



PREDICTING STUDENTS PERFORMANCE USING PERSONALIZED ANALYTICS (STAGE-II)

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Abstract: Predicting academic performance is an important task for the students in university, college, and school, etc. The factors, which affect the student's academic performance, are class quizzes, assignments, lab exams, mid, and final exams. The student's academic performance should be informed to the class teacher in advance that will decrease the student's dropout and increase the performance. In this paper, machine learning classification algorithms such as decision tree, Support Vector Machine (SVM), and Naive Bayes are implemented to predict the student's academic performance. The performance of an algorithm has been evaluated based on confusion matrix, accuracy, precision, recall, and F1 score. The obtained result shows that the Naive Bayes classification algorithm performs better

Record Terms – Prediction using SVM, Machine Learning.

I. INTRODUCTION

Automatic Student performance prediction is a crucial job due to the large volume of data in educational databases. This job is being addressed by educational data mining (EDM). EDM develop methods for discovering data that is derived from educational environment. These methods are used for understanding student and their learning environment. The educational institutions are often curious that how many students will be pass/fail for necessary arrangements. In previous studies, it has been observed that many researchers have intension on the selection of appropriate algorithm for just classification and ignores the solutions of the problems which comes during data mining phases such as data high dimensionality ,class imbalance and classification error etc. Such types of problems reduced the accuracy of the model. Several well-known classification algorithms are applied in this domain but this paper proposed a student performance prediction model based on supervised learning decision tree classifier. In addition, an ensemble method is applied to improve the performance of the classifier. Ensemble methods approach is designed to solve classification, predictions problems. This study proves the importance of data preprocessing and algorithms fine-tuning tasks to resolve the data quality issues. The experimental dataset used in this work belongs to Alentejo region of Portugal which is obtained from UCI Machine Learning Repository. Three supervised learning algorithms (J48, NNge and MLP) are employed in this study for experimental purposes. The results showed that J48 achieved highest accuracy 95.78% among other

II. MOTIVATION

- To make prediction of student possibilities to be get selected in company or need of classes.
- Students can easily get idea of their future possibilities.
- To make students aware of their future.
- Enhancement in the completion of work within the constraints of time.

III. PROBLEM DEFINATION

There is often a great need to be able to predict future students' behavior in order to improve curriculum design and plan interventions for academic support and guidance on the curriculum offered to the students. This is where Data Mining (DM) comes into play. DM techniques analyze datasets and extract information to transform it into understandable structures for later use. Machine Learning (ML), Collaborative Filtering (CF), Recommender Systems (RS) and Artificial Neural Networks (ANN) are the main computational techniques that process this information to predict students'



performance, their grades or the risk of dropping out of school. Nowadays, there is a considerable amount of research and studies that follow along the lines of predicting students’ behavior, among other related topics of interest in the educational area. Indeed, many articles have been published in journals and presented in conferences on this topic. Therefore, the main goal of this study is to present an in depth overview of the different techniques and algorithms proposed that have been applied to this subject

IV. PROJECT SCOPE

- To implement real time system for student performance.
- To perform various operation on student record to check student performance.
- To get prediction of student future possibilities.
- To have the different results in short time

V. USER CLASSES & CHARACTERSTICS

1. Registration: In Registration First, student have to register yourself in portal.
2. Upload Marks: In second phase student should upload their marks as per the academics.
3. Prediction: After uploading marks and details, students will get their prediction details about their career.



Fig 1: Use Case Diagram

VI. Tools & Technology Used

- Language - Python.
- Domain – Network.
- Database – SQLite.
- IDE - Pycharm /Visual Studio code.

**VII. Math Model****Relevant Mathematics Associated with the Project**

Let S be the perspective solution for the above problems

$S = \{s, e, i, o, DD, NDD, \text{Success}, \text{Failure}, F\}$

s= start state

e= end statement

i= set of inputs

o= set of output

Success = Desired output statement

Failure = Desired output not generated

DD = Deterministic data-set

NDD = Non Deterministic data-set

F = functions.

$S = \{s, e, I, O, \text{successs}, \text{failure}\}$

I= {set of input frame}

O= { }

DD = { }

NDD = { }

$F = \{F1, F2, F3, F4, F5, F6\}$

Where F1 =Login ()

F2 = Registration()

F3 = upload marks()

F4 =process marks ()

F5 =predictdata ()

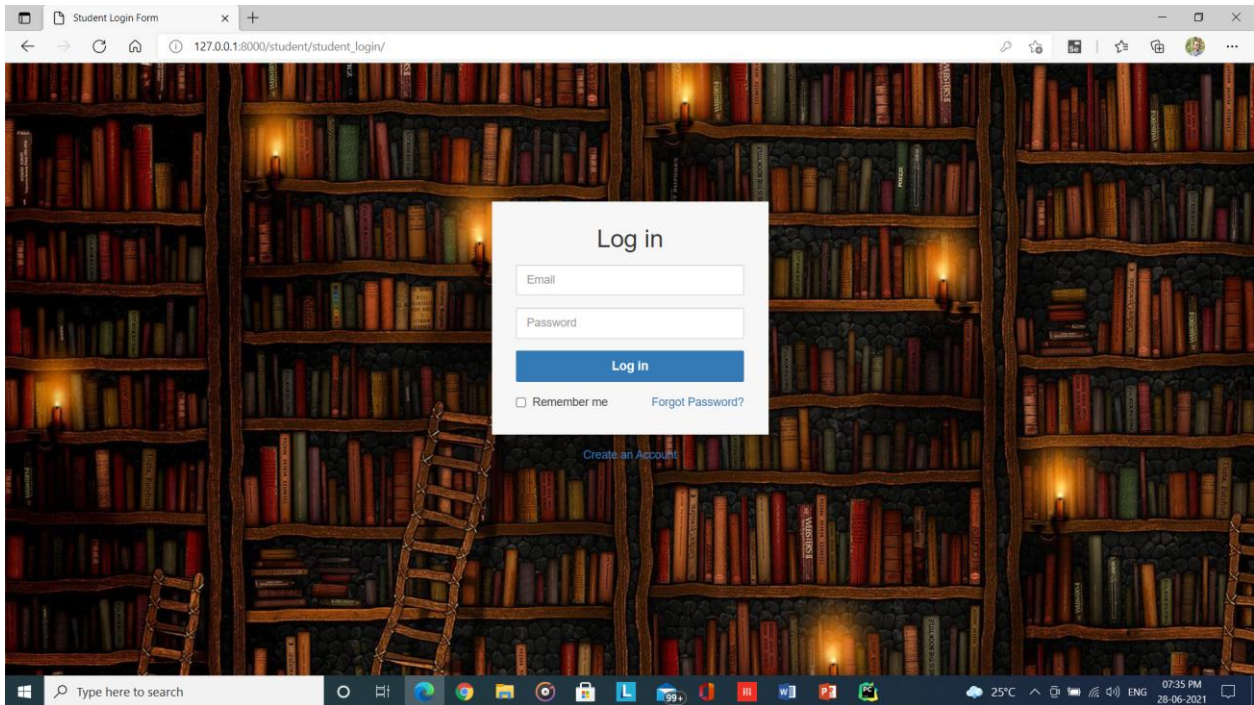
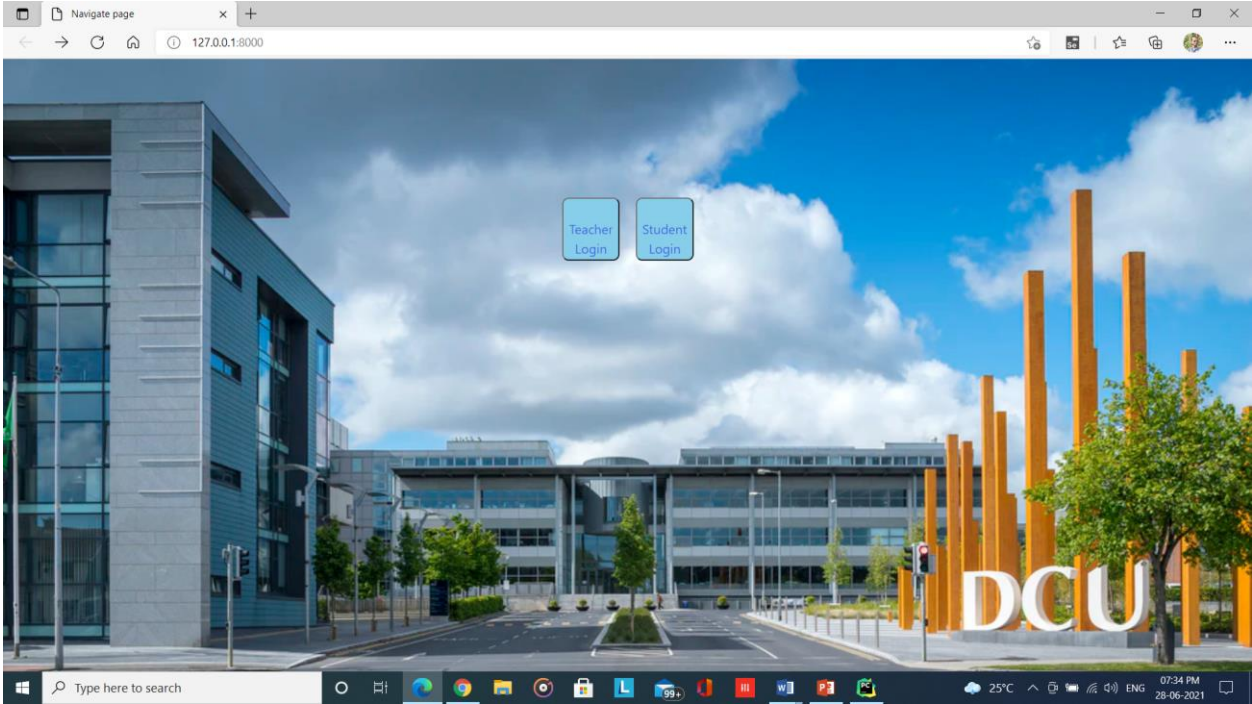
F6 = Record Database()

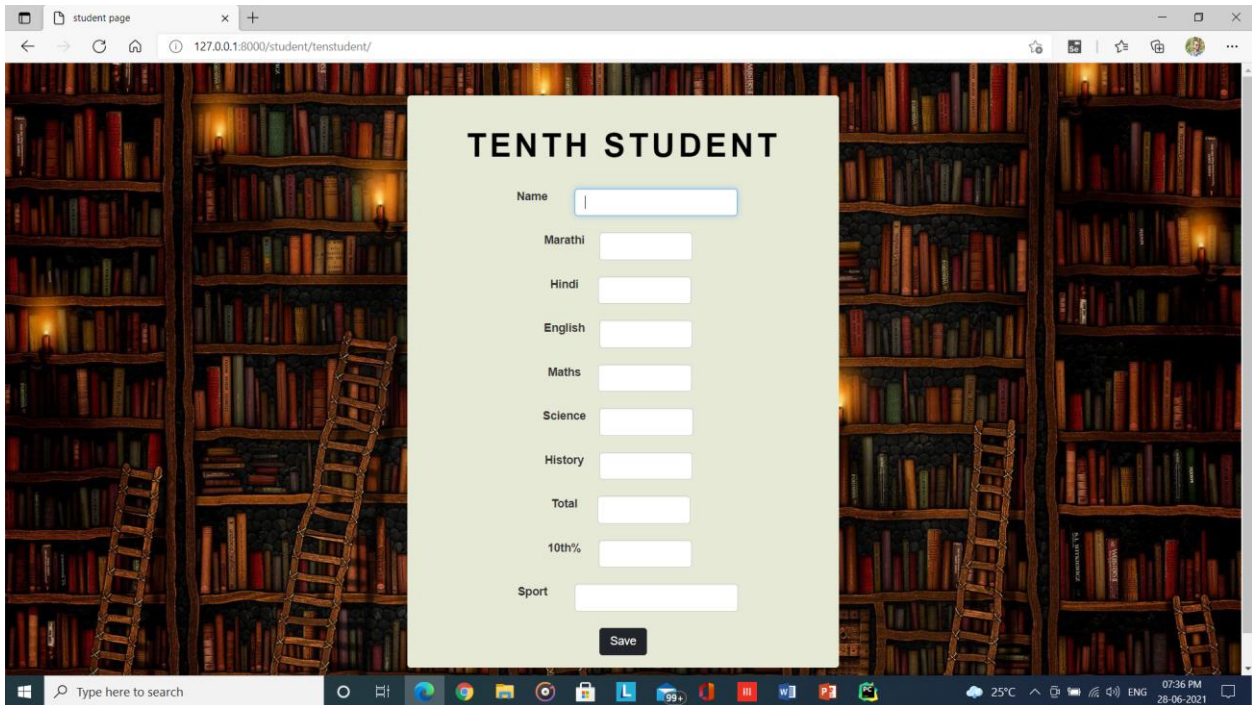
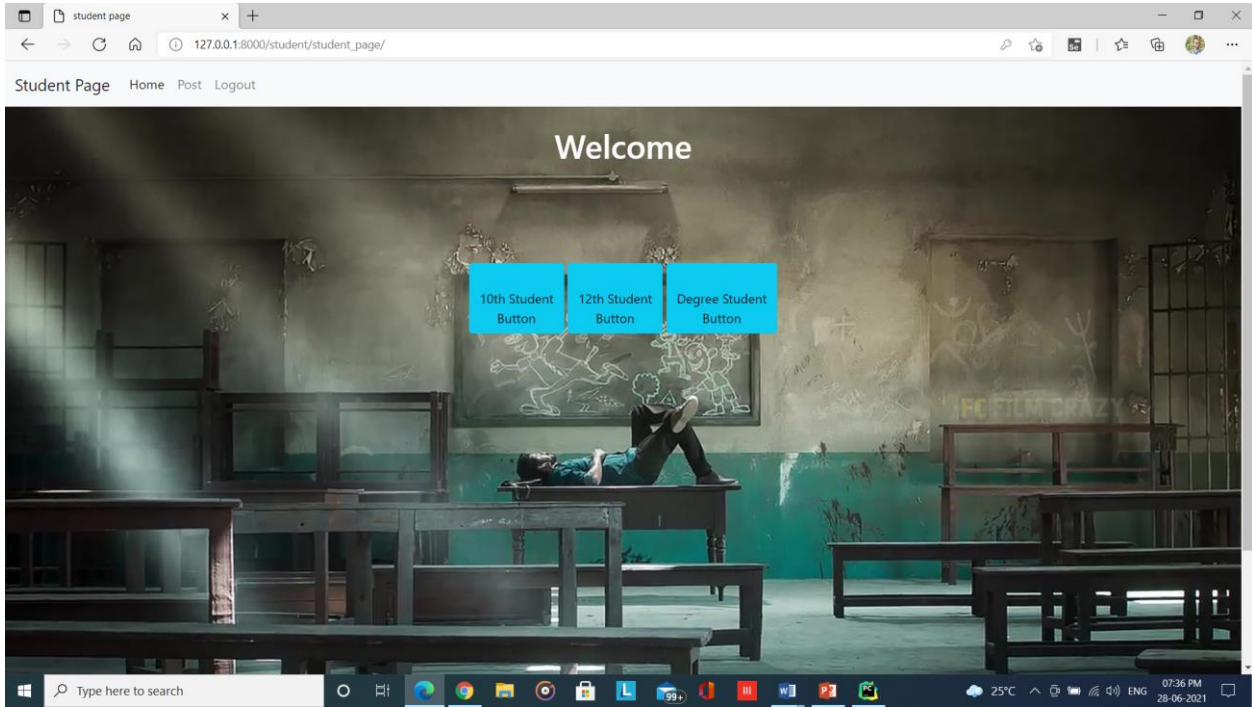
Success = {Prediction of student performance}

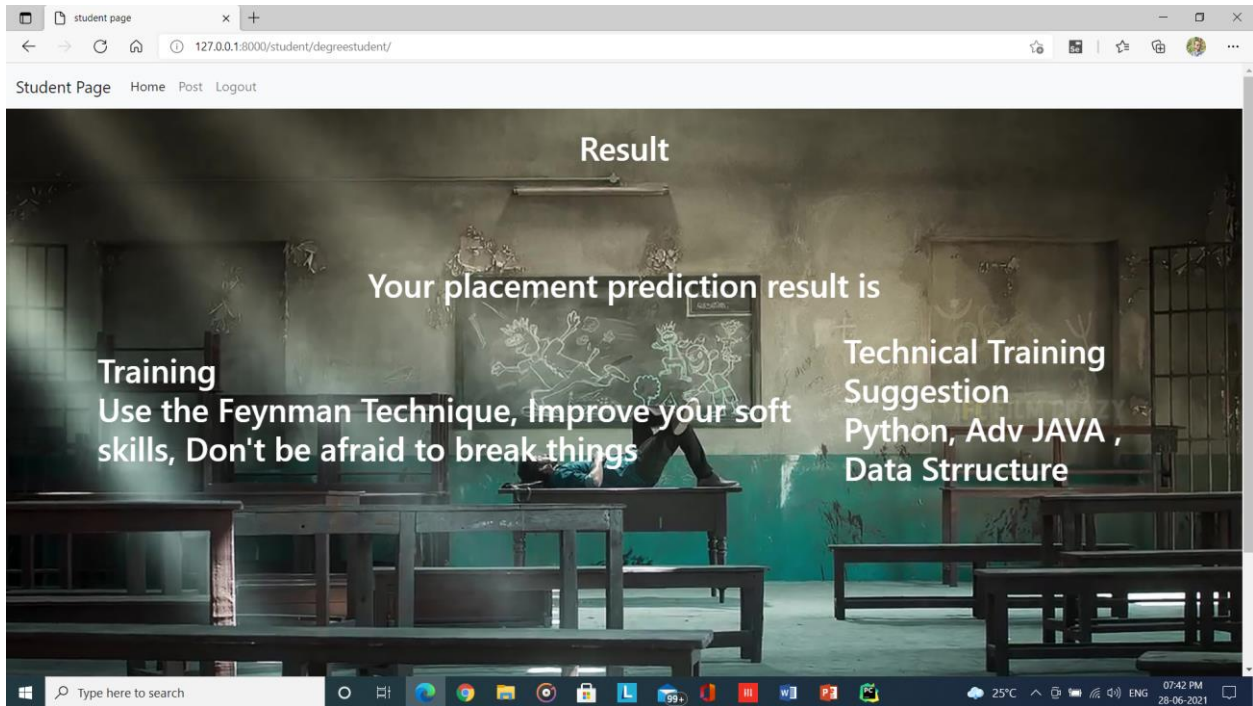
failure = {Fails to predict student performance}.



VIII. PROJECT SCREENSHOT







IX. ADVANTAGES

- Student can get the guidance through which he will get idea about in which field he has scope by analyzing his interests and academic performance.
- Student Performance prediction is very important to understand the student progress rate.
- Accessibility from any edge of the world just by having this system. As in this pandemic situation it is useful as no physical analysis will be done by teacher.
- Useful for teacher as she can save time that will be needed to analyze each and every student.

X. APPLICATION

- Student Performance Prediction can be used in multiple ways by student as well as the teacher.
- From this student can get a suggestion for his future activities. For example, if a Engineering student is using this he will get the suggestions of companies according to his performance and interests.
- Can be used by teacher if she has a huge number of students which may lead to save time.

XI. CONCLUSION

• Present studies shows that academic performances of the students are primarily dependent on their past performances. Our investigation confirms that past performances have indeed got a significant influence over students' performance. Further, we confirmed that the performance of neural networks increases with increase in dataset size. Machine learning has come far from its nascent stages, and can prove to be a powerful tool in academia. In the future, applications similar to the one developed, as well as any improvements thereof may become an integrated part of every academic institution.

XII. REFERENCES

1. S. Kotsiantis, C. Pierrakeas, and P. Pintelas, "Preventing student dropout in distance learning systems using machine learning techniques," AI Techniques in Web-Based Educational Systems at Seventh International Conference on Knowledge-Based Intelligent Information & Engineering Systems, pp. 3-5, September 2003.
2. B.K. Bharadwaj and S. Pal. "Data Mining: A prediction for performance improvement using classification", International Journal of Computer Science and Information Security (IJCSIS), Vol. 9, No. 4, pp. 136-140, 2011.