STUDENT PERFORMANCE ANALYSIS AND PREDICTION USING MACHINE LEARNING

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Abstract:

Students have to fulfil the academic goals when they are studying in universities and colleges. They play an important role in achieving educational goals for colleges or themselves. Their intelligence is tested through various examinations, activities, attitude towards studies etc. So they should have an idea on how they should study accordingly. It gives them their analysis based on previous records so that they can know how much should they study for the coming examinations.

The main goal of this project is to manage the progress of the students in their academics. Students will be provided their login credentials and using these login credentials they enter into their account. This mode helps them to reach their goals and ultimate targets by predicting their next scores precisely so that the students can work according to their estimated scores. Students get notifications to give a reminder to the students to reach their short-term goals. This also helps students by providing them with their subject-related best articles and YouTube links, which saves time for the student. This gives them a curiosity to learn and get clear and clean knowledge about the topic they learn. And further, we will keep on adding modules to improve our website according to the student's requirements. So, the proposed system helps students to reach their educational goals like getting good aggregates and they can analyse themselves properly. Based on the previous semester's grades he gets an idea of how to prepare for the next semester.

Keywords — credentials, performance, management system, academics, modules

I. INTRODUCTION:

This student performance analysis and prediction system provides an easy way for to students in searching the details of academic attendance reports and marks/percentage details with graphs. All the details of students' attendance and marks are added by the Teachers and HODs. Students are supposed study time. Having a good track for their on their GPA, they can even allot some time for their other certifications or knowledge exploration in their interested domain and they can modify the study plan according to the time they have and maintain a

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good performance to achieve good goals in future.

II. LITERATURE REVIEW:

There are many papers and much more research is done in the fields of education. In this field there are different models which predict and give a good analysis of a particular student performance and help to maintain a good track of their profile. They deal with lot of attributes like student's grade, personal profile and GPA.

Out of these the important aspect is GPA, this attribute is major criteria for any type of interview or for further studies. In our research we introduce a new phase of learning and educating the students in an interesting way, which gives students and parents a good hope. In this model we use Machine learning, SVM and other artificial intelligence algorithms to solve the issues and to make them study.

III. METHODOLOGY:

We are introducing a model to solve all the problems faced by students to get good grades in their academics. We created this web interface for prediction and analysis of the student with set of rules and instructions and it follows the following algorithms to work more efficiently.

Random forest classifier:

Random Forest is the most efficient algorithm which uses supervised learning techniques to select the best prediction from the given dataset. It is like a forest which contains many trees and we need to select the best tree we want from them. Those trees are decision trees and predictions will be performed here. Therefore they are better and give higher accuracy compared to the single decision tree. These can solve both classification and regression problems.



Random Forest Classifier

Fig. 1 Random Forest Trees

SVM

SVM is an algorithm in Machine Learning which is linear. It is used when we need to deal with classification problems which in turn use SVM classifier and SVM repressor. It creates a line in N – dimensional space which classifies data points that belongs to separate classes. It tries to maximize the margin among two classes which will give great results and overcome the problems. With the help of neural networks we are able to use these type of effective algorithms.



Fig. 2 SVM Flowchart

K - Nearest Neighbor

K nearest neighbors is a simplified machine learning algorithm which uses supervised learning to solve the problems. It's easy to use and implement the models. It works by finding distances between nearest sample given in the dataset and then for most frequent label it specifies numbers. We should choose right k for our data by trying many k and pick up which is best.



Fig. 2 Knn Algorithm Steps

IV. IMPLEMENTATION:

Python Tkinter is used for this model to provide the graphical interface for the user. It enables the students to log in to their accounts and check their timetables and the schedules of their colleges. Login System is connected to the databases to give access to the students. This system also provides the Official holiday schedule and further implementation of updating Attendance by their respective colleges.

This system used machine learning algorithms to analyse and predict student grades. We use different types of ML algorithms for different modules of our system We use SVM algorithm for predicting the grade of the students according to their work on hourly basis. This shows the graphical representation of their performance which helps the students to improve their grades and know their status.

Students can reach their target goal based on their predicted future semester grades according to their previous semester GPA, this will give an idea of how much hard work they need to do inorder to reach their goal this prediction uses random forest algorithm which takes the different training datasets and finds accurate average predicted values.

This system provides recommendations for the students to explore the knowledge from their specific domain subjects by providing them good articles and YouTube links. To provide the recommendations to the system according to student requirements we use KNN machinelearning algorithm.

Libraries used in Python3:

- ✓ Numpy
- ✓ Pandas
- ✓ Seaborn
- ✓ Matplotlib
- / Sklearn
- / Tkinter
 - V. RESULT:

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3	2	SHYAM	8.84	9.3	9.07	8.7	8.94									
4	3	JOHN	8.9	8.4	8.65	9.2	8.833									
5	4	DAVID	9.5	10	9.75	9.2	9.75									
6	5	STEFEN	5.2	6.8	6	7.5	7									
7	6	DAMON	9	8.7	8.85	8	8.85									
8	7	VERONICA	5.6	6.2	5.9	7	7.1									
9	8	ELENA	7.4	8.6	8	8.8	8.26									
10	9	BETTY	8.48	9	8.92	9	8.82									
11	10	JESSICA	9.6	8.5	9.2	9.3	9.1									
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Fig. 4 Excel sheet containing details of students

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Fig. 6 Buttons for selecting goal



Fig. 7 Goal Prediction



Fig. 8 YouTube Links for Student References

VI. CONCLUSION:

So, mainly our proposed model is very useful for students to have a proper plan of action how to study and helps them with material required for them. They can check their predicted marks and therefore work towards their desired goal and excel in their academics. We are using ML to increase the efficiency of the model and benefits the students the most. In future we can include more into this model like sending notifications to students about their examinations, recommendations of materials and many more additional features can be added to it.

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