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An Automation for Mental Health Analysis of College Students

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Abstract: Somatization, depression, anxiety, fear, paranoid, interpersonal sensitivity and psychosis are some of the mental health problems that the college students are enduring from. These problems bring many negative effects to them. For analysis the relationship between these mental health problems from the dataset, many association rule mining algorithms are already used. These algorithms concentrate on positive rules and they don't concentrate on negative rules. So this particular paper focuses to mine both negative and positive rules from the mental health dataset of college students. Here the mental health dataset of college students is considered and by using association rules, the correlation between different mental health problems is predicted using this dataset.

Keywords: Association Rule, Positive Rules, Negative Rules, Apiori Algorithm.

I. INTRODUCTION

According to many research, because of the high competition and various pressures, college students face many mental health problems which effects them a lot in a negative way. Specifically 9% of the students suffers from depression. And 30% to 50% of those students who commit suicide is because of mental illness, and this rate is increasing every year. These mental health problems of students is dangerous to them as well as the stability of college campus .The mental health issues that the students face are analyzed by the system. This proposed system aims at identifying the correlation between different mental health problems faced by the college students. Association learning is used here to predict the pattern. Some of the approaches has applied the association rules for analysis of the mental health knowledge. But those approached only concentrates on mining the positive rules and they do not concentrate on negative rules, which provides more information compared to positive ones. We find only one study that considers the negative association rules in mining the mental health knowledge. Proposed system main objective is to analyze students' mental health problems data and give some useful information or solution for those problems. The system uses ML approach which provides information from existing students' data to manage the relation with the future students and also identifies the most effective factor to determine student's problems and adjusting those factors for student behaviors and performance improvement.

II. LITERATURE SURVEY

An Intelligent Student Advising System Using Collaborative Filtering: Here a students advising system is proposed which uses collaborative filtering, which us a technique used for systems that uses recommendation by assuming that the users having similar behaviour and characteristics will be having similar preferences. With this system, students are sorted into a few groups and an advice is given based on their similarities in the group. If a particular student is identified to be similar to a particular group, a course that is preferred by that group might be recommended to that student.. The disadvantages are System used to predict suitable course for students and dataset not compatible to predict student results. Not all student behaviours connected to course advising. Students are grouped and then system predicts the suitable course for the students. Grouping lacks over data for prediction.

Mining Students' Data for Performance Prediction: The potential to predict the performance of the students' plays vital role in educational environments. The academic performance of students' is based on various factors like social, personal, psychological and some other environmental variables. A very best tool to achieve this objective is by using Data Mining. Hidden information patterns and relationships of large amount of data are discovered using data mining techniques, this is very useful in decision making. A single data can contain lot of information in it. The processing method of data is decided by the type of information that is produced by the data. More data often produce valuable information in the educational sectors, this information produced can be used by the educational sectors to reduce low

cost information for this and also communication technology is used. The educational database is increasing quickly because of the data stored in large amount. DM approach provides the valid information from previous students so that relationships can be can be managed with upcoming students. Used more irrelevant parameters for student performance prediction such as father income, mother income, qualification etc.

An Effective Algorithm for Mining of Positive and Negative Association Rules: In the recent years, negative association rules mining has been getting few attention and it is proving as being useful to the real world. In this particular paper, a efficient algorithm is presented which is required in mining the association rules that is both the positive as well as negative in the databases. This algorithm tries to expand the conventional association rules, so that the negative rules can be included. While in the mining of negative association rules to mine the frequent negative item sets, we take on another minimum support threshold. Using numerical measure like correlation coefficient and strategies like pruning, all valid association rules can be found quickly using the algorithm and also overcome few limitations of earlier mining methods. These results that are experimented show its efficiency and also the effectiveness. The disadvantages are algorithms used here take more time processing and less efficient results.

The Application of Association Rules Mining in the Analysis of Students' Test Scores: The extraction of the efficient, implicit, potential useful knowledge and information can be mined from large amount of data. It is also used and successfully applied in other areas. The field is no much relative to education. The higher learning institutions focus on teaching, improving quality of education, but students precise more on quality of teaching. In this paper association rule mining method is applied over the student's grades, on unknown effects on student's achievements, to give references for the administrators and teachers, to give support for student management and teaching, to improve quality of teaching in colleges and universities. The disadvantages are less parameter used in project and less efficient results.

Data Mining Applications In Healthcare Sector: This page focuses on comparing on comparing different tools, techniques and approaches to get its effect on health care. The application that uses data mining is used to give the ideas that are text, facts or numbers that the computer can process into information or knowledge. Data mining application in health care system can be used to develop a tool for identifying and spreading health care information. It also aims at making a detailed report of data mining application types and in reducing the complexity of the study. It gives a comparative analysis of data mining applications that can be used for extracting knowledge from database that are generated in health industry. So, the disadvantage of existing service is that, it requires huge amount of data and gives less accurate results.

e-NFIS: Efficient Negative Frequent Item sets Mining based on Positive Ones: NAR (mining) plays an important role in real applications. First step is to mine this type of NAR is to mine the negative frequent items (NFIS). The paper concentrates on a novel method, e-NFIS for mining NFIS only from positive frequent items (PFIS). E-NFIS has 3 aspects: 1) To mine PFIS, a traditional method is used 2) From PFIS, negative candidate item sets can be generated using an effective method 3) Experimental analysis shows that, the e-NFIS is more efficient for calculating the support of negative candidate items only using the support of NFIS. Data mining tools that are used for prediction have disadvantages and are less efficient.

Graduate Student Mental Health: Anxiety and depression in graduate students are worsening day by day. Graduate students need counseling services at large universities in western United States .The reports shows that almost half of the graduate students suffers from mental health issues and over half of the report were about colleagues who faced the same problem over the past year. Few reasons for these mental health problem were functional relationship with their advisor, their financial status, regular interaction with friends, and being married. The counseling services were provided to students with depression indications, the semesters number in school, and identifying as a female. Students who already had experienced mental issues in the past year and had a good relationship with their advisors were the ones who mostly utilized counseling service. All these reports suggest that there is a increase need of attention to graduate students who are suffering from mental health problems, especially financial confidence's role in student well-being and the relationship of students with advisors. The disadvantages are only few mental health problems are focused and less efficient results.

Mental health problems in college students: College year is the most crucial period in a student life. Studies shows that more than 50 percent of college students face one or more mental health problem . If there is a mental health problem at early adulthood then there is chance that they may suffer from it till later adulthood. This is the reason why people face later adulthood mental health problems due to lack of counseling during early adulthood .The disadvantages are algorithms used here takes more time processing, less Parameters used and uses tools for data processing.

Research on the College Students' Psychological Health: College students are facing mental health problems due to exam pressure, peer pressure, society pressure and many more. The current education system does not have high quality resources in mental health education. In this paper, the author uses data mining techniques and cloud computing to analyze college student psychological health. Cloud computing is used to integrate mental health education resources into the

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cloud and share each other quality resources. By analyzing college students' psychological health management, we are creating awareness of different mental health problem faced by students. The disadvantages are algorithms used here takes more time processing and less efficient results.

III. SYSTEM ARCHITECTURE

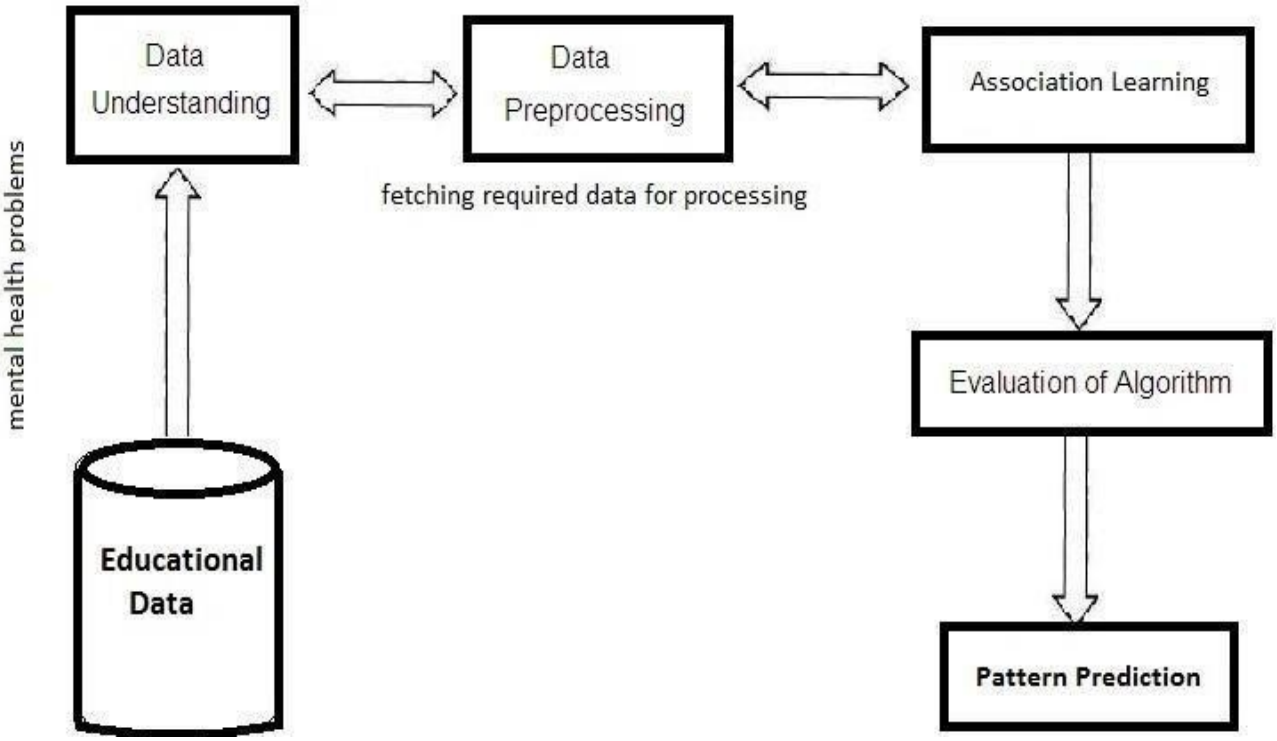

Fig 1. System Architecture

IV. PROPOSED WORK

Proposed system major objective is to analyse the student's mental health issues data and to come up with some useful information or some solution for the student's mental health problems. The system uses ML approach or DM approach which gives us the required information from previous students so that relationships can be managed with upcoming students and to find out the effective method to determine a student's health problems and also to adjust these methods to improve the student's behaviour and performance. This system analyses all mental health problems faced by the college students such as fear, somatization, anxiety, Obsessive Compulsive, hostility, interpersonal sensitivity, paranoid, depression, psychoticism. Proposed system aims at discovering the correlations between the different types of mental health issues faced by the college students. We use Association Learning or Association Rules to predict health patterns. The most familiar and well known and also the direct data science method is the Association Learning. Hence, a simple correlation is made either between two or more items, which will often be of the same pattern to predict health patterns. In our project, the Association Learning Algorithm "*Apriori Algorithm*" is required in predicting the relationship among the different mental health problems using educational dataset.

V. WORKING PROCEDURE

This is a real time application with three users that is visitor, student and admin. Students and admin need to input their id and password to login into the system. The admin can add the students into the system, he can manage the dataset, he can view the prediction module and he can update the profile.

Students need to enter their id and password given by the admin to login to the system. They can view the prediction module, post queries if any, and can also update their profile. These are the functionalities of the student.

When the application is run, if it is the visitor opening the application, then only about us, contact us and homepage will be displayed. If he is not a visitor, then the user need to login. If the entered credentials are valid, then if it is the admin then he well be redirected to his home page where he can add the students, answer queries of students, update the profile or view the prediction module. If the entered credentials is of a student, then it will be redirected to student home page where the student can view the prediction module, update the profile or post queries.

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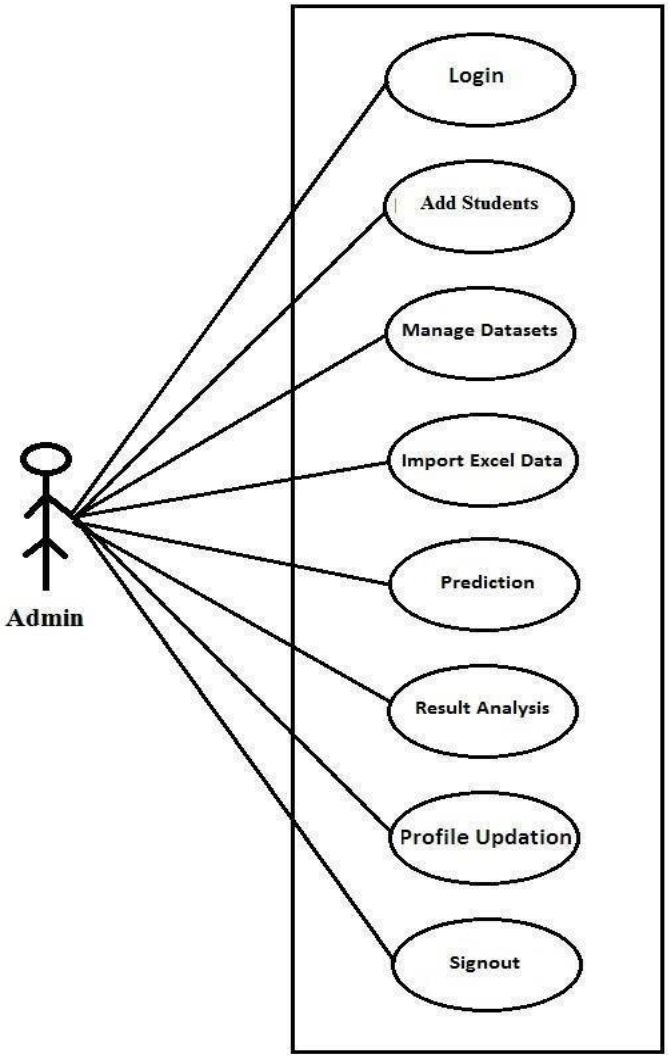

Fig 2. Use case diagram of admin

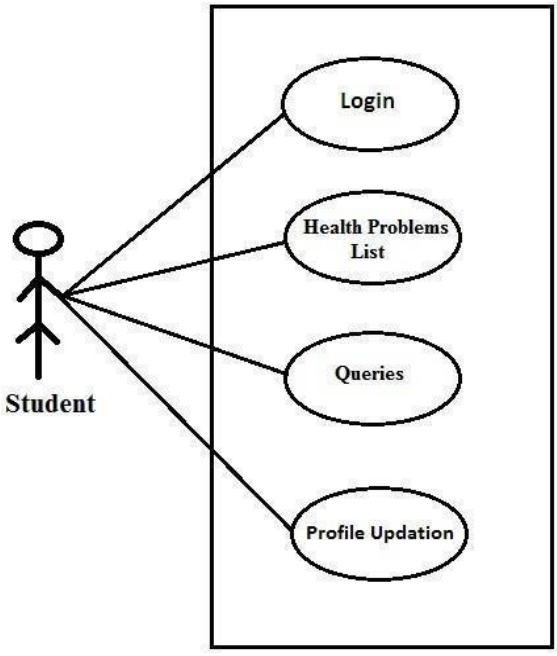

Fig 3. Use case diagram of Student

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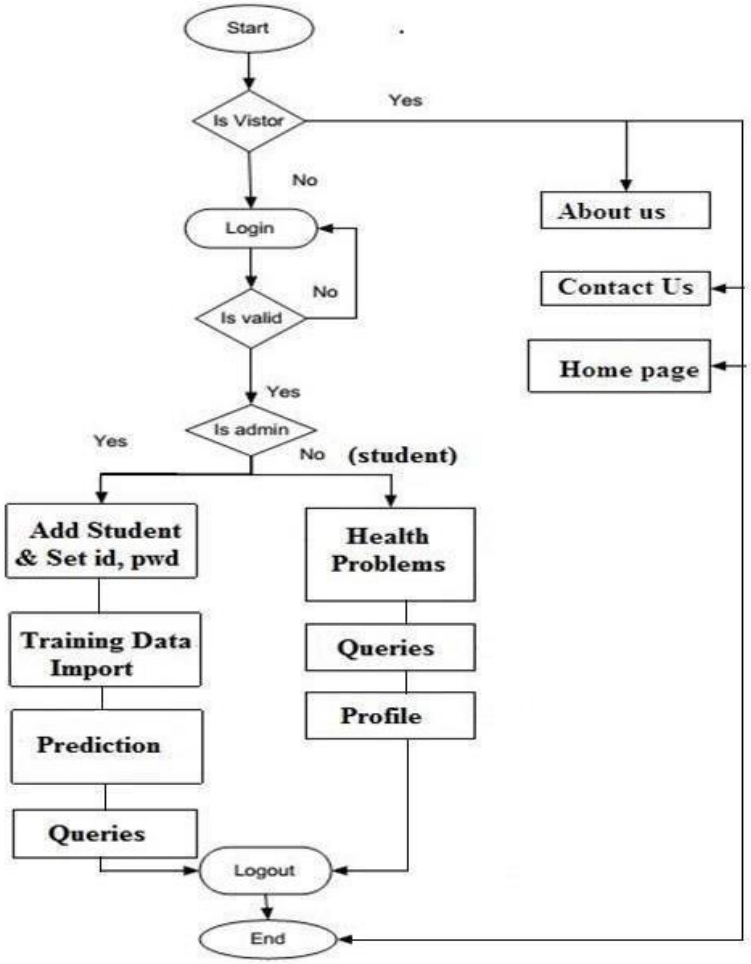

Fig 4. Flow chart

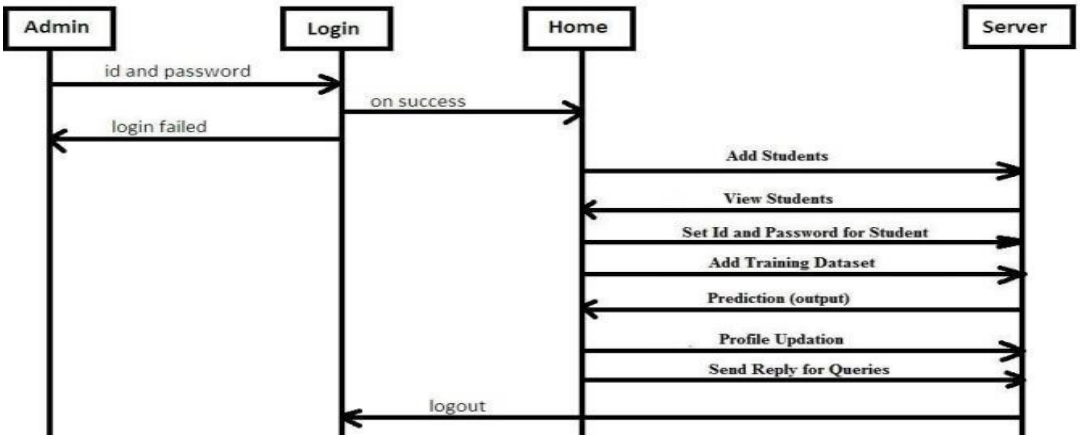

Fig 5. Sequence diagram for admin

The sequence in which the above-mentioned activities takes place is shown using a sequence diagram. The admin gives is id and password to login to the system. On success, his home page will be displayed. On failure he will again be shown the login page. The admin can add the students in to the server, he can view the students from the server, add training dataset into the server, view the prediction module from the server, update the contents in the server, etc. And when he logs out, he will be taken back to the login page.

When the student needs to login, his id and password should be entered in the login page. On success student home page will be displayed. The student can post the queries which will be saved in the server, he can view the reply for queries from the server, update the profile, view educational data from the server, etc. After he logs out, the login page will be displayed.

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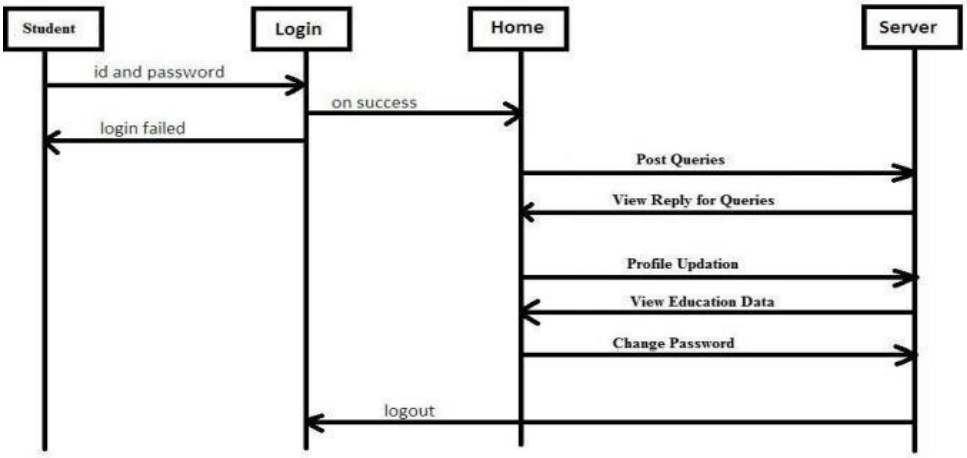

Fig 6. Sequence diagram for student

We are building an real time application where it is useful for colleges. Currently none of the education sector applications does this and we use data science algorithm to get better and accurate results. Thus the chosen design is better.

VI. CONCLUSION

Developing a project useful for educational sector is a challenging task. Proposed system aims at identifying relationship between mental health problems faced by the college students. Today's generation facing lots of mental health problems such as depression, anxiety, somatization, intern personal sensitivity etc.. System finds the solution for these problems by predicting the correlation between different mental health problems and helps to solve the students' health problems. Identifying students' problems and factors can improve the student performances.

VII. FUTURE ENHANCEMENT

We can add enhancement where system finds the current problems faced by college students using data sciencetechniques. We can add parent module where parents can view and review the problems faced by the college students and come up with some solutions.

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