Survey Paper on Automated Timetable Generator Andriod Application

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Abstract- Generating timetable for university with many branches, different years, and multiple batches is a tiresome job. It takes a lot of time and is required for every semester that is of six months. Thus, a lot of time and manpower is taken up by this process. In some cases, the manual process of creating timetables is too cumbersome. Creating temporary timetables when a faculty is on leave is impractical. In this paper, we have created an algorithm to generate timetables which can save a lot of time and pressure on the person doing this job manually. A software-based approach is better, as a computer can process data and churn out results at a much higher rate with greater accuracy. Also, it can be coded and optimized as per requirements set by different universities and the base code will remain the same.
Currently, in most of the institutes, this time-consuming most complex problem is tackled manually by a single person or a group of related people with the only goal of producing feasible timetables. This may lead to unnecessary wastage of faculties and concerned members precious time due to lack of optimization in the generation of timetable. One cannot deny the human errors which will introduce conflicts such as overlapping of resources, double booking of time-slots, etc. To generate conflict-free and optimized timetable, adequate constraints need to be considered. These constraints are often classified as either hard or soft in nature. Fulfilling just hard constraints will create a feasible solution but satisfying maximum soft constraint would give an optimized solution.

Keywords- Schedule, Timetable, generator, Automated, Andriod application

INTRODUCTION

An automated timetable generator Android application is a super handy tool that helps you manage your time and tasks effectively. It's like having your own personal assistant to create a schedule for you!
"Timetabling is one of the common scheduling problems, which can be described as the allocation of resources for tasks under predened constraints so that it maximizes the possibility of allocation or minimizes the violation of constraints" [1]. Due to the non-proportionality between a rapid increase in the number of students enrolled, university courses and accessible resources, the complexity of the problem has become multifold. "This problem is described as a Non-Polynomial-hard combinatorial optimization problem having no specific solution".

LITERATURE SURVEY

1. Paper name: Automated Timetabling System for University Course

Author Name: Mrunmayee V. Rane, Vikram M. Aptei, Vishakha N. Nerkar, Mani Roja Edinburgh, K.Y. Rajput

Summerise paragraph:
The problem of class teacher timetabling was first studied by Gotlieb in 1962. Since then several algorithms have been introduced to solve the problem. The earliest solution proposed was based on sequential methods that deal with timetabling problems as a graph problem. [4] Later, several researchers applied the Evolutionary Algorithm (EA) and Genetic Algorithm (GA) approach to find a feasible and optimized solution for highly constrained systems [5]. Metaheuristic methods [6], tabu search, cluster methods, simulated annealing, scatter search methods, fuzzy logic [7] are some other approaches [8] used by the intelligent methods [9] such as Swarm intelligence, [10] Artificial Neural Networks and hybrid approach. However, all of these methods took help of foundational algorithms which are highly sensitive, even a small change results in different group level behaviour. Also, the user interface was not involved, which made deployment harder.
Mohamed Abdelfattah and Ahmed Shawish published a paper on 'Automated Academic Schedule Builder for University' which "the genetic algorithm to produce an optimal timetable for each faculty within a university. The proposed application produced a nearly optimal

timetable". The fitness function designed here is generic in nature to fit in any environment, hence require some manual modification in the end to satisfy all the requirements. The more complex environment will take more time to produce results using genetic algorithm approach." [11] Another research paper on 'automated college timetable generator' was published by Adithya R Pai, Ashwitha S, Raksha Shetty, Prof. Geethalaxmi in 2018. "In this paper, researchers have first approached the problem with Genetic Algorithm and further compared it with a Genetic Artificial Immune Network (GAIN). Results showed that GAIN is able to reach the optimal feasible solution faster than that of GA". [12] Use of genetic algorithms and GAIN makes it computationally expensive. In IIT Kanpur, Dilip Datta, Kalyanmoy Deb and Carlos M. Fonseca came up with the solution for a very complex system of their institute. In this work, "The potentiality of Evolutionary Algorithms (EAs) has been exploited to schedule the even-semester classes of the institute. Using a multiobjective EA-based university class timetable optimizer, a number of trade-off solutions, in terms of multiple objectives, were obtained very easily". [13] However, this approach is restricted to their institution.

2. Paper Name: Development of an Efficient Timetable Systemusing AngularJS and Bootstrap 3
Author Name: Sundresan A/L Perumal, Mujahid Tabassum, Norita MD Norwawi

Summerise Paragraph:
A computerize and automated timetable system, definitely can enhance productivity, quality of services and users working efficiency along saving a lot of paper work time within universities. Several methods such as sequential methods, cluster methods, constraint-based methods, and meta-heuristic methods [16] have been proposed for the optimization of timetable problem.
In the following research paper [17], the authors haveproposed a mathematical model for timetable system. They have used the artificial intelligence concept such as patternrecognition technology to solve the related problem. Theconcept solves the existing problem and offer strong versatility. In another research paper [18], they have used Evolutionary Algorithm (EA) related to GA to solve the related problems.They have used several algorithms such as a mimetic hybrid algorithm, genetic artificial immune network (GAIN) and compared the results with GA. This research paper results show that GAIN produces better result as compared to GA in term ofspeed and optimal solution.
However, in our proposed solution, we have used an efficientsolution with the help of Bootstrap, PHP, MySQL and AngularJS frameworks. This framework will optimize system performance and solve related problems such as classes, students and lecturers overlapping. The framework also helps user to save their time and eliminate the manual timetable complexity process. This developed product covers a wide range of spectrums and scopes along, offering efficiency and flexibility for both end users and management people

3. Paper name: Design and Implementation of An Automatic Examination Timetable Generation and Invigilation Scheduling System Using Genetic Algorithm
Author Name: Abdulaziz Aminu, Wahyu Caesarendra, Umar S Haruna, Abubakar Sani

Summerise paragraph:
No literature survey

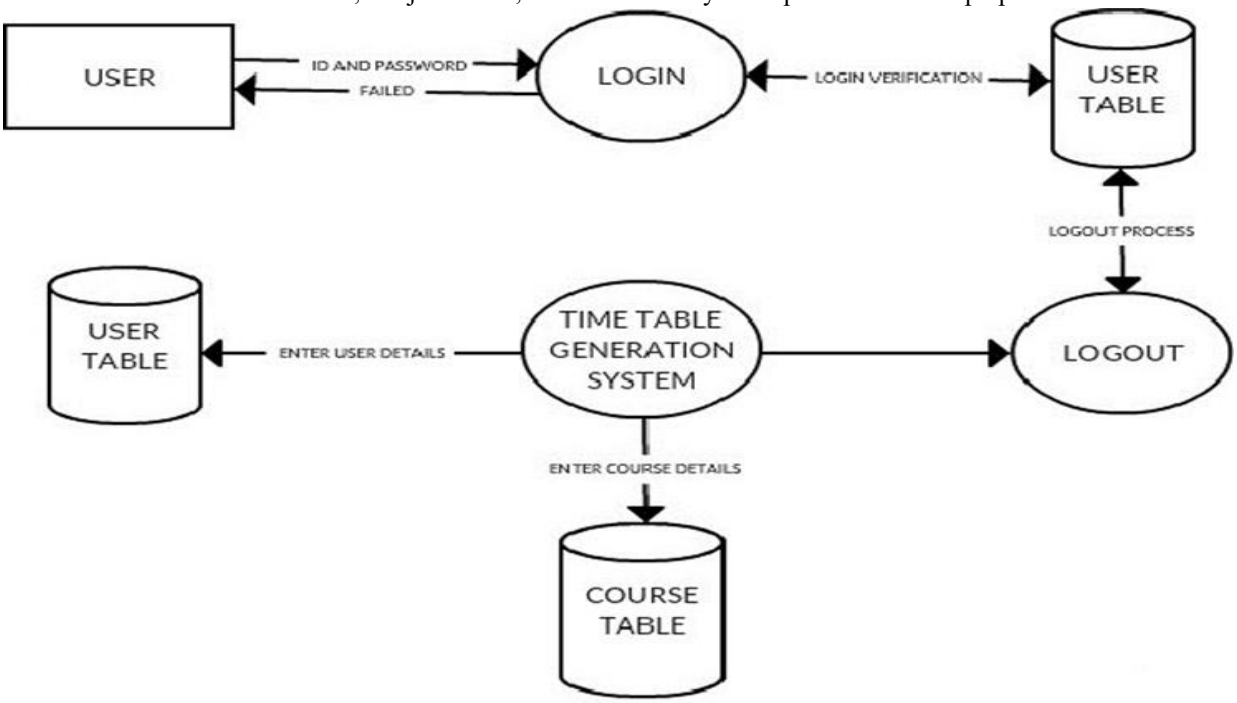
4. Paper name: Auto-Generate Scheduling System Based on Expert System
Author name: Nur Iqtiyani Ilham, E. H. Mat Saat, N. H. Abdul Rahman, Farah Yasmin Abdul Rahman, Nurhani Kasuan

Summerise paragraph:
No literature survey

5.Paper name: Genetic Algorithm for Solving University Course Timetabling Problem Using Dynamic Chromosomes.
Author name: Ghazi Alowaini, Amjad Abdullah Aljomai.
Summerise paragraph:
No literature survey

PROPOSED SYSTEM
Automated time table generator is an application for creating time table of different courses. It is very useful for application time table co-ordinate. This application can save a lot of time. In the time it takes to make a time table for a branch, the time table of many branches will be created through this application. In this we have placed the login page. After logging in, fill the information of your department (like BE, BTech etc) and select the branch (like computer, electrical etc). After that select the

semesters and fill the information which subjects are in those semesters. Then should enter the teachers information and select semester, subjects in it, how many hours are there in a week and how many labrotary are selected and submit. Then the time table of your department will be prepared.



ALGORITHM

- Genetic Algorithm:

Genetic algorithm are inspired by natural selection and genetics. They can efficiently explore a large search space and are well-suited for optimization problems. Genetic algorithms, can be applied to timetable genereation by representing potential timetables as indiviuals in a population and evolving them over generations.

- Heuristic search Algorithms:

Various heuristic search algorithms, such as hill climbing and greedy algorithms, can be adapted for timetable generation. While they might not always find optimal solutions, they can work well for large and complex problem instances.

CONCLUSION

To introduce and make this project in operation in colleges which are using manual methodology for making timetable and make changes in automation in the many other services given to the teacher. By using this project one can save time as well as hard work done in making it manually. It helps users create timetable easily and efficiently. It saves a lot of time and effort by automatically generating Schedules based on input criteria like classes, subjects, and available time slots. It's a great tool for faculty to manage their time effectively.

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