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Abstract - The main purpose of the project is to generate the automated time-table. As we come across the problem of generating time-table in almost every school and university. The goal of this research paper is to generate a model using genetic algorithm, which can efficiently solve this problem. Students and faculty can view the time-table once it is finalized. The Admin can edit and update the time-table according to the need. The Objective is to reduce the complication of generating a time-table. As the Admin can perform following information like assigning number of classroom, faculty information, list of subjects, break time.

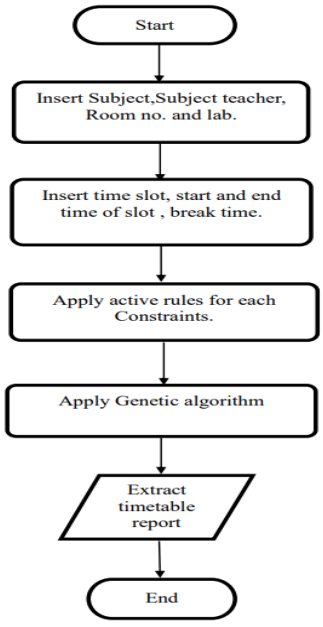
Keywords— Genetic Algorithm, Admin roles, Automated time-table.

I. INTRODUCTION

Timetable generation is a complex and challenging task, especially in large educational institutions. It requires the consideration of many factors, such as the availability of rooms, lecturers, and students, as well as a variety of constraints, such as the need for breaks between classes and the avoidance of conflicting time slots. Traditionally, timetable generation has been done manually, which is time-consuming and error-prone process. However, recently there is a growing interest in the use of automated timetable generators. These systems use a variety of algorithms to generate timetables that meet all of the required constraints.

One of the most promising approaches to automated timetable generation is the use of genetic algorithms . GAs are a type of evolutionary algorithm that can be used to solve optimization problems. They work by simulating the process of natural selection, which fitter's individuals are more likely to be selected to reproduce. In the context of timetable generation, a GA can be used to generate a population of timetables. Each timetable in the population is represented as a chromosome, which is a string of genes. The genes in the chromosome represent the different courses, rooms, and lecturers that are assigned to each time slot. The GA then uses a variety of operators, such as selection, crossover, and mutation, to evolve the population of timetables. The fitter timetables are more likely to be selected to reproduce, and the genes in the chromosomes are recombined to create new timetables. This process is repeated until a timetable that meets all of the required constraints is found. GAs have been shown to be effective in generating timetables that are both feasible and efficient.

They are able to consider a large number of factors and constraints, and they can generate timetables that are more likely to be acceptable to students and staff. In addition to GAs, there are a number of other approaches to automated timetable generation. These include constraint programming, mathematical programming, and heuristic search. The choice of approach depends on the specific characteristics of the timetable generation problem. Automated timetable generators have the potential to save time and effort, and to reduce the number of errors in timetables. They are a valuable tool for educational institutions that are looking to improve their timetable generation process.



II. PROBLEM STATEMENT

To generate a timetable that meets all of the required constraints. The constraints can be anything from the availability of rooms and lecturers to the need for breaks between classes. The Manual timetable generation is a time consuming and error-prone process. An automated timetable generator is a software system that can generate timetables that meet all of the required constraints. To generate timetables that are adaptable to changes in the student body or the curriculum.

III. EXISTING MODEL & PROPOSED MODEL

EXISTING MODEL

In the previous system many of the task were carried out manually as it becomes a tedious job. Designing time-table with a pen and paper which was very time consuming.
Due to overlapping of classes and faculties organization cannot achieve the desired output.

DRAWBACKS OF EXISTING MODEL

- Overlapping of Classes
- Cannot provide optimal solution
- Time Consuming
- It becomes challenging to make changes on a short notice

PROPOSED MODEL

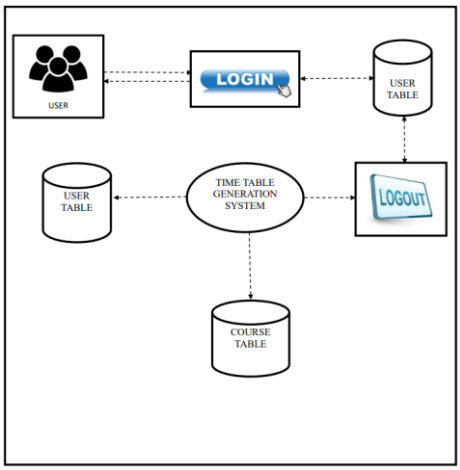
The proposed model will solve the difficulties related to timetable generation. As the model will be capable of generating the complete timetable on the basis of some inputs like classes, faculty, time etc.

ADVANTAGES OF PROPOSED MODEL

- It is flexible as compared to manual generation
- Saves time and effort
- Reduces error
- More accurate

To generate the optimized timetable we need to consider the required constraints. Satisfying most of the constraints can lead us to optimized solution. Constraints to consider are :

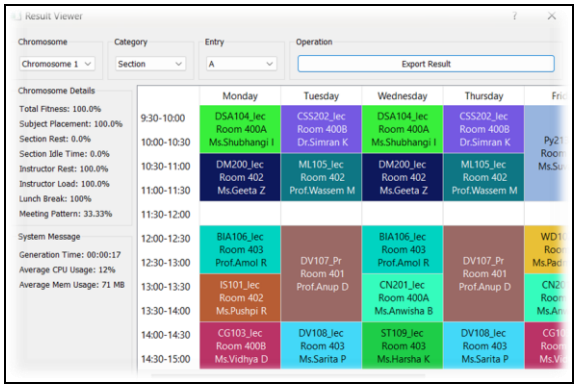
- Admin : Admin can update, assign the required input, break time, number of classes and labs available, faculty information.
- Faculty : Can view the timetable, Add students information .
- Student : Can see the timetable of the specific day.

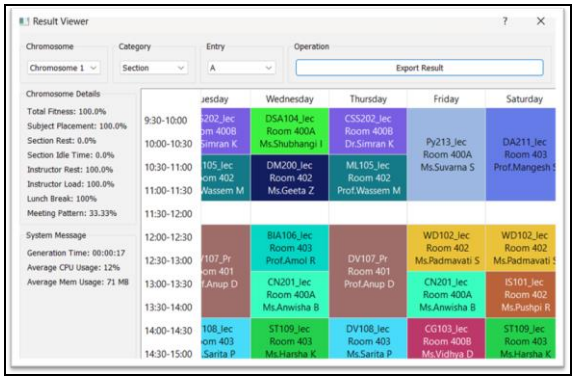


IV. METHODOLOGY

"In this paper, we propose a methodology for generating automated timetables using a genetic algorithm (GA). Timetable scheduling is a classic and highly constrained optimization problem with diverse real-world applications. Our approach leverages the power of GAs, a nature-inspired optimization technique, to efficiently and effectively produce schedules that satisfy multiple constraints and preferences. The GA-based timetable generation process begins with an initial population of possible schedules, represented as chromosomes. These chromosomes are subjected to genetic operations such as crossover and mutation, which mimic the principles of natural selection and genetic recombination. Fitness functions are defined to evaluate the quality of each schedule in terms of factors like resource utilization, conflict resolution, and user preferences. Through generations of evolution, the GA refines the population, gradually converging towards optimal or near-optimal timetable solutions. To demonstrate the effectiveness of our methodology, we applied it to the scheduling of classes in a university, taking into account constraints like room availability, faculty preferences, and student course preferences. Experimental results show that our GA-based approach outperforms traditional scheduling methods, offering more flexibility, adaptability, and robustness in producing timetables that meet the diverse needs of stakeholders. This research contributes to the field of automated timetabling by offering a practical and efficient approach that can be adapted to various scheduling scenarios, thus improving resource utilization and user satisfaction."

V. RESULTS





VI. CONCLUSION

This paper resolves the complex issue of generating timetable. It overcomes various problems like assigning classes, faculty, labs, without clashing of subjects at same time. This can now be used to solve this complex problem in universities and schools. As the genetic algorithm is the most efficient to obtain a optimized timetable. This provides all the required details in the database.

REFERENCES

[1] Shraddha Thakare, Tejal Nikam, Prof. Mamta Patil,"Automated Timetable Generation using Genetic Algorithm" Department of Computer Engineering, New Horizon Institute of Technology and Management Thane, India Conference, 2020.

[2] Prof Archana Salaskar, Rupesh Malla, Anurag Singh, Parmatma Sahani, Mohammad Khorajiya , "TIMETABLE GENERATOR USING GENETIC ALGORITHM", Information Technology, Vasantdada Patil Prathishtan College of Engineering, Mumbai, India,2023.

[3] Kehinde Wiilams, Micheal Ajinaja, "Automatic Timetable Generation Using Genetic Algorithm" Federal Polytechnic Nigeria 2019.

[4] Mrunmayee V. Rane, Vikram M. Apte, Vishakha N. Nerkar, K.Y. Rajput, Mani Roja Edinburgh," Automated Timetabling System for University Course" International Conference on Emerging Smart Computing and Informatics 2021.