Student Performance Analysis using Machine Learning Techniques

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Abstract

- Performance analysis of outcome based on learning is a system which will strive for excellence at different levels and diverse dimensions in the field of student's interests.
- This paper proposes a complete system that is developed to analyze and predict the student's performance only.
- The proposed analyzes the students' demographic data, study related and psychological characteristics to extract all possible knowledge from students, faculties and parents.

- Seeking the highest possible accuracy in academic performance prediction using a set of powerful data mining techniques.
- The framework succeeds to highlight the student's weak points.
- The realistic case study that has been conducted on 480 students proves the outstanding performance of the proposed framework in comparison with the existing ones.

Project Prototype

- The main objective of this project is to analyze student performance and predict the accuracy based on machine learning supervised techniques

Problem Definition

- The main purpose is to predict student performance analysis using his/her academic and demographic data .Also the dataset collection with these two major attributes is difficult.
- In earlier systems it was predicted well with ML techniques but it was only limited to academic data.

Existing System

- The previous predictive models only focused on using the student's demographic data like gender, age, family status, family income and qualifications.
- In addition to the study related attributes including the homework and study hours as well as the previous achievements and grades.
- These previous work were only limited to provide the prediction of the academic success or failure, without illustrating the reasons of this prediction.
- Most of the previous researches have focused to gather more than 40 attributes in their data set to predict the student's academic performance.
- [illegible]

Disadvantage

- As a result, these generated rules did not fully extract the knowledge for the reasons behind the student's dropout.
- Apart from the previously mentioned work, there were previous statistical analysis models from the perspective of educational psychology that conducted a couple of studies to examine the correlation between the mental health and the academic performance.

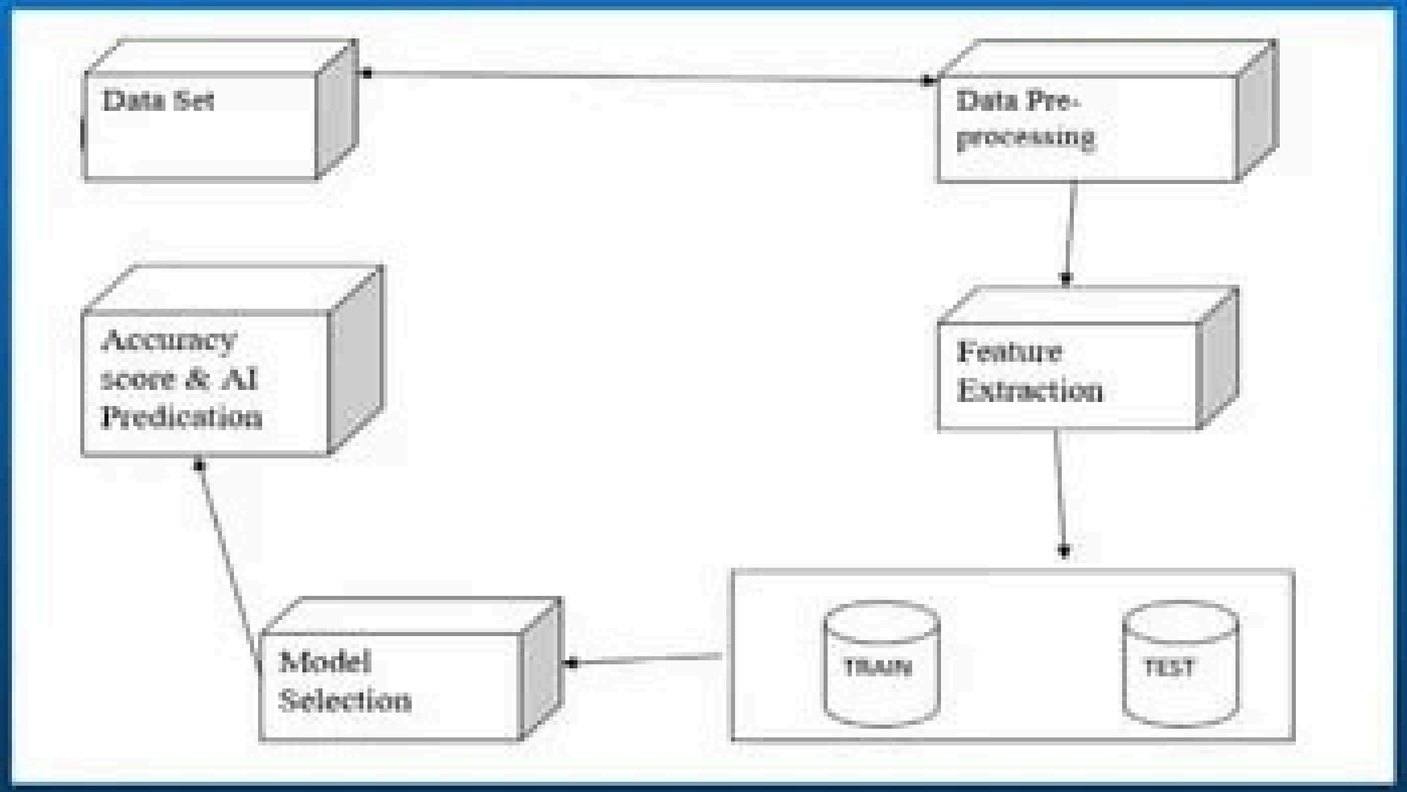
Proposed System

- The proposed framework firstly focuses on merging the demographic and study related attributes with the educational psychology fields, by adding the student's psychological characteristics to the previously used data set (i.e., the students' demographic data and study related ones).
- After surveying the previously used factors for predicting the student's academic performance, we picked the most relevant attributes based on their rationale and correlation with the academic performance
- Then on the selected dataset we have applied several classification algorithms to

Advantage

- The proposal aims to analyze student's demographic data, study related details and psychological characteristics in terms of final state to figure whether the student is on the right track or struggling or even failing. In addition to extensive comparison of our proposed model with the other previous related models.
- Improvised Accuracy

System Architecture



Hardware & software Requirement

- Hardware Requirement:
- Windows 10 64 bit
- RAM 4GB

- Software Requirement:
- Python 3.6
- Anaconda Navigator

Logistic Regression

- Logistic regression is a machine getting to know classifier. This set of rules is used to split the observations for discrete classes. The outputs given by using the logistic regression is based totally on the opportunity feature. It uses the fee function that's known as as —sigmal] characteristic. Sigma function is more complex than the normal linear function. Logistic regression limit the cost function value between 0 to 1.

Conclusion

- The work reported in this indicates the machine learning techniques with supervised learning algorithms to understand the performance of several algorithm with respect to student records where we analyses the performance of student and categorized it into three classes as **high , average, low**