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Load Distribution and Time Table Generation Software

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Abstract: ***In institutions with a lot of students, the manual timetable preparation method takes a long time and frequently results in different classes conflicting in the same room or with the same teachers teaching multiple sessions at once. This are just the result of frequent human error, which is exceedingly challenging to avoid in procedures like this. People typically adapt the previous year's schedule to get around these issues, but it is still labour-intensive to implement such changes.***
Our suggestion is to create an automated system in order to solve all of these issues. The system will receive multiple inputs, such as student, subject, class room, and teacher details; based on these inputs, it will produce a potential time.
Keywords: Timetable, Automatic, Academic, Load distribution.

I. INTRODUCTION

Humans have needed timetable scheduling ever since they learned how to efficiently manage their time. It is extensively utilized in universities, colleges, and other educational and professional settings, including training programs, couching centres, and crash courses. Timetable scheduling used to be done manually by one person or by a group of people who took a lot of time and effort to schedule the timetable by hand. Even the smallest limitations can be difficult to schedule, and the situation gets worse when there are more constraints or data to process.

In these scenarios, a well-designed timetable is used for an entire generation without any modifications, which proves to be boring. Other situations that may give rise to issues include low employer and worker numbers, which may force a rescheduling of the schedule or the immediate requirement to fill open seats. Organizations such as schools, colleges, universities, and institutions frequently adopt these schedules. They must plan their course to accommodate the present length of time and the facilities at their disposal. They should, however, adjust their schedule to accommodate freshly enrolled students in new batches and new course additions. This might mean changing the entire timetable for all of the batches and scheduling it to begin as soon as feasible before the batches' courses begin.

An additional issue that arises while establishing exam schedules. Exam schedules for batches taking tests on the same day must be carefully planned, accounting for any issues pertaining to the facilities needed to administer the exams concurrently.

II. LITERATURE REVIEW

Trying to develop a software which helps to generate Timetable for an Institution automatically. By looking at the existing system we can understand that timetable generation is done manually. Manually adjust the timetable when any of the faculty is absent, and this is the big challenge for Automatic Timetable Generator that managing the timetable automatically when any of the faculty is absent.

It will not be difficult to manage and maintain these since, as we all know, each institution or organization has its own schedule. This scheduling will become more complicated as workload is taken into account. As previously stated, the maximum and minimum workload that is typical for a college should be taken into account while creating a schedule. In those situations, creating a schedule will become more difficult. It takes a lot of time to complete as well.

Mei Rui [1] In this paper, through the analysis and the summarization of the existing problems, a mathematical model for the course timetable system is proposed. At the same time, through the use of the pattern recognition technology in artificial intelligence, aiming at this mathematical model a new university course timetable system design program is proposed and realized. This program not only can well solve the shortages of the existing course timetable system, but also is simple and easy to operate, has strong versatility.

Bhaduri A [2] evolutionary techniques have been used to solve the time table scheduling problem. Methodologies like Genetic Algorithms (GAs), Evolutionary Algorithms (EAs) etc, have been used with mixed success. In this paper, we have reviewed the problem of educational time table scheduling and solving it with genetic algorithm.

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We have further solved the problem with a mimetic hybrid algorithm, genetic artificial immune network (GAIN) and compare the result with that obtained from GA. Results show that GAIN is able to reach the optimal feasible solution faster than that of GA.

Dipti Shrinivasan [3] Finding a feasible lecture/tutorial timetable in a large university department is a challenging problem faced continually in educational establishments. This paper presents an evolutionary algorithm (EA) based approach to solving a heavily constrained university timetabling problem. The approach uses a problem-specific chromosome representation. Heuristics and context-based reasoning have been used for obtaining feasible timetables in a reasonable computing time. An intelligent adaptive mutation scheme has been employed for speeding up the convergence. The comprehensive course timetabling system presented in this paper has been validated, tested and discussed using real world data from a large university.

Dipti Srinivasan, Tian Hou Seow, Jian Xin Xu [4] "Dipti Srinivasan, Tian Hou Seow and Jian Xin Xu" proposed that finding a feasible lecture/tutorial timetable in a large university department is a challenging problem faced continually in educational establishments. This paper presents an evolutionary algorithm (EA) based approach to solve a heavily constrained university timetabling problem. The approach uses a problem specific chromosome representation. Heuristics and context-based reasoning have been used for obtaining feasible timetables in a reasonable computing time. An intelligent adaptive mutation scheme has been employed for speeding up the convergence. But this system is difficult to implement since it considers entire university problem and evolutionary algorithm.

W. F. Mahmudy and R. E. Febrita (2017) [5], Use fuzzy logic to create and carry out timetable scheduling that incorporates multiple genetic operators. The constraints are resolved using fuzzy logic, a multivalent logic. This is derived from fuzzy set theory and is used to replace exact reasoning with approximative reasoning. The proportion of truth of a statement may vary between 0 and 1, depending on the membership values of formal fuzzy logic variables, which may not always be 0 or 1. Fuzzy logic is not limited to two value reasoning, in contrast to classical logic. Results show that this method can be used to maximize difficult scheduling objectives and produce outcomes that are realistic.

III. METHODOLOGY

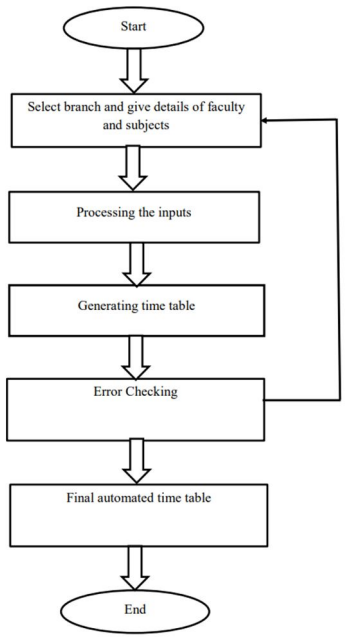


Fig.1 Flowchart Diagram

The general operation of the Load Distribution and Time Table Generation Software System is explained in the flow chart above. It comprises input information on the teacher, subject data, and both soft and hard constraints. An ideal timetable will be produced by the system utilizing this information collection. The system has a login page first. To access the Home Page, which offers details on the Load Distribution and Time Table Generation Software System, the user must first check in with a valid user ID and password. Additionally, there are different link tabs on the menu bar that allow you to travel to different pages, but they are only functional when the user is logged into the system.

After logging in, the user will be granted permission to access the following page, which is for adding subjects. On this page, the user will be requested to provide the subject name, timings, and other pertinent information. The user's entry of subject-related data will be mirrored and stored in the database. The user must enter the faculty information, such as the faculty name, which faculty will be taking which subject, whether it will be a theory session or a practical, etc., on the next page after the system has obtained the subject detail. Additionally, these particulars will be added to our dataset. The system currently contains all subject, teacher, and other associated data.

Following the user's click of the "generate" button on the system, all of the data inputs will be saved and gathered into our dataset. The Load Distribution and Time Table Generation System will then utilize all of the constraints and information to create an optimized timetable in an Excel sheet, which the user can download to their device.

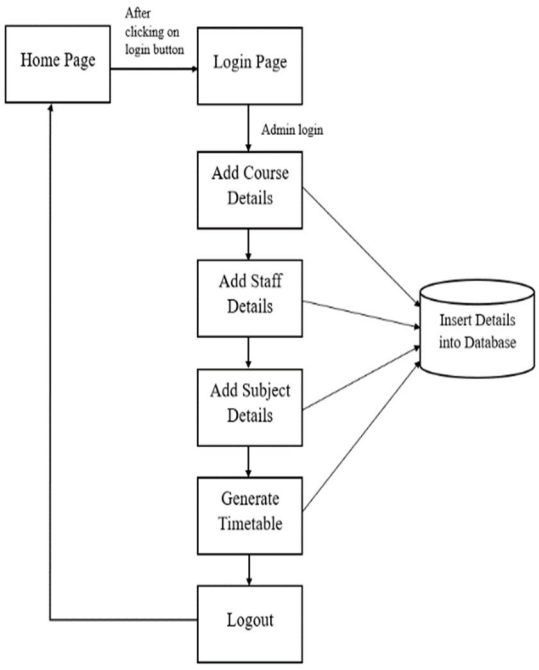
IV. PROPOSE SYSTEM

The "Load Distribution and Time Table Generation Software" system under consideration is intended to outperform the current manual system in terms of efficiency. It initiates all base tasks that are currently completed by hand. The finished system should be able to create timetables entirely automatically, saving institute administrators a great deal of time and work. User-friendliness of the technology to enable automatic creation of timetables. It emphasizes on making the most use of available resources, such as instructors, labs, and elective courses. This method makes it possible for anybody to view the timetable and creates a number of helpful perspectives from it.

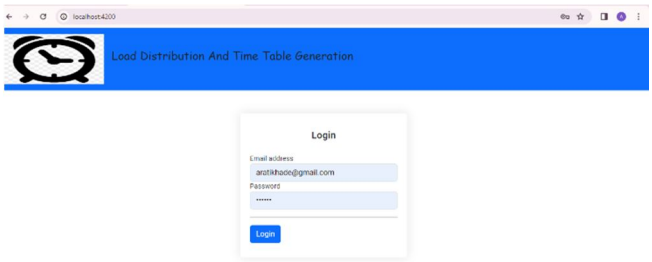
1) The majority of colleges provide several distinct courses, with each course consisting of "n" subjects.
2) There are now few faculties, and each faculty member may teach multiple disciplines.
3) The timetable now needed to arrange for all of the faculty members to work within the allotted times in a way that prevents scheduling conflicts.
4) For this, a specially designed algorithm is employed.

Advantage of Proposed System:

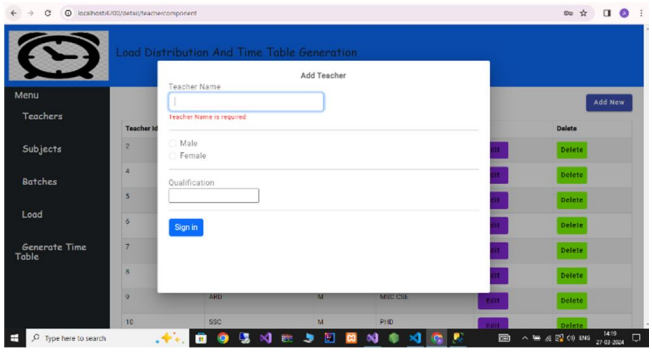
- Easier slot assigning.
- Less time consumption.
- NO slot clashes.
- Various possible slot combinations can be acquired.
- User friendly.



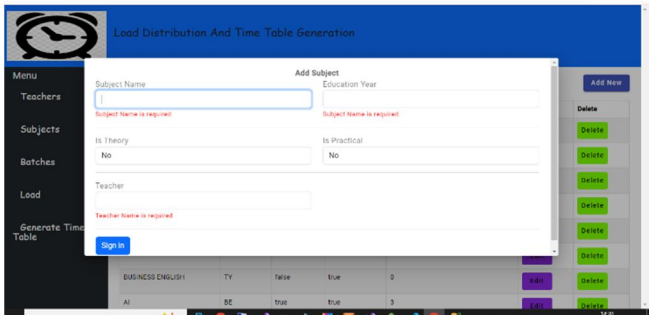
V. RESULT



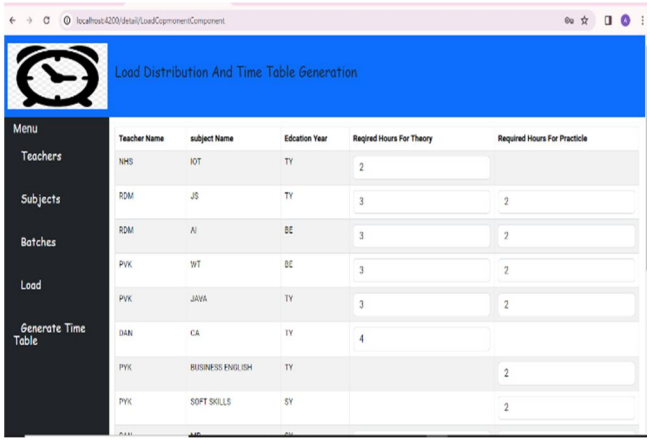
1) *Login Page:* Admin can login the page with their Id & Password. If the password is wrong the system will show the invalid password.



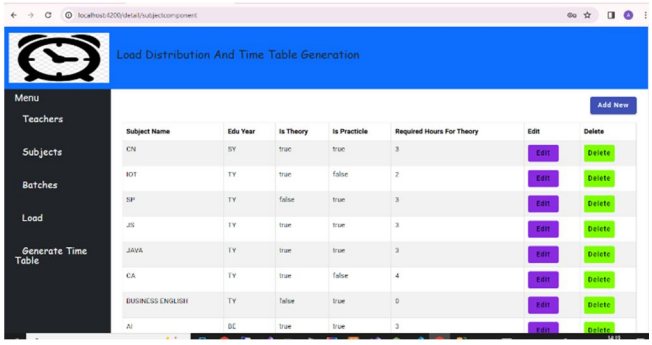
2) *Faculty Details:* Teachers add their name, gender, qualifications and other details.



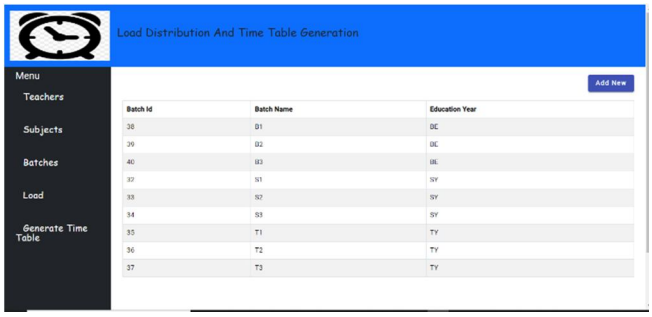
3) *Subject Details:* Teacher add their teaching subjects, their practical batches and class.



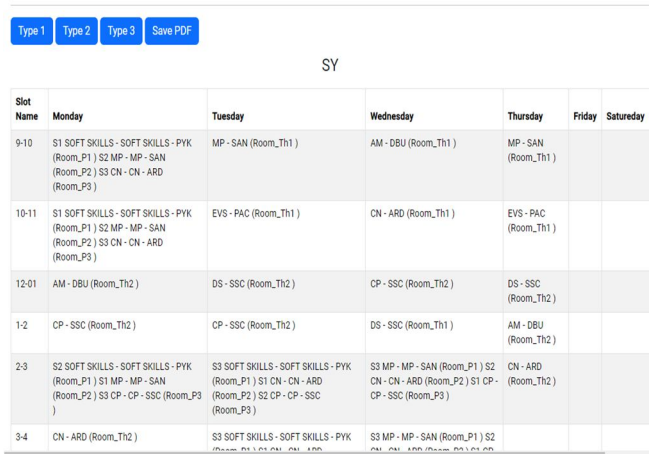
4) System will distribute the load of teachers according to their lectures and practical batches.

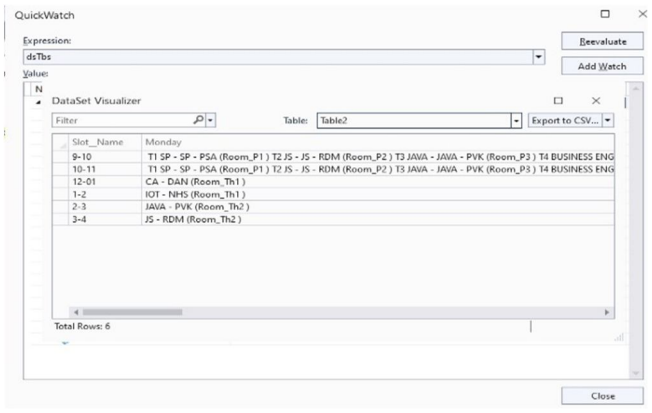


5) Here admin can add, delete or edit the subjects, lectures or practical batches.



6) Add practical batches.







7) After adding the details system will generate the timetable according to the class or education year.

VI. COMPARISON

Aspect	Bhaduri et al. (GAIN)	Dipti Shrinivasan (EA)	Load Distribution and Time Table Generation System
Problem Domain	Educational time table scheduling	University timetabling	Educational time table scheduling
Methodology	Genetic algorithm with GAIN	Evolutionary algorithm (EA)	Load Distribution and Time Table Generation System
Main Features	Utilizes genetic artificial immune network (GAIN), hybrid algorithm	Uses problem-specific chromosome representation, heuristics, context-based reasoning	Utilizes input information on teachers, subjects, soft and hard constraints
Performance Comparison	GAIN reaches optimal feasible solution faster than GA	Adaptive mutation scheme for speeding up convergence	Generates Feasible timetables
Output	Optimized timetable in Excel sheet	Feasible timetables	Feasible timetables

VII. CONCLUSION

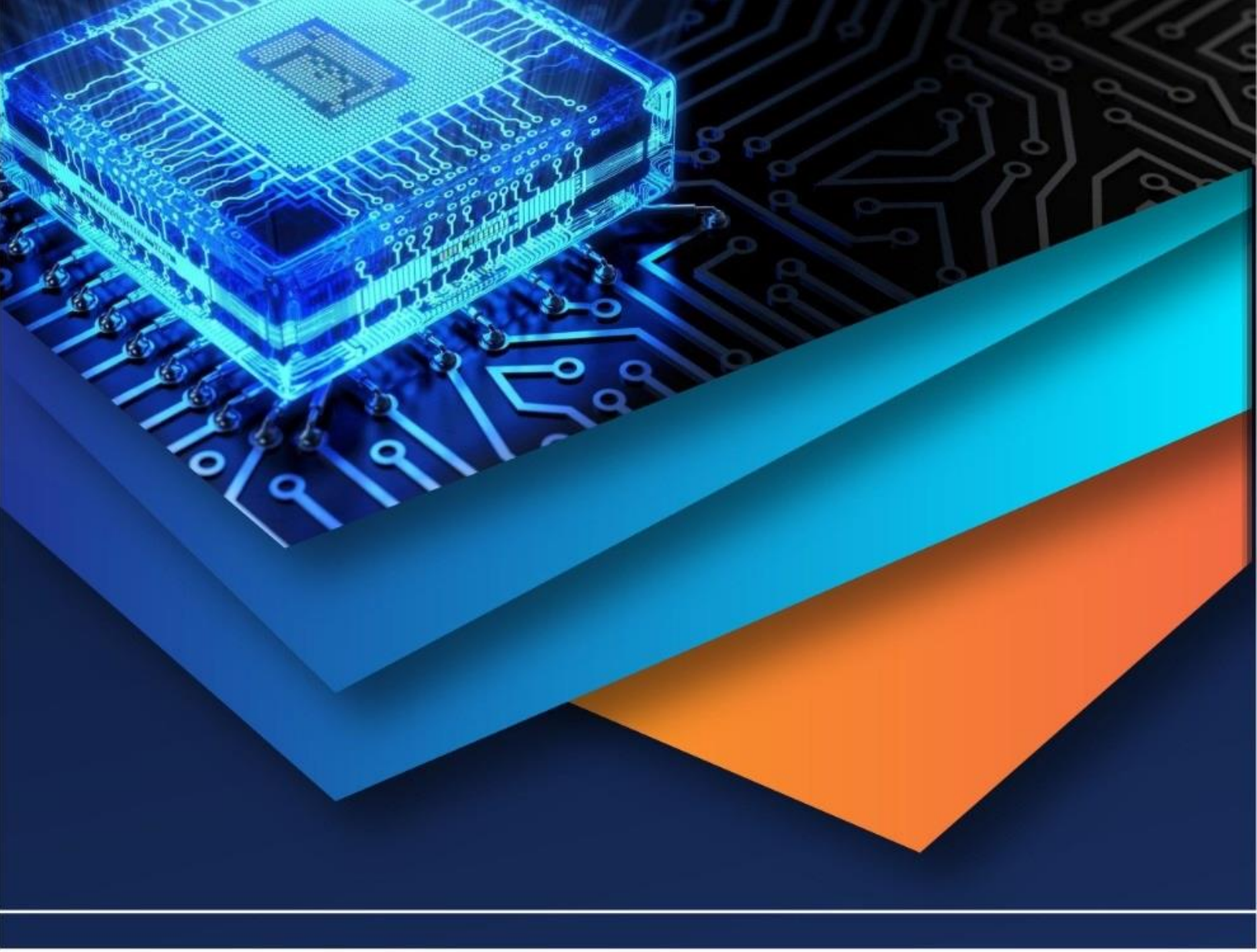
The system that the Load Distribution and Time Table Generation Software uses is web-based. Its primary purpose is to create a timetable based on the data entered. This application will make the process of creating time tables easier and more straightforward.

If time tables were created manually, they might have to be manually entered into a spreadsheet, which could result in limitations or other issues that are hard to figure out. The project is designed so that there are no scheduling conflicts and features that allow the schedule to be customized as needed. This technology automatically generates a separate timetable for each class. It is possible to obtain different slot combinations, enabling the creation of a new schedule when necessary.

The project cuts down on time spent and the discomfort associated with manually creating the schedule. The initiative may lead to future improvements in time constraint issues, leave management. This improvement can be attained by making additional adjustments while maintaining the methodology and methods employed for this project.

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