



IJIRCCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 10, Issue 5, May 2022

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.165

 9940 572 462

 6381 907 438

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Prediction of Student Performance using Machine Learning

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ABSTRACT: Early prediction regarding students' progress help teachers to improve their learning strategies, or parents to take precautionary steps by identifying the root cause of degradation or improvement of a student performance by applying Machine learning algorithms. We applied Support Vector Machine (SVM), KNN & Logistic Regression algorithms to predict the students' performance outcome in final exams.

KEYWORDS: Machine Learning, Support Vector Machine, KNN, Logistic Regression, Python.

I. INTRODUCTION

There are various external factors based on which students' progress depends like parents' education, living area, family relations, study area, friend circle, attendance, love towards studies, father's job, health condition, and prior failures. With the help of Machine learning's classification algorithm, we are going to predict if the student is going to pass or fail in the final exam. These models will be utilized on students' future exams, and if the model predicts that a student is more likely to fail in an exam, then precautionary steps will be suggested by the system.

II. MOTIVATION

- A. Incurrent system, the performance of students is understood post exam therefore students suffer from consequences like failure in exams, frustrations.
- B. So, I came up with an innovative approach that predicts low performing students early and instructors, parents and students can keep track of their students' progress and adjust their tactics accordingly.
- C. Objectives
 - a. To predict whether a student will pass or fail in the final exam.
 - b. To come up with the most accurate classifier
 - c. Understand both positive and negative factors those affect a student performance

III. PROBLEM STATEMENT

Currently, there is not any way to accurately predict and recommend student performance before the final exam. Focus is more towards cream of the class and not to the back benchers in terms of grades. Teachers, parents and students can't identify student's weakness and hence students suffer from lack of correct guidance and corrective actions.

IV. REVIEW OF LITERATURE

1. **Paper:** A Robust Performance Degradation Modeling Approach Based on Student's t-HMM and Nuisance Attribute Projection

Author: HUIMING JIANG 1 , JING YUAN 1 , QIAN ZHAO 1 , HAN YAN 2 , SEN WANG 3 , AND YUNFEI SHAO 1

Description: Performance degradation assessment (PDA) is of great significance to ensure safety and availability of mechanical equipment. As an important issue of PDA, the robustness of the trained model directly affects the assessment efficiency and restricts its application in practice. This paper proposes a robust modeling approach based on Student's t-

hidden Markov model (Student’s t-HMM) and nuisance attribute projection (NAP). NAP can remove nuisance attributes caused by individual differences from the feature space. Student’s t-HMM utilizes the finite Student’s t-mixture models (SMMs) to describe the observation emission densities associated with each hidden state, which can be more tolerant towards outliers than conventional HMMs.

2. **Paper:** Educational Data Mining: A review of evaluation process in the Elearning

Author: Marcos Wander Rodrigues, Luiz Enrique Z´arate, Seiji Isotani

Description: Due to the growing interest in e-learning as an important process of teaching and learning, new mechanisms to evaluate its pedagogical effectiveness are necessary. This review describes the scenario of 20 years corresponding to data mining research where the context is the e-learning and the main subject is the evaluation aspect, which is considered a latent problem within this environment. Our goal is to provide an unexplored review of EDM research of the teaching and learning process considering the educational perspective.

3. **Paper:** Identifying Dominant Characteristics of Students’ Cognitive Domain on Clustering-based Classification

Author: Yuni Yamasari^{1,2*} Supeno M. S. Nugroho^{1,3} Kayo Yoshimoto⁴ Hideya Takahashi⁴ Mauridhi H. Purnomo^{1,3}

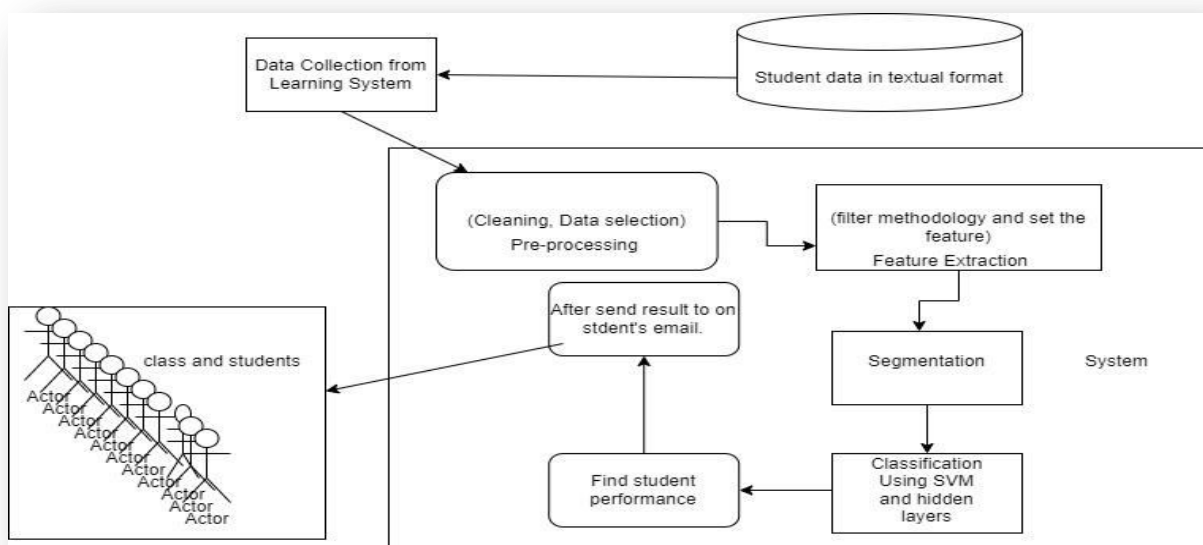
Description: The rapid growth of information and communications technology-based educational tools generates a large volume of student data with many features (characteristics). However, the mining process in the clustering task of student data is not often done optimally, so the performance of the system decreases. To overcome this problem, we propose a discretization method on logistic regression to determine the most optimal number of clusters.

V. PROPOSED METHODOLOGY

Algorithm used in proposed system are as follows:

- SVM Algorithm
- Logistic Regression
- KNN Algorithm

Architecture:



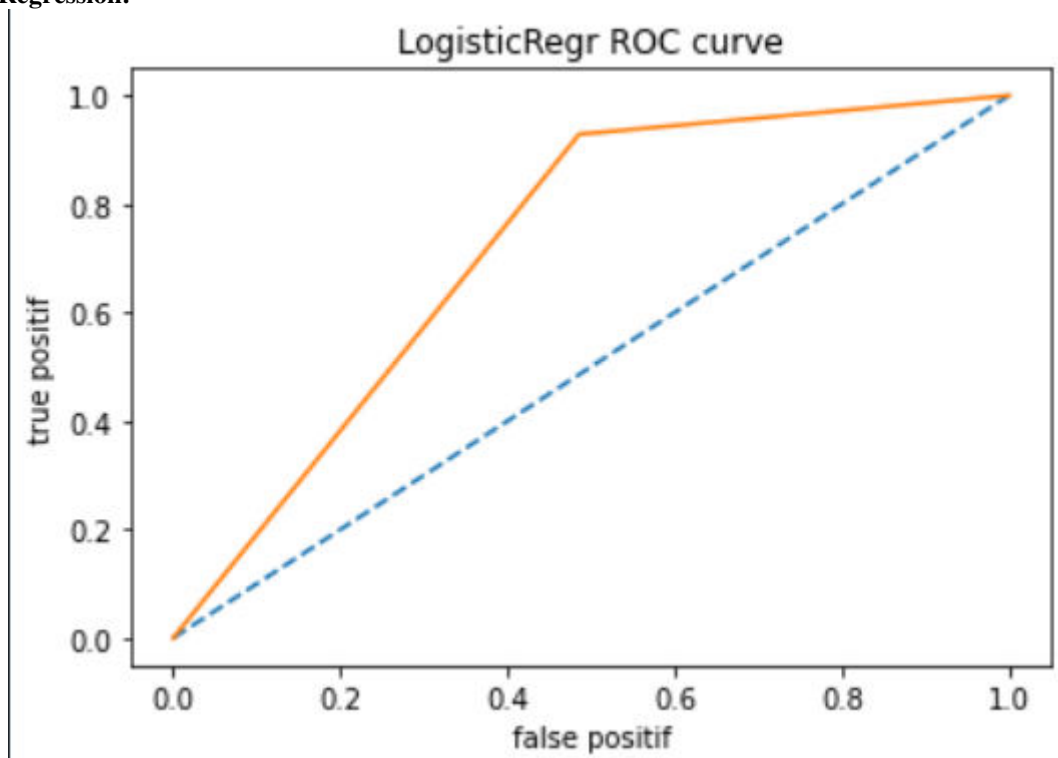


VI. RESULT AND ANALYSIS

6.1 EVALUATION PARAMETERS

Testing Please find below the evaluation parameters like Accuracy, F1-Score, ROC curves and Recall details:

Logistic Regression:

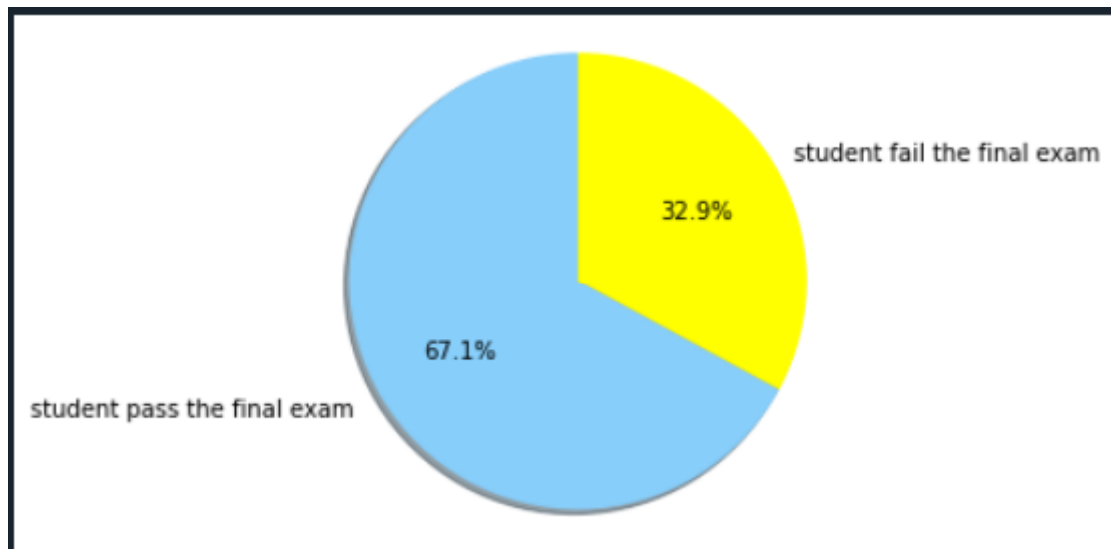
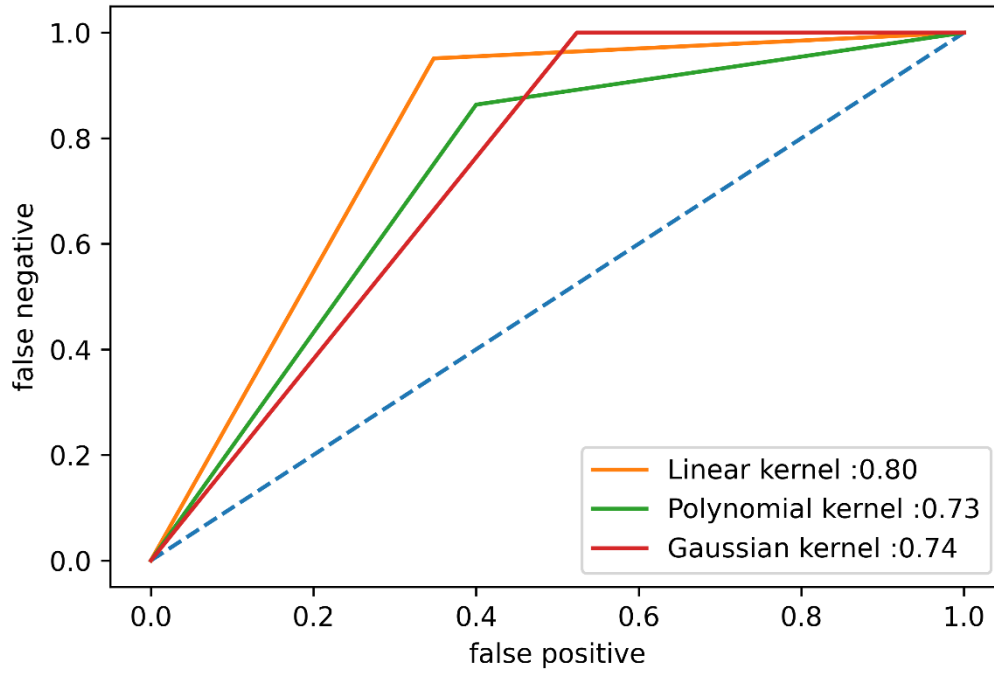


KNN algorithm:

```
*Accuracy is: 77.31092436974791
*f1 score is: 0.46988945718528297
random_state is 35616184
```

SVM ROC curves:

Comparison of three ROC curves



VII. CONCLUSION

Out of 3 Machine learning algorithms KNN, Logistic Regression and SVM, we observed that SVM has given the best accuracy. Thus, we predicted whether the student will pass or fail. Please find below alerting observations:

Factors helping students to succeed:

1. Parents education
2. Wants to take higher education
3. Study time
4. Parents job

Factors dragging students towards failure:

1. Health
2. Absence in the classes
3. Friend circle
4. Earlier failures

Advice / Recommendation:

Students:

1. Increase study time
2. Build good friend circle
3. Attend classes

Parents:

1. Create positive environment for study
2. Get educated

Teachers:

1. Inform parents about frequent absence in class
2. Identify root cause behind frequent failures

Government:

1. Provide internet & other facilities

VIII. FUTURE SCOPE

In future, we will predict the candidate's performance when they are appearing for interviews in the companies. And based on their performance candidates will be referred to the right job in the same company rather than getting rejected if the candidate is not suitable for 1 particular job.

REFERENCES

1. University disciplines..and the structure of the labor market- Economic newspaper,"2019.[Online]. Available: <http://www.aleqt.com/2018/07/16/article-1420651.html>. [Accessed:30-Oct-2019].
2. N. A. Yassein, R. G. M Helali, and S. B. Mohomad, "Predicting Student Academic Performance in KSA Using Data Mining Techniques," J. Inf. Tech-nol. Softw. Eng., vol.07, no.05, 2017.
3. A. Mueen, B. Zafar, and U. Manzoor, "Modeling and Predicting Students' Academic Performance Using Data Mining Techniques," Int. J. Mod. Educ. Comput. Sci., vol.8, no.11, pp.36-42, 2016..
4. H. Almarabeh, "Analysis of Students' Performance by Using Different Data Mining Classifiers," Int. J. Mod. Educ. Comput. Sci., vol. 9, no. 8, pp. 9-15, 2017.
5. M. Al-Saleem, N. Al-Kathiry, S. Al-Osimi, and G. Badr, "Mining Educational Data to Predict Students' Academic Performance," Springer, Cham, 2015, pp.403-414.
6. R. Asif, A. Merceron, and M. K. Pathan, "Predicting Student Academic Performance at Degree Level: A Case Study," Int. J. Intell. Syst. Appl., vol.7, no.1, pp.49-61, 2015.



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Impact Factor: 8.165

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