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Auto Timetable Generating System

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***Abstract* — This paper discusses the various approaches that can be taken to solve the timetable generation problem. Timetable generation is basically a constraint satisfaction problem. The methods discussed in this paper are capable of handling both soft and hard constraints. Once the final timetable has been generated, teachers and students can access it through three different views i.e., class view, lab view and combined view of classes and labs.The Timetable Generation System aims at automating the process of timetable generation for the Information Technology department of Dhole Patil College of Engineering, Pune. It takes the number of semesters, sections, subjects, labs and teachers as input and generates a timetable which satisfies all of the hard constraints.**

Keywords: *React Native Framework, Mobile App, Firebase Platform, Create automatically.*

I INTRODUCTION

Even though most college administration work has been computerized, timetable scheduling is still done manually due to the difficulties involved. The manual timetable scheduling requires considerable time and effort. Timetabling is the allocation, of given resources to objects that are placed in space time, in such a way that they satisfy a desirable set of objectives.The college lecture-timetabling problem asks us to find some slots and classrooms which satisfy the constraints imposed on offered courses, lecturers, classrooms and so on. The problem is a combinatorial optimization problem belonging to NP-hard class where the computational time grows exponentially as the number of variables increases.

Various approaches have been made in the past decade to solve the problem of constructing timetables for schools and colleges. In our paper this problem is formulated as a constraint satisfaction problem and we discuss the various approaches that are capable of handling both hard and soft constraints. Hard constraints cannot be violated under any circumstances. For example, two classes cannot be allocated to a single teacher at the same time period, two classes cannot be attended by a student at the same time, more than one class cannot be held at a room at the same time et cetera.Soft constraints are necessary but not absolutely critical. For example, a timetable must be made in such a way that a group of students don't have to come to college to attend only one class.

Initially, prior to the enrolment of a new semester, the timetable committee of TOSFIT have to arrange manually the specific requirement input data (i.e., lecturer details, courses, classes and time slot) into their existing scheduling system. It is essential to ensure the precision of generated timetable to evade any discrepancy and failure on the scheduling system. Though various approaches automated system is available

to solve the timetable management problem, however, most of the organizations/universities still endure to solve the problem manually. This is happened due to most of the available system are yet to provide additional features for customaries to furnish users special needs. It is essential to note that each course may have one or more lecturers and classes depending on the total number of students registered at the particular semester.

Time table generation is tedious job for educationalist with respect to time and man power. This system allows creating time table automatically. Our automatic time generator application will help to create time tables which save the time and reduce the burden to the people who are continuously working on time tables. This automatic generated timetable application reduces the complication of manually setting and managing Timetable. In implementation result we are utilize resource scheduling to decrease the difficulties of producing timetable. Our proposed method integrates a numeral of approach, intended to advance the operativeness of the explore operation. The system will take various inputs like number of lecturer details, courses, classes and time slot. By applying on these contributions, we are able to generate probable time tables for operational days of the week for faculty.

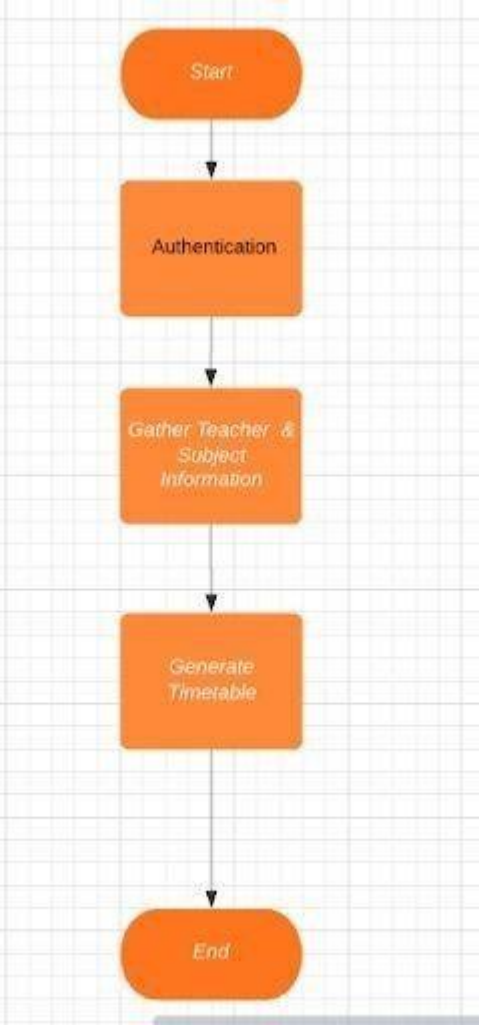

Fig. Data Flow Diagram

Although majority college organization work has been mechanized, the lecture timetable preparation is still commonly done by hand due to its inherent difficulties. The physical lecturetimetable preparation demands significant time and efforts. The manual lecture-timetable scheduling is a limitation fulfillment problem in which we find a result that satisfies the given set of constraints.

This literature survey paper segregates the section 2 for the evaluation of the past work in the configuration of a literature survey, and finally, section 3 provides the conclusion and the future work.

• II RELATED WORKS

Anirudha Nanda [1], suggests a common solution to the problem of timing. Most of the proposed previous heuristic programs of difficulty from the perspective of students. This solution, however, works from the point of view of the subject, that is, the availability of the instructor at a given time. Although all potential barriers (e.g., teacher availability, etc.) are solved firmly, the planning solution presented in this paper is flexible, with the primary purpose of resolving academic and academic conflict, teacher-related issues.

Dipti Srinevasan [2], Discover the study schedule that is possible at the university's main department is a recurring problem facing academics. This paper represents an evolutionary algorithm (EA) approach based on solving the university's robust timetable problem. Moving to problematic chromosome representation. Heuristics and contextual-based thinking using timetables may have been obtained at the right computer time. An ingenious genetic modification scheme has been used to improve cohesion. The comprehensive curriculum plan presented in this paper is approved, evaluated and discussed using real-world data from a major university. C.

Cagdas Hakan Aladag and Gulsum Hocaoglu, [3] solved course timetabling problem for Statistics Department of Hacettepe University by using a tabu search algorithm. Theirs proposed algorithm has generated successful results. The average value for these results is 1.43. For comparison, 50 solutions were generated randomly and their average value of the objection function was found to be 50.75. It was seen that the proposed tabu search algorithm produced very good timetables

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Anuja Chowdhary [4], introduces an effective timing algorithm that can effectively manage both strong and weak obstacles, which is used in an automated timeline system. So that each teacher and student can look at their timetable after they have completed a particular semester but do not plan. The Timetable Generation System generates a timeline for each class and teachers, in line with the teacher's calendar, availability and power of visual resources and other rules applicable to different classes, semesters, teachers and grade level.

David Abramson and J Abela [5] , 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. 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. In this paper, we have reviewed the problem of educational time table scheduling and solving it with genetic algorithm.Algorithms (GAs).

Ho Sheau Fen, Deris, Safaai, Mohd Hashim, Siti Zaiton, [6] produced the good timetable using a hybrid of particle swarm optimization approach that tackles hard and soft constraints in timetabling problems. They have used two different kinds of hybrid PSO for experiment purpose. The hybrid PSO-local search (LS) and hybrid PSO-constraint-based reasoning (CBR). As shown in result the hybrid PSO-CBR algorithm is capable in finding feasible and nearoptimal solution compare to hybrid PSO-LS and standard PSO algorithm. It requires more time i.e. hybrid PSO-CBR slightly longer than hybrid PSO-LS because of backtracking solutions.

Nabeel R.Al-Milli, [7] proposed the new hybrid algorithm to solve course timetabling problem based on Genetic Algorithm and Simulating Annealing algorithm.As shown in result the Great deluge is considering one of the powerful local optimization algorithms while GA is one of the best known methods of global optimization for course timetable problems.

Vibhor Bhatt, [8] Ritvik Sahajpal solved the class clash, course clash, and Teacher clash of Lecture Timetabling by using Hybrid Genetic algorithm. The soft constraints consider according to satiability (SAT) factor. The problem was solved by using string encoding, one point crossover, multiple independent crossover, consistent preserve crossover, consistent preserving mutation operators. And the result shows that by using this technique make good and convenient timetable and also decrease the computational time for this Np-hard problem..

Meysam Shahvali Kohshori and Mohammad Saniee Abadeh [9] solved the university course timetabling problem (UCTP) by using three algorithms FGARI (Fuzzy Genetic Algorithm guided by Randomized Iterative localsearch algorithm), FGASA (Fuzzy Genetic Algorithm guided by Simulated Annealing algorithm) and FGATS (Fuzzy Genetic Algorithm guided by Tabu Search algorithm). They tried to overcome the ambiguity and uncertainty, the fitness of a solution in their proposed algorithms was determined by using fuzzy logic by a set of fuzzy rules. The experimental result shows that the proposed FGATS is competitive and works reasonably well across all problem instances in comparison with other approaches.

Abdullah, Turabieh, McCollum, and Burke investigated, [10] a genetic algorithm combined with a sequential local search for the curriculum based course timetabling problem. The problem solved by the construction phase and the improvement phase. After the recombination process, a repair method is applied to transform an infeasible solution to a feasible one.

III CONCLUSION AND FUTURE SCOPE

It is a difficult task to manage many Faculty and assign subjects on time physically. Therefore, our proposed system will help overcome this inconsistency. Therefore, we can produce a timeline for any number of courses and semesters. This program will help you to create flexible pages so that in using such a program we can use a variety of tools that are more efficient and freer to use. Different timetables for each class, genres and labs are automatically generated by this system. A combination of different slots can be obtained to make another timeline as needed. The project minimizes time usage and you feel the pain in installing a timeline. The project is developed in such a way that, no slot conflicts occur that provide the

timetable features as you wish. Future improvements that can be made to the project make it a good time plan for departments and the rest of the college. This improvement can be achieved by making additional changes by keeping the method and techniques used for this project.

This software is a solution to the problem of making a timeline manually. Its main function is to save time and effort in the process of producing a time table. Intelligent data in the database can also be used to keep a record of intellectual experience in specific subjects. The accuracy of the Project Feature will provide a more flexible approach to producing this timeline. This project will produce output that fixes most without errors. Future improvements that can be made to the project make it a good time plan for departments and the rest of the college. This improvement can be achieved by making additional changes by keeping the method and techniques used in this project

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