Hostel Amenities Management System Using Decision Tree Algorithm

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***Abstract*— In recent years, the plethora of institutions for education has been enhancing promptly. Many leading institutions stumble to benefit from the augmenting number of students. Subsequently, the conventional system has to be kept up with hands, and maintaining and retrieving the material was tedious and lengthy. This Hostel Management System employs the decision tree algorithm, which is accessible to the management. Decision trees assist in designating students according to their academic accomplishments and allocate study hours accordingly. It implicates congregating data of students' marks, possibly from previous semesters, and using that data to train the decision tree model. Once trained, the system can predict the study hours integral for students according to their current marks or academic performance. This paper explains how to reduce manual workload and streamline hostel allocation for administrators. This paper also induces features like student registration, updating records, room allocation, user management, attendance management, out-pass generation, tracking and managing information of the hostel, fee status, handling student facilities, and evaluating the student's performance by employing the decision tree algorithm, the aim is to reduce administrative efforts, enhance student services, and improve academic performance. The implementation of this system is to reinforce accuracy and security to equip a centralized repository for critical hostel data. The evolved system is more user-friendly, efficient, and secure.**

Keywords— Decision tree algorithm, ID3 algorithm, Hostel Management, Machine Learning

I. INTRODUCTION

The decision tree algorithm is an ideal choice for managing a hostel due to its ability to handle complex decision-making processes based on multiple input variables. By constructing a tree-like structure of decisions and their potential outcomes, the algorithm can effectively analyze various factors influencing student's academic performance and study habits. These components can encompass former academic grades, attendance records, participation in extracurricular activities, and even personal preferences. Unlike traditional rule-based systems, decision trees offer flexibility and adaptability, allowing the hostel management system to accommodate diverse student profiles and adjust study hour allocations over time. Additionally, decision trees provide transparency into the decision-making process, enabling students and administrators to understand the logic behind study hour assignments and fostering conviction in the system's recommendations. Overall, the decision tree algorithm is a powerful tool for optimizing study hour arrangements within the hostel environment, facilitating personalized support for each student's academic journey.

A decision tree is one whose branch node can fall as an evaluation of the input data model and whose leaf nodes can eventuate as classification (of these models). These evaluations are sieved down through the tree to get the authentic yield to the input model. Classification Tree algorithms effectuate and utilize within the bailiwick. Multitudinous classification tree algorithms abide as a substitute for enumeration procedures to find data, pull out text, find lost data in a class, enhance the gateway, and also find various supplications in medical fields. Numerous classification tree algorithms can be employed. They have distinct accuracy and are worthwhile. It is likewise crucial for us to know which algorithm is most desirable. The ID3 is one such former Decision tree algorithm. Examine the effectiveness of agile methodology when applied to machine learning projects against ordinary software projects.

Managing student accommodations and related tasks within educational institutions is greatly facilitated by the Hostel Management System (HMS). In line with the technological advancements and the evolving needs of hostel administration, this project presents a comprehensive solution leveraging the django framework and incorporating a decision tree algorithm for intelligent study hour arrangement and room allocation. This Hostel Management System aims to benefit hostel administrators by enabling them to efficiently store information about students, their rooms, and various facilities. It eliminates covets for cumbersome physical record-keeping, facilitating the monitoring of detailed information of both past residents and new arrivals in the hostel. Identifying the problems of the existing hostel management system induces the evolution of better software solutions that will be agreeable to the traditional hostel management system with a viable alternate effective solution that is more user-friendly and GUI-oriented. We can enhance the efficiency and precision of the management of hostel facilities by overcoming the disadvantages of the existing manual system management using computerized equipment.

Currently, all hostel operations are conducted manually, resulting in frequent repetitions and placing significant strain on hostel administrators. Software solutions are not commonly utilized in these settings, adding to the quandaries faced by those managing hostels. This paper aims to address the difficulties associated with manual hostel management and overcome the problems encountered during manual data retrieval processes. By identifying the shortcomings of the current system, the goal is to get on well an automated system that seamlessly integrates with the existing infrastructure, providing a more user-friendly approach to hostel management.

This orderliness has been fabricated to assist the hostel management team in efficiently handling and managing student accommodations. As an administrator, you can log in and access comprehensive statistics of students who have applied and registered for hostel accommodation. By auditing the eligibility and assign them to available hostel facilities. This panacea also entitles you to retrieve data on students who have left the hostel in previous years. It streamlines the entire process, making it easier to manage student accommodations effectively.

II .Literature Survey

The decision tree classification technique is accomplished in two stages: tree building and pruning. Tree building moment follows top to down manner. Throughout this stage, the tree is continually segregated until the data items belong to the same class label. This stage is very monotonous and devours a lot of computation processes since the training data set is constantly reprocessed. The tree pruning stage is done in a bottom-up manner. This practice is accomplished to enhance the forecast and classification precision results of the algorithm by diminishing over fitting (noise or substantial detail in the training data set). Over fitting may result in misclassification errors in the decision tree algorithm.

In a categorization task, the intent is to allot a predestined label or class to a record based on a set of amicable attributes. An overriding trademark of a classification model is that it is assembled by part of the data, also known as the training set, which is used to command the model. All the attributes in the subclass are avowed, even the class. To assemble the models, two techniques are used: DT

and FGA. A DT is a portrayal made of nodes and areas where a branch node presents a decision based on attribute values and the arcs stand for the option made in the node. It ends on a leaf node, which portrays the label or the class to be assigned. To segregate a record with DT, it commences from the root node and moves one level down at a time contingent on the outcomes of the provisions tested on every node, when it ends on a leaf node, the record is designated according to the label on the leaf node. The total mass is deliberate and depicted as the admission score. Academic revelation involves attendance, two conclave marks, assignment marks, and internal marks. Internal marks are an amalgamation of standard marks obtained from two conclave exams, assignment marks and attendance. From the forecast, students who pass a subject are distinguished. The outcomes will authorize educational institutions to intensify the superiority of up skilling after appraisal of the marks scored by the students in an academic year. Student's adept areas can be added by lecturers, which helps recruitment companies.

This paper came up with the ID3 decision tree algorithm as a classification model to foresee the student's division, the earliest information such as attendance, seminar, class test and assignment marks were collected of the student's earlier records to forecast the recital at the end of semester. All this assisted the students and the teachers to upgrade the division of the students. They Suggested a classification model using decision tree algorithm to choose the felicitous academic lane for the students, This model is essential for school management to choose the felicitous academic lane for a student based on the previous student's data and alike academic achievements of the students and suggested a blended approach of clustering and classification to improve the student academic performance in their final examinations. At first students were categorized into three categories high, medium, and low standards and then put in a decision tree algorithm to take pertinent decisions for the students. They compare the predicted results and actual results which designates, that there was a significant improvement in results as the prediction succored a lot in recognize weak and good students and help them score good marks. They also collate the model with the ID3 decision tree algorithm and demonstrate that the developed model is better in terms of effectiveness and time taken to build the decision tree.

It was perceived from earlier studies that students' academic procure and training performance have been overblown by numerous strands including gender, age, teaching methodology, student's result's, environmental effects, parents' socioeconomic status, study pattern, tuition trend, and, the time reticent for study, accommodation. Countless academics have carried out in-depth inspections of the variables influencing student success at several study levels. Higher education institutions have been intended in students' academic performance and graduation rates. In the higher education community, testing on the variables that affect university students' academic success is becoming growingly approved. Recently, an analysis disclosed how variables like gender, learning styles, and race affect student performance. The paper's information, including the algorithms, datasets, and results obtained, are rigorously assessed and presented. To further peak the authors' topics and determine the most accurate classifiers, all of the approaches examined were also discussed. As a result, the applications of various data set kinds are prospected, and the results are examined.

The rise in online classes and educational institutions have been handle and continue to be made easier by advances in computer-arbitrate communication technology. The most remarkable aspect of this study is to competently transform data into facts to inspect and forecast the future performance of students by knowing from earlier data. Although it was easier to measure student performance in an on-campus environment, computing student performance in the online environment is equally arduous. One of the most well-liked predictive modeling techniques is the decision tree, which is used for predicting and classifying a given data object based on a previously engendered model. ID3, CART and J48 were the most effective decision trees used for classification basis in predicting students' performance. A decision tree produces sequences of rules that help for decision-making. Persistently, investigator generated rules from envisaged decision trees for a better grasp of the most influential attribute and also of the result.

This paper introduced a model for hostel accommodation system based on fuzzy deduction in decision making which was implemented using server side scripting language (PHP) in conjunction with MySQL being used as the relational database and Apache serving as the Web server. This model used fuzzy logic rather than Boolean logic in making decision. They utilized probing approach to solve hostel space assignment problem in higher establishments of learning. It is a amalgamation streamlining issue that includes the dissemination of spaces accessible among an positioning of meriting substances (rooms, bed spaces, and office spaces and so forth.), with the goal that the reachable spaces are ideally used and agreed to the given positioning of imperatives. Hill climbing simulated tempering, late obedience hill climbing and were connected to circulate the understudies at all the three levels of distribution. At each level, a correlation of the calculations is displayed. Here they are not predicting students' performance.

We have fabricated a fount code to help proliferate the Online Smart console for Hostel Management pursuits. It plummets the endeavors made by the hostel warden and hostel squire while presiding over the hostel. It detaches the pen-paper idea that has been resorted to by us ahead. The fabricated chassis gives tinctures for enchiridion hostel senate issues and gives data for instance- hostel evidence, hostel room evidence, hostel accounts evidence, etc. It is an accessible programming site so everyone can get to it from any place with no volatility with the aid of a working web coalition. This project directs the concerns of trafficking with a hostel and stays apart from the concerns that happen when pawed manually. Designing a non-manual system with an adaptable GUI, and coherent performance by identifying the pitfalls of the concrete system will help to prevail over the hitches of the concrete system.

This system is delineated in the appellation of the hostel management which assists them in organizing and saving the records of the students about their rooms and supplemental things. The preferred prosecution software manages the gubernatorial work by enhancing its amenities for all the students of the hostel. The verbosity of data may transpire and this may lead to this variability. The somatic system is so unvarying process. The preferred system is very tranquil to wield. There is no verbosity of data. Currently, validation and consent are the key hallmarks for the smooth operation of directorial departments in various realms. Identification is the way of shaping a solitary identity whether he or she is a defend-able user or not. Consent is the process of presuming attainability to resources affiliated to information safe future and computer certainty.

Hostel Chambers Management System is an intuitive computer-based system for superintending hostel amenities in institutions. It has been designed to computerize, manage, and look after the inclusive processing of records of students

occupying a large hostel. Thus, to build up the conducting of hostel provisions, at hand stipulation for the application of efficacious refining methods and scheduling blueprints parenthetically the authority managing the provisions. The proposed system inscription the hitches of the existing system and clinches data rectitude. This project is pursued by prospering a system for safekeeping records and exhibiting information about a hostel. This system will oblige the hostel executive to be able to supervise the occurrences of the hostel. This system will impart full intelligence about a student in the hostel. It will appear whether rooms are available or not and whether several people are in an isolated room. This will also provide information about students who have been remunerated in full or are still payable. This system will also yield a report on the compendium detail concerning fees and tallies students are paying. Also embraced is a user chunk for artisans or the hostel admin.

Arrogating the caliber of manual scheduling tasks for facility oversight is a quotidian practice in the bulk institutions here in the flourishing world. This method is categorized by diverse drawbacks, some of which are human fallacy, squat security, data prolixity, toil in management, toil in data re-equip, toil in record tutelage, toil in data betterment in case of holocaust, etc. The major unbiased of the proposed system is to assist automate root hostel management pursuits. The root hostel management pursuits comprehend pursuits like:

- Thrust the student's particulars and further records.
- Room budgeting for the padrones.
- Student's gesture spooring.
- Out-pass solicitation for the students.
- Providing data probity of the admin using Acquiesce in login.

III. PROPOSED WORK

A decision tree algorithm helps to calculate students' performance. It is a tree-like structure that shows the predictions which result from a series of feature-based splits. Decision trees are simple to understand and can be easily visualized. The logic behind the decision tree is facile to understand as it includes a flowchart tree structure, and it is very similar to human thinking while making a decision. A decision tree consists of categorical data that includes yes or no. It also shows the numerical data. Most importantly, the decision tree algorithm is exploited for classification. To calculate the students' performance, a decision tree is the best algorithm to work on and also better for human understanding as it gives the results well with the best accuracy.

3.1 Dataset

We have used a new dataset for the proposed model. This dataset contains the students' data along with their grades. We have collected the data from the students' records. This dataset includes certain important details of the student such as:

Registration number: It includes the unique identification number of the student.
Room number: This field shows which room the student belongs to.
Attendance: This feature displays whether the student is present or not.
Grade: This is the most prominent and required feature; it shows the grade of the student according to their performance in academics.

TABLE

Roll No	Name	Room	Attendance	Grade
20A81A0400	Supraja	12	In	9.00
21A81A0502	Snehaja	03	In	9.50
20A81A0545	Bindu	15	Out	7.50
20A81A0592	Esther	23	Out	9.20
21A81A0556	Priya	21	In	7.37
21A81A0565	Madhu	13	In	7.70

3.2 DATA PREPROCESSING

This involves tackling empty cells, handling categorical data, transforming the data, feature selection and extraction, splitting the data, normalization of data, handling imbalanced data, and data augmentation.

Module 01: Dashboard

In this application, the proposed dashboard aims to update the amenities processes by students attendance tracking like inside and outside the hostel and pass generation functionalities like Sunday out pass, day out pass, vacation pass and night out pass. The count will be increment when the students was risen by one, passes generated and tracking of both inside and outside attendance counts.

Module 02: Attendance

This module is unveiled so long as students exist within or outside the hostel. The count will be displayed in the dashboard, and the status of students can be seen in the attendance module. It dossiers the arrival and departure of the residents. If the students didn’t mark their attendance, their attendance is not shown, whether they were in or out of the hostel.

Module 03: Students

In this application, we created a module called Students. This module contains student information like name, branch, roll number, room number, phone number, fee status, attendance and percentage. If new student is willing to stay in the hostel then the administrator can add the student by using feature like add student. The feature contains student form.

Module 04: Allocation of Rooms

In this application, we created a module called room allocation. This module is exploited to allocate rooms for the newly joined students. This will be very helpful for the admin to allocate a particular room by entering and storing the related details of the student in the system. So that there will be no further confusion about allocated rooms or floors. This will help the administrator reduce manual work and time. By

storing the details in the database, there is no chance of redundancy.

Module 05: Out pass Generation

We developed out pass generation for the students. It includes different types of out passes such as Sunday out pass, day out pass, vacation pass and night out pass. The administrator handles all types of passes appeal by the students. The pass holds detail fields along with reason, date and time. Once the details filled by the administrator, then provides a print out to particular student.

Module 06: Fee Status

We generated a fee status module to check whether a student paid their accommodation fee or not. This fee status form includes only student roll number and status of fee. Once the details filled by the admin, the update will be appear in the students table.

ID3 is one of the decision tree algorithms. ID3 endures for Iterative Dichotomize 3. Dichotomization assets are isolated into utterly antagonistic feats. It wields a greedy technique to construct a decision tree from the liable dataset by hand-picking the finest hallmark at every instant for the fissuring. In this ID3 algorithm, we will take the training dataset as input and the expected output would be a tree list of nodes, tree edges, and tree leaves. This will tally the particulars reaped for each facet and opt for the lofty value. After facet preference, data is parceled out based on the merits of the facet. The algorithm receipts looping with barriers till only one division are left over in the barrier or no facets are remaining. Using this ID3 algorithm we are going to draw the output of students' performance.

Working of ID3 Algorithm:

Step 1: Detecting the most didactic facet

Step 2: Make a tree node with a facet name and facet values as limbs

- If sterling class, affixing the leaf node to the tree node

- If defiled class, affixing a protractible node to the tree node

Step 3: Diminishing or refurbishing the dataset consonant to the sterling class

Step 4: Affixing the node with limbs into a tree

Step 5: Protract the limb of the next defiled class to a refurbished dataset

Step 6: The recurrent terminus:

-The dataset becomes empty after refurbishing

-There is no protractible branch

There is a formula to calculate the student's performance using the ID3 algorithm; this algorithm uses a formula hinge on information gain. The algorithm opts for the attribute that imparts the utmost information gain at individual steps to snap the data into fragments. The Information Gain (INFOGAIN) is purposive using the successive formula:

INFOGAIN (DS, ATR) =EN (DS) − EN (DS|ATR)

From the above formula,

. INFOGAIN (DS, ATR) refers to information gain calculated by fissuring on attribute ATR in the dataset DS.

. EN (DS) refers to the entropy of the dataset DS.

. EN (DS|ATR) refers to the provisional entropy of DS given the attribute ATR.

To calculate Entropy (EN), the algorithm uses below formula:

EN (DS) = - (the sum from i equals 1 to n of PR(t value as i).log to the base 2(PR(t value as i))

From the above formula:

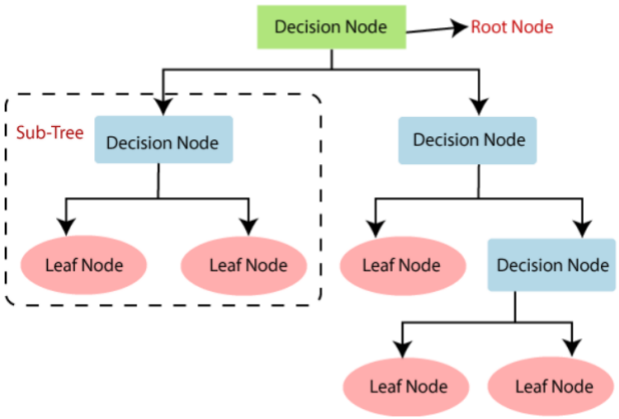
. N refers to the number of classes in the dataset.

. PR (t value as i) refers to the proportion of exemplars koshering to class t value as i in the dataset DS.

The ID3 algorithm recurrently solicits this procedure to create a decision tree by designating the attribute that intensifies Information Gain at individual steps.

When the ID3 algorithm pertains to the scrutiny of students' performance, the ID3 algorithm can proffer sundry dominances such as pinpointing dominant Factors, decipherability, steering disappeared Values, auguring Modeling, disorder Handling, Data probing, altering for contrasting goals, and allay of accomplishment.

There are both upsides and downsides to the ID3 algorithm. It lessens the number of tests to be performed by building the nimble tree; it is created from the training data. The entire dataset is examined to build a tree. The downside is that at a time, solely one attribute can be catechized. If only a tiny part of the data is tested, there is a potentiality that the data is exhibiting over fitting. Continuously classifying the data is quite expensive as numerous trees are generated, so it would be firm to handle such a scenario.



IV. RESULT ANALYSIS AND DISCUSSION

The system modules and how it operates are discuss below:

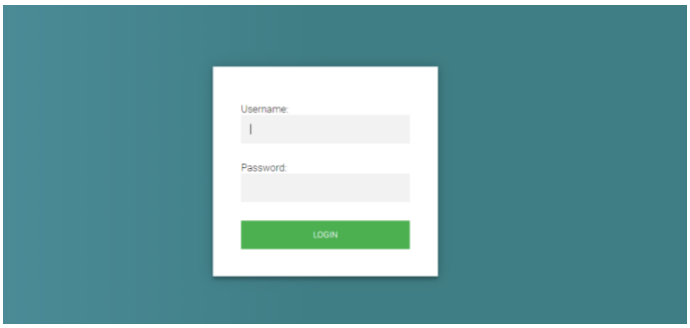


Fig 4.1: Admin's Login page

The login page (Admin) is the first page that opens to an admin as the admin logs on to the website. This page is used to receive and confirm the administrator credentials before granting access to the system.

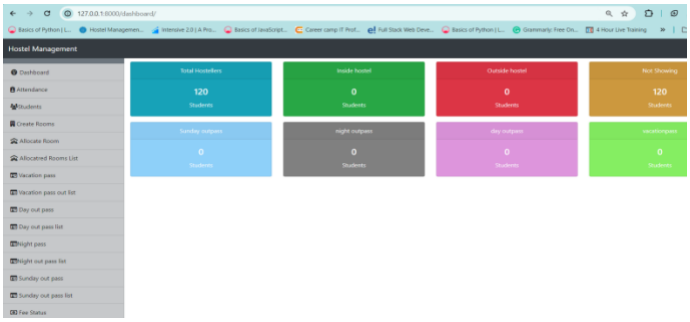


Fig 4.2: Admin's Dashboard Screen

The administrator dashboard shows the possible operations the admin can perform on the system along with some basic information such as count of the number of hostelers, count of number of students who are inside and outside the hostel and count of number of students who applied for different passes.

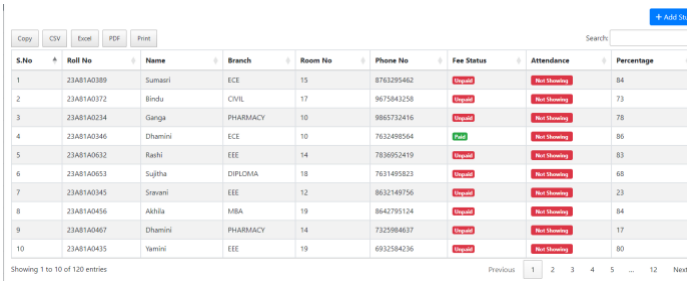


Fig 4.3: List of students in hostel

This List will be displayed when ever we click on the total no of hostelers card and also when we click on the students module here we can add newly joined hosteler in the hostel and can download the list in any file format.

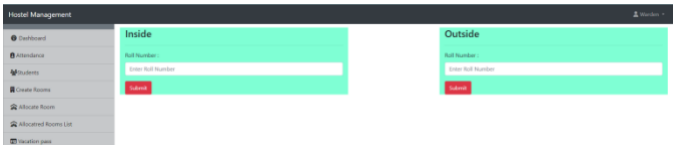


Fig 4.4: Attendance of the student

In this module there will be check-in and check-out of a particular student whether he/she is inside the hostel or outside the hostel or else it will show "NOT SHOWING" status for who didn't enter their roll number while entering the hostel.

Fig 4.5: Creating Rooms

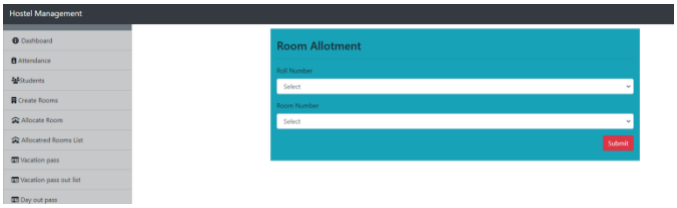


Fig 4.6: Allocating Rooms

Fig 4.7: Room Allocation List

From the above 3 images we have depicted that first we check the room availability and then we will allocate room for a particular student and automatically the list will be updated with the student and his room details.

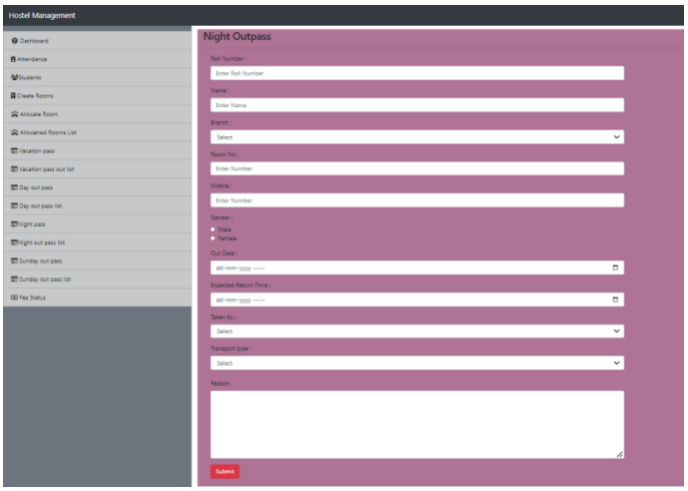


Fig 4.8: Out pass Application

This the most vital feature in our application. When a student want to go outside the hostel he should show the pass at the gate and that pass should be approved and issued by the warden. The warden should fill the form with the student details who wants to go outside and generate the pass for the particular student.

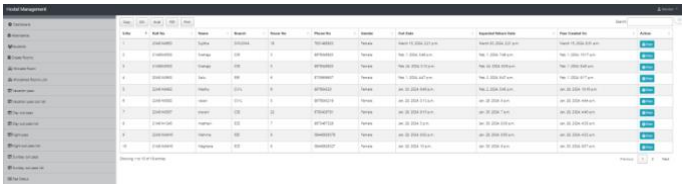


Fig 4.9: Out pass List

This image depicts that how many students have applied for the out pass until today. And Admin can click on the print button at particular student who had applied for the pass recently and can make a print out of the pass and should give to the student.

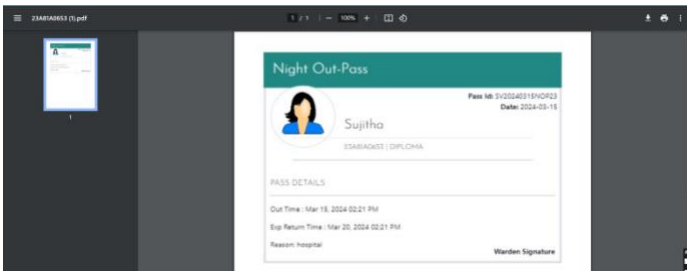


Fig 4.10: Out-pass

This the format of the out pass should be generated and should show it at the gate as a permission which is approved by the hostel warden

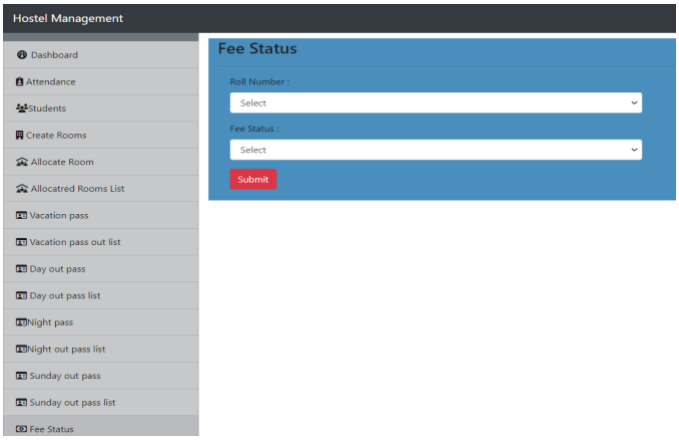


Fig 4.11: Fee Status

This is fee status module here admin can update the status whether he/she had paid their hostel fee or not. This status will be shown at their the particular student record at students module.

Student performance prediction using ID3 Decision Tree Algorithm based on students academic percentage:

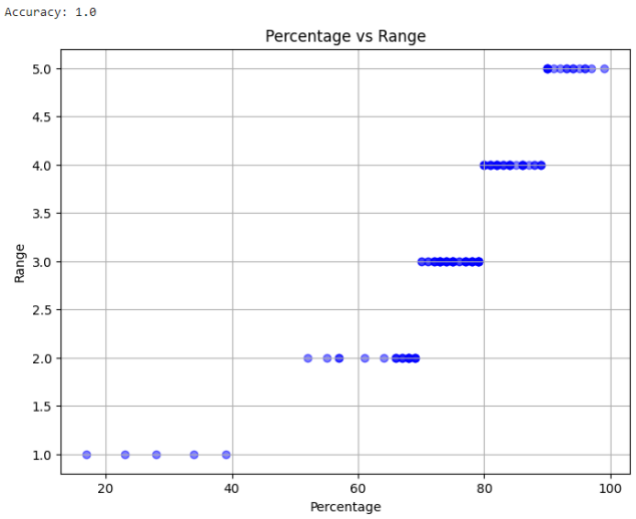


Fig 4.12: Scatter Plot

Here in the above image states that each dot is refers to student and range is represented in numeric values on y-axis and percentage is represented on x-axis. It depicts that the no of students at a particular range with their academic percentage.

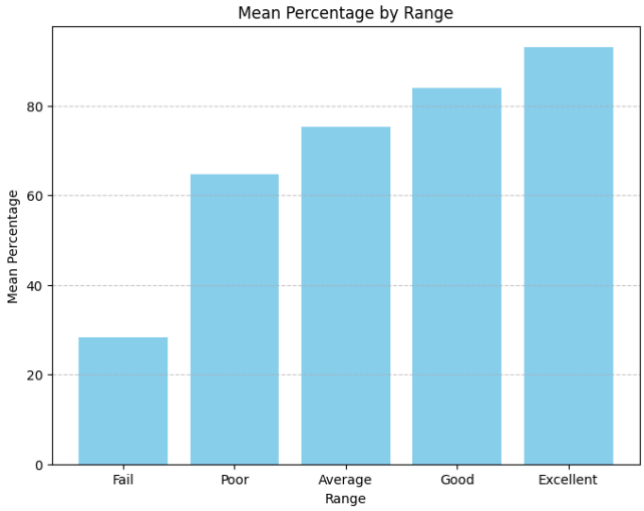


Fig 4.13: Bar Graph

In this graph it clearly shows the no of students by referring to the bars on the graph. Here percentage is represented on y-axis and range is represented on x-axis.

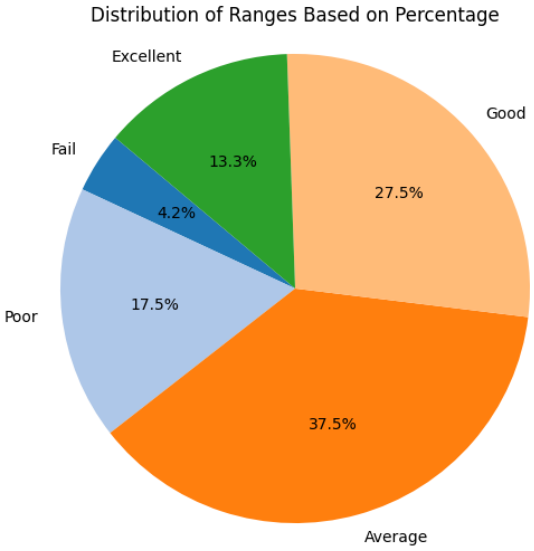


Fig 4.14: Pie Chart

Here the above pie chart states the total percentage of students at each range such as 13.3% of students at excellent and 17.5% of students at poor and etc… All the percentage values represented in float values.

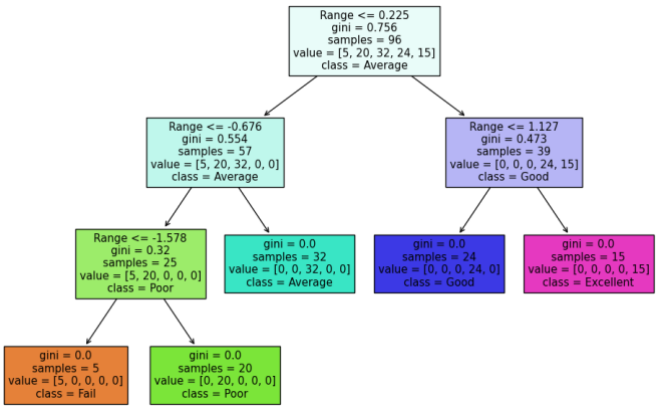


Fig 4.15: Decision Tree representation of students performance prediction

V.FUTURE SCOPE

- Implementing biometric authentication for secure attendance process.
- To provide multi factor authentication.
- Adding student module for better communication with warden.
- Communicating with parents through SMS regarding the student presence in hostel.
- Implementing output of the student marks prediction on admins dashboard.
- Predicting the students performance using clustering methodologies.

VI. CONCLUSION

In this document, the decision tree technique helps to anticipate the student's performance hinge on the student's database. Some quirks were collected deriving from the student's database to forecast the ultimate grade of an apprentice. This gathering of student's information further helps the pupil to enhance the apprentice performance. Giving much attention to the students who got low grades helps them achieve good grades in further. In compendium, enacting the ID3 algorithm for the anatomy of students' performance brings forth esteemed acumens into the factors altering academic sequels. The algorithm's aptness to build illustratable decision trees aids in cognizance of the multiplex relationships amidst divergent variables. By abusing the tree edifice, pedagogues can spot key aspects impacting student triumph and probably anticipate future recitals.

Nevertheless, it is requisite to discern that the efficacy of the ID3 algorithm relies on the quirk of the input data, and behavioral musings should be taken into rendition when pertains machine learning approaches in educational appeals. The prospection of the ID3 algorithm in the gauging of student staging offers a businesslike approach to denuding patterns enclosed by pedagogic data. Through the construction of decision trees, this algorithm legalizes pedagogues to helm and penetrate the convoluted web of factors regulating academic sequels. The pellucidity of the tree edifice empowers for a clear envisaging of key incentives, assisting in the discerning of scathing aspects that bestow student triumph or defiance's. Aversion its merits, it is decisive to hail the enactment of the ID3 algorithm with a meticulous stance. The algorithm's potency depends on the vacantness and caliber of data, and its intelligibility may be imperiled in the occupancy of corrupt or fragmentary information. Moreover, principled mulling, such as the inherent algorithmic bias, should be taken into recital to ensure trustworthy and unbigoted upshots for all students.

VII. REFERENCES

[1] An Intelligent Student Hostel Allocation System Based On Web Applications. Ambrose Azeeta, sanjay Misra. Modupe Odusami, onyepunuka ugochukwu peter, and Ravin Ahuja.

[2] Hostel Management System (HMS) is software developed for managing various activities in hostel. Deepali Narkhede, Rutuja Bamgude, Mayuri Sonawane.Mandar Shevade.

[3] Smart Dashboard For Managing The Hostel Activities. Abhishek Pundir. Akarsh Singh, Tanvisha Varshney, Tanvi Singh, and Ayushi Gupta.

[4] Implementation of Hostel Management With Automation Using Design Thinking. Dinesh.B.Gogul Nithin.R. pavatharani.R, Sneha.R, and C.Senthil Kumar.

[5] Machine Learning Algorithm for Student's Performance Prediction. H.M. Rafi Hasan, Mohammad Touhidul Islam , AKM Shahariar Azad Rabby, Syed Akhter Hossain.

[6] STUDENT'S PERFORMANCE ANALYSIS USING DECISION TREE ALGORITHMS. Abdulsalam Sulaiman Olaniyi, Saheed Yakub Kayode, Hambali Moshood Abiola, Salau-Ibrahim Taofeekat Tosin, Akinbowale Nathaniel Babatunde.

[7] PREDICTING STUDENTS' PERFORMANCE USING ID3 AND C4.5 CLASSIFICATION ALGORITHMS. Kalpesh Adhatrao, Aditya Gaykar, Amiraj Dhawan, Rohit Jha and Vipul Honrao.

[8] STUDENT PERFORMANCE PREDICTION BASED ON DATA MINING CLASSIFICATION TECHNIQUES.
Y. K. Saheed, T. O. Oladele, A. O. Akanni, and W. M. Ibrahim.

[9] Classification of Student Achievement Using ID3 Algorithm. MingHua Jiang, XiaoSuo Luo.

[10] EFFICIENCY OF DECISION TREES IN PREDICTING STUDENT'S ACADEMIC PERFORMANCE.
S. Anupama Kumar and Dr. Vijayalakshmi M.N.

[11] An Analysis on Performance of Decision Tree Algorithms using Student's Qualitative Data.
T.Miranda Lakshmi, A.Martin, R.Mumtaj Begum, R.Mumtaj Begum.

[12] ID3 Derived Fuzzy Rules for Predicting the Students Acedemic Performance.
Anita Chaware, Dr. U.A. Lanjewar.