rollno and student id may not be required for analysis process so that they can be eliminated

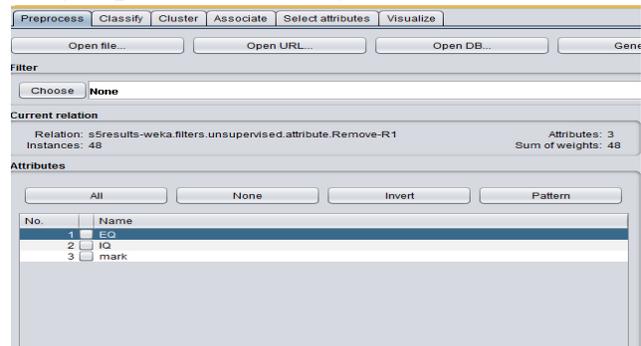


Figure 3. Selection Module

C. Visualization

The option visualization helps in having information about what is the performance of students. This module gives the count for number of students who get high, medium, low marks in the analysis by using various classification strategy Fig 4. Here in the below screen shot, it gives a detail description of data analysis. There are various grading levels such as

- S : Excellent
- A : Very Good
- B : Good
- C : Need To Improve
- D : Satisfactory
- E : Failed

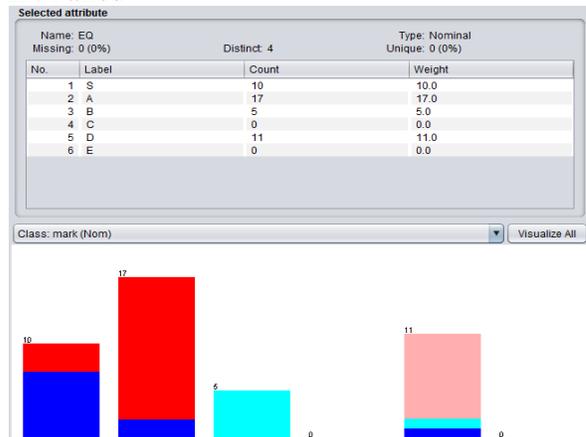


Figure 4. schema of proposed block description Pprocess

This module also gives count of students according to all categories of grades. This is pretty good to get more and more information about the student's performance.

D. Classification Algorithm used

The result obtained is mainly based on the type of classification used in the analysis phase, as said earlier there are many types of classifications and mainly used two types of classification

- 1) J48
- 2) Function Logistics

We concentrated mainly on J48 classification because it gives an accuracy of 95% with correct classified instances of 41 out of 43 instances. The rest two of the instances are incorrectly classified, the tool couldn't perform better on these two instances. This is the accuracy of the classification tool WEKA. The inaccuracy can be due to the reason that the marks entered for the two instances may be having some errors

The classification result so obtained is the result of training data Fig 5. Which means that the users had trained the WEKA tool with set of input values and with these training data the tool is going to predict the future performance of the student as a whole and also individually.

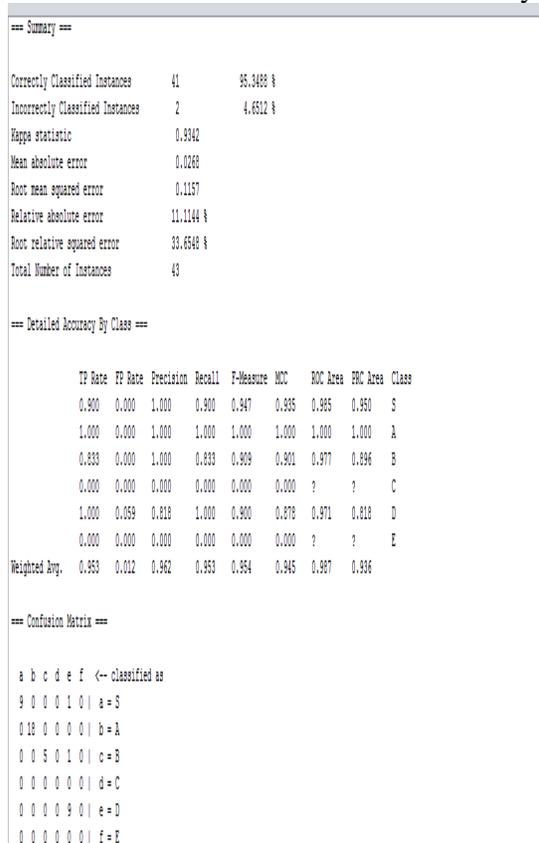


Figure 5. Result of Training Set

E. Selecting the Type of Classification

As said earlier there are different types of classification in WEKA tool of which J48 classification is best suited, because it gives an accuracy of 95% Fig 5.1. Here it is the screen shot showing how to select a particular classification schemes from the tool database. For this one need to select classify button from the menu bar. From there ,there are several classification options, one could select the useful classification schemes. The same classification can be used to predict the future performance of student. The main thing to remember is that in both training and prediction phase one must use same classification schemas, otherwise it may affect badly on accuracy.

Grades are supposed to get summarized in a single number or letter how well a student was able to understand and apply the knowledge conveyed in a course. Thus it is crucial for students to obtain the necessary support to pass and do well in a class.

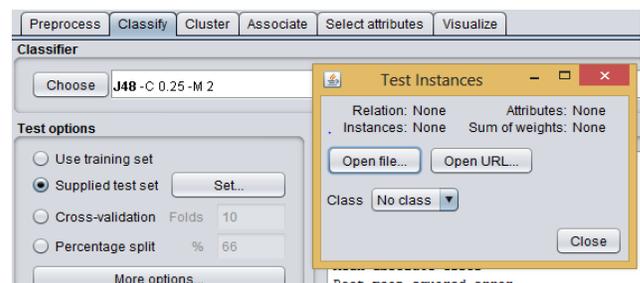


Figure 5.1 selecting type of Cclassification

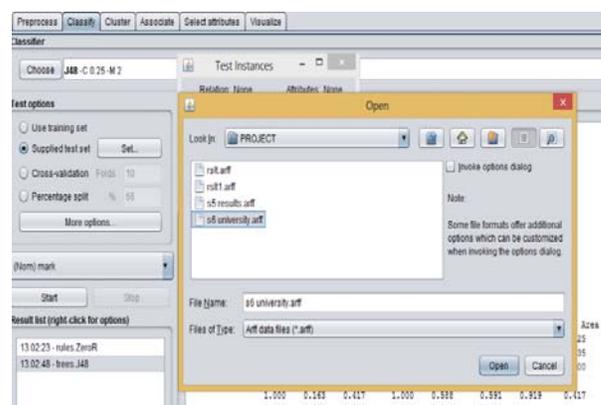


Figure 6. Selecting data for Pprediction

The above Fig 6 which contain a module to select data sheets, contain fields for predicting the future performance of student. Here s6 University.arff is the data sheet which contain a list with null field for predicting the future grades of the student.

F. Experimental Result

The result after prediction is in the form of graph which depicted in the screen shot as green x-y coordinates, but the fellow users cannot make analysis from this result. For this we need to save this, using button for saving the data.

To understand the predictive power of the scores in different performance assessments, Fig. 7.1 show the sample assessments between all performance and the overall score. We make several important observations from this result.. According to this result, it is desirable to design courses with early in-class exams. This enables a timely and accurate grade prediction based on which the instructor can intervene if necessary. In contrast to algorithms from related work, which are only shown to be applicable to classification settings (e.g. pass/fail or letter grade), this algorithm can be used both in regression and classification settings.

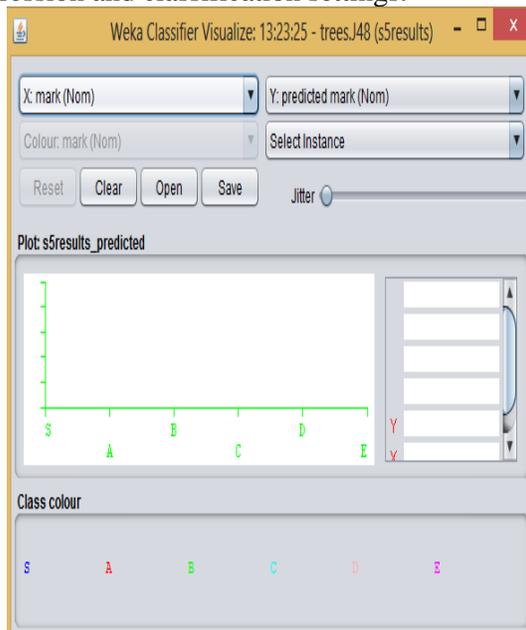


Figure 7. result after prediction

The above screen shot Fig 7 gives the predicted result of the student. Each and every student's predicted result is produced. Fifth attribute in the list is the predicted result of student's performance. The result that got after saving the graph is in the form of a word document.

Each and every student in the collage will be individually accessed. The mark scored will be compared with the mark of the series examination .The test will be held only once in a particular semester and the result of the test will be stored in the database. When the result

of series examination comes, the marks will be entered to the automated system and will be compared with test mark.

```
@relation s5results_predicted
@attribute rollno numeric
@attribute EQ {S,A,B,C,D,E}
@attribute IQ {S,A,B,C,D,E}
@attribute 'prediction margin' numeric
@attribute 'predicted mark' {S,A,B,C,D,E}
@attribute mark {S,A,B,C,D,E}

@data
1301,A,S,-1,A,?
1302,A,A,-1,A,?
1303,S,A,1,S,?
1304,D,D,-0.727273,D,?
1305,B,D,-1,B,?
1306,A,S,-1,A,?
1307,D,D,-0.727273,D,?
1308,A,S,-1,A,?
1309,B,S,-1,B,?
1310,A,S,-1,A,?
1311,D,S,-0.727273,D,?
1312,A,A,-1,A,?
1314,D,A,-0.727273,D,?
1315,D,B,-0.727273,D,?
1317,S,S,-1,A,?
1318,S,A,1,S,?
1319,S,A,1,S,?
1320,A,A,1,S,?
1321,S,S,-1,A,?
1322,A,A,1,S,?
1323,S,S,-1,A,?
1324,D,S,-0.727273,D,?
1325,D,A,-0.727273,D,?
```

Figure 7.1 prediction result

IV.CONCLUSION

This technique proposes a new method for the prediction of result of a student. Extra care can be given to those students who require by this method of result prediction. It is 90% accurate by using J48 algorithm and 95% accurate by using Logistic algorithm. A comparison between both these algorithms is also be checked. IQ test, EQ test and previous result all these are graded in similar format (that is greater than 70% - S, between 60% and 70% - A likewise). In this context, the algorithm could be extended to make multiple predictions for each student to monitor the trend in the predicted grade after an intervention

REFERENCES

- [1] Yannick Meier, Jie Xu, Onur Atan and Mihaela van der Schaar ,” Personalized Grade Prediction: A Data Mining Approach”University of California, Los Angeles, CA, IEEE,2016.
- [2] Yannick Meier, Jie Xu, Onur Atan, and Mihaela van der Schaar “Predicting Grades Transactions on Signal Processing” IEEE, 2015.
- [3] C. Tekin, J. Braun, and M. van der Schaar, “etutor: Online learning for personalized education,” in Acoustics, Speech and Signal Processing (ICASSP), 2015 IEEE International Conference on Acoustics, Speech and Signal Processing. IEEE, 2015.
- [4] M. A. Evans and A. Johri, “Facilitating guided participation through mobile technologies: designing creative learning

- environments for self and others,” *Journal of Computing in Higher Education*, vol. 20, no. 2, pp. 92–105, 2008.
- [5] Marc A. Brackett*, Susan E. Rivers, and Peter Salovey Yale University *Social and Personality Psychology Compass* 5/1 (2011): 88–103, 10.1111/j.1751-9004.2010.00334.x
- [6] “Openstax college,” <http://openstaxcollege.org/>, accessed: 2015-05-07.
- [7] Y. Meier, J. Xu, O. Atan, and M. van der Schaar, “Predicting grades,” arXiv preprint arXiv:1508.03865, 2015.
- [8] L. H. Werth, Predicting student performance in a beginning computer science class. *ACM*, 1986, vol. 18, no. 1.
- [9] A. Y. Wang and M. H. Newlin, “Predictors of web-student performance: The role of self-efficacy and reasons for taking an on-line class,” *Computers in Human Behavior*, vol. 18, no. 2, pp. 151–163, 2002.
- [10] S. Kotsiantis, C. Pierrakeas, and P. Pintelas, “Predicting students’ performance in distance learning using machine learning techniques,” *Applied Artificial Intelligence*, vol. 18, no. 5, pp. 411–426, 2004.
- [11] P. Cortez and A. M. G. Silva, “Using data mining to predict secondary school student performance,” 2008.