Abstract: Calculating the student performance is most widely done in many institutions. It is very important for every institution to collect the performance of the student based on marks secured. Previously classification and clustering also used to get the results. The dataset used in this paper is student dataset with all student details such as name, marks, address etc. In this paper various machine learning techniques are implemented and analysed the performance of the student. Results show the comparison of the proposed system.

Index Terms: Student performance, educational data mining, performance prediction.

I. INTRODUCTION

The upcoming of information improvement in various fields has lead the wide volumes of data gathering in distinctive affiliations like records, reports, archives, pictures, sound, accounts, sensible data and distinctive new data social events. The information amassed from various applications require fitting framework for expelling picking up from enormous reports for better crucial expert. Knowledge discovery in databases (KDD), routinely called data mining, goes for the introduction of strong data from tremendous accumulations of information [1]. The basic segments of information mining are applying unmistakable methods and algorithms so as to find and consider occurrences set away information [2]. Data mining and learning disclosure applications have a rich obsession because of its essentialness in crucial activity and it has changed into a fundamental part in different affiliations. Data mining strategies have been brought into new fields of Statistics, Databases, Machine Learning, Pattern Reorganization, Artificial Intelligence and Computation limits, and so forth. There are developing investigation premiums in utilizing information mining in direction. This new rising field, called Educational Data Mining, worries with making methods that find picking up from data beginning from edifying conditions [3]. Educational Data Mining utilizes different systems, for example, Decision Trees, Neural Networks, Naive Bayes, K-Nearest neighbor, and different others. Using these systems unique sorts of learning can be found, for instance, affiliation measures, groupings furthermore, pressing. The discovered data can be used for need concerning enrollment of understudies in a particular course, offense of standard classroom appearing, zone of uncalled for methodology used in online examination, ID of unconventional properties in the result sheets of the understudies, measure about students’ performance, and so on.

II. LITERATURE SURVEY

Dorina Kabakchieva [4] did same research in which he utilized depiction models made by utilizing four data mining tallies – One R Rule Learner, Decision Tree, Neural Network and K-Nearest Neighbour. The most ridiculous accuracy is developed by utilizing neural structures looked for after by Decision Tree model and K-NN show up. The Neural system show works better with the "Strong" class while other three worked amazingly with "Weak" class. The after effects of the entire model are separated and others for equivalent characteristics and data set.

Baradwaj and Pal [5] proposed an examination on around 50 understudies who attempted the course for a time span of 4 years with attributes like “understudies last semester grades”, “reliably centers”, “lab assignments”, “support”, “last semester marks, and so on. They brought into utilization of the ID3 Decision tree for social occasion of understudy's information and a brief timeframe later build up a choice tree for precise figure of understudy's execution. Their standard point was to concentrate on the fields in which the understudy was horrible and decline the slip-up degree. They brought into utilization of the ID3 Decision tree for looking at the understudy execution since it is the most direct learning calculation. Abeer and Elaraby [6] in addition completed a fitting examination to organize and predict scholarly execution of a get-together of individuals over a time span of 6 years with different of highlights amassed from educational affiliations. As a yield, they could foresee the appraisal of understudies in the specific course and even can improve his execution by taking preparing in fragile fields to keep away from disappointment degree. Amjad Abu Saa [7] examine accepted that student’s performance relies upon scholastics similarly as rely upon other individual, social and additional curricular exercises. He close by Naïve Bayes estimation utilized three choice tree calculations for game-plan of information.
Specifically off the bat he completed an examination and amassed understudies information and a brief timeframe later pre-processed and investigated the information for data mining tries. In like manner, the data mining estimations were executed on the educational record to convey gathering models for foreseeing understudy's execution.

The examination work wrapped up by Ali Daud and Farhat Abbas [8] presents the understudy enlightening want process that utilizes four different kinds of characteristics explicitly: family use, family pay, understudy particular data and family resources. It adjusts the philosophy for trademark subset affirmation so as to see the most fundamental highlights for understudy informational execution figure. It is clear from the relative examination that their recommended characteristics are doable markers and accomplished F1-score on genuine understudy's information. They finished from the outcomes that family usage and individual data qualities basically impact the execution of the understudy in light of regular reasons.

**III. PROPOSED SYSTEM**

**A. Data Mining**

Data mining is generally called the system of Discovery of Knowledge which suggests removing or mining information from tremendous gathering of data. It helps in choosing enchanting learning, for instance, anomalies, changes, affiliations, plans and basic structures from enormous volumes of information set away inside a couple of different kinds of databases as in data dispersion focuses or other information files [9]. It's been noticeably used nowadays due to the availability of colossal volumes of data in electronic structure and there is a prerequisite for changing over such data into accommodating information and learning for immense applications. Decision Support, Artificial Intelligence, Machine Learning, Statistics and Database Systems and Business Management are a segment of the fields using its applications [10]. These procedures are used to chip away at enormous proportion of data for finding covered models and associations pleasing in essential initiative. While data mining and learning divulgence are commonly treated as same, data mining is extremely a vital bit of the information disclosure process. The all around requested strategy required for isolating information from data are showed up in Figure 2.

**B. Classification**

Classification computation is a data mining methodology that makes us map into predefined grouping. It is a managed learning methodology which needs arranged planning data so it can making rules for characterizing test data into pre-sorted out order. [10] Its a 2 organize methodology. The fundamental stage as the learning stage, where the gathering rules are made and getting ready data is dismembered. The second stage as the game plan arrange, where test data is portrayed into predefined clusters as shown by the made rules. Since gathering counts requires predefined classes reliant on estimations of information section, we had made a section "execution" for all understudies, for which they may have an estimation of either "Extraordinary" or "Horrible"'.

**C. Clustering**

Clustering algorithm generally means grouping certain course of components with the end goal that the components in a comparative cluster are more similar to one another than to those in various arrangements [9]. A couple of fields like pattern recognition, picture examination, machine learning and information recuperation insinuate this as a run of the mill strategy for authentic data examination. Clustering should be conceivable by a couple of systems that differentiate between the similar properties required between segments of a gathering and how to successfully find the segments of the clusters.

**D. Classification over Clustering**

In strategy of execution of clustering various classes can be found from the data and are examples of cloud apriori. As our major point is to separate understudies' execution into any of the predefined level - "Extraordinary" and "Bad", for which gathering was not reasonable, so we have used course of action method rather than clustering procedure.

**E. Prediction of Results**

Regression procedure can be used for looking at as regression examination can be used to show the association between one or more dependent and independent variables.
Unfortunately, various authentic issues are not only a prediction. A comparable model can be used while predicting results for both regression and classification. For instance, the CART (Classification and Regression Trees) decision tree figuring can be utilized to manufacture both course of action trees (to gather out and out response factors) and backslide trees (to assess endless response factors). Neural frameworks procedure can be used to make both classification and regression models.

F. Accuracy Measurement
Breaking down which technique for data mining is extraordinary altogether depend on how the customers has kept an eye on the issues. Generally every system execution is looked into by examining the precision of the results. Exactness estimation in Classification technique is done by choosing the dimension of set tuples morally justified class. Meanwhile, there might be some cost related with each off base undertaking to the wrong class which can be neglected.

IV. METHODOLOGY
We will describe algorithms that we have used to analyse student performance. Firstly, the dataset used for this research. Secondly, the attributes. Then about the algorithms linear regression, recursion and partition trees, support vector machine (linear and non linear).

V. EXPERIMENTAL RESULTS
A. Linear Regression
Linear regression is a key calculation and ordinarily used to imagine examination. This fall away from the faith measures are utilized to clear up the relationship between one ward variable and something like one independent segments.

B. Recursive Partitioning
Recursive partitioning wound up being especially worshiped and wide utilized tools for nonparametric regression and classification in several scientific fields. Particularly random forests that may alter gigantic measures of pointer factors even inside the closeness of front line affiliations are related with accomplishment in genetic science, clinical arrangement and bioinformatics at breaks the recent years. The motivation behind this work is to show the rules of the quality algorithmic dispensing ways still as late procedure upgrades, for instance their utilization for low and high dimensional data examination, regardless in like manner to indicate controls of the ways and potential catches in their application. Usage of the ways is depicted abuse clearly offered use inside the R structure for applied math computing.

C. Support Vector Machine (SVM)
The Support Vector Machine can be seen as a kernel machine. Thusly, you can change its direct by utilizing an other piece work. The most important kernel limits are

- the linear kernel
- the polynomial kernel

D. Linear
The linear kernel is reliably prescribed for text classification. Content is regularly straightforwardly indisputable. The majority of substance plan issues are straightforwardly discernable. Linear kernel is indeed very well suited for substance strategy. Remember regardless that it isn't the standard strategy and for some condition utilizing another part may be better. The embraced framework for substance ask for is to attempt a straight piece first, in context on its extraordinary conditions. If however you search to get the best possible classification performance, it might be interesting to try the other kernels to see if they help.

E. Non-Linear Kernel
With what we have appeared of quite recently, data sets that are linearly separable(maybe with a few uncommon cases or some perplexity) are particularly managed. Regardless, what are we going to do if the educational record fundamentally doesn't permit depiction by a linear classifier? Enable us to take a gander at a one-dimensional case. The best instructive rundown is quick depicted by a straight classifier but the middle data set is not. We rather should probably choose a between time. One approach to manage this issue is to plot information on to a higher dimensional space and after that toutilize a linear classifier in the higher dimensional space.

F. Decision Tree
It is a Supervised algorithm which initially reads and learn about the data and with the help of term a parameter e.g. Entropy we make decision about splitting of nodes and we finally construct a tree structure. And it will predict result for new sample. In the final tree structure each path represents a rule. We have different packages like Ctree, rpart etc. in R to implement decision tree.

G. Naïve Bayes
This technique is based on Bayesian theorem, in this we assume that there is no relation between the attributes that are present i.e.
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every attribute in the data set is independent. In this we use a mathematical concept called probability, with these probabilities we can predict the output. In this we use different probabilities like likelihood, prior probability etc.

Fig 3. Decision Tree Final Tree Plot using ctree

Fig 4. Decision Tree Final Tree using rpart

Fig 5. Prediction Table of Naïve Bayes

Fig 6. Naïve Bayes Output

Fig 7. Plot for Naïve Bayes

Fig 8. Random Forest Final performances

Fig 9. Confusion Matrix for Random Forest

Fig 10. Recursion Partitioning Final Tree
VI. CONCLUSION

This paper explains about importance of utilizing machine learning systems for predicting students performance. Educational data mining is a rising field in research a region. It helps to analyze student information and give accuracy of various algorithms. In this paper, the performance based on the accuracy is shown. From the algorithms we used SVM linear has more accuracy. The SVM Linear shows the higher accuracy.

FUTURE SCOPE:
Not only the algorithms that used in this paper, there are good number of algorithms so, this paper can further extended by using many other algorithms for suggesting algorithm which is more accurate than the algorithm proposed in this paper, this can also be extended for suggesting which algorithm is more effective in terms of space and time complexity.

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