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Web-Based Automated Timetable Scheduling

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ABSTRACT: The hand operated system of time table preparation in our colleges is very monotonous and time-consuming which results in either the same teachers ending up with more than one class at a time or a number of classes conflicting at the same classroom. Due to a non-automatic perspective, absolute utilization of resources has proven ineffective. The automatic time table scheduling provides easier ways for teachers and students to view their timetable once the Admin are finalized over the Web-application having individual login id and password. Our project introduces a practical automated timetabling approach for our college to overcome the hand operated system and conflicts occur in existing system using genetic algorithm GA. Here we also introduce a dynamic attribute for new announcement such as seminar and special classes.

KEYWORDS: Hard constraints, Soft constraints, Genetic algorithm.

I. INTRODUCTION

Our college, have a number of different courses and each course has a number of subjects. Now there are limited faculties, each faculty teaching more than one subjects. So now the time table needed to schedule the faculty at provided time slots in such a way that their timings do not overlap and the time table schedule makes best use of all faculty subject demands. We use a genetic algorithm for this purpose. In our Timetable Generation algorithm, we propose to utilize a timetable object. The object comprises of Classroom objects and the timetable for every it schedules likewise a fitness score for the timetable. Fitness score relates to the quantity of crashes the timetable has regarding alternate timetable for different classes. Classroom object comprises of week objects. Week objects comprise of Days, Days comprises of Time slots. The Time slot has an address in which a subject, student gathering going to the address and educator showing the subject is related. Also, further on discussing the imperatives. We have utilized composite configuration design, which make it well extendable to include or uproot as numerous obligations. In every obligation class the condition as determined in our inquiry is now checked between two timetable objects. On the off chance that condition is fulfilled i.e. there is a crash is available then the score is augmented by one.



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II. RELATED WORK

^[5] Here exist various timetable generation problems such as Employee Timetabling, University Timetabling, Sports Timetabling and Examination Timetabling. A large number, methods have been already proposed for solving timetabling problems. These methods come from a number of scientific disciplines like Operations Research, Artificial Intelligence, and Computational Intelligence and can be divided into four categories:

- Sequential methods
- Constraint-Based methods
- Cluster methods
- Meta Heuristic methods

^[3] Here we use the Genetic algorithms are general search and optimization algorithms inspired by processes and normally associated with natural world. Genetic algorithm mimics the process of natural selection and can be used as a technique for solving complex optimization problems which have large spaces. ^[2] They can be used as techniques for solving complex problems and for searching of large problem spaces. ^[4] Unlike, many heuristic schemes, which have only one optimal solution at any time, Genetic algorithms maintain many individual solutions in the form of population. Individuals (parents) are chosen from the population and are then mated to form a new individual (child). The child is further mutated to introduce diversity into the population. Rather than starting from a single point within the search space and GA is initialized to the population of guesses. These are usually random and will be spread throughout the search space. A typical algorithm then uses three operators, selection, crossover and mutation, to direct the population toward convergence at global optimum. GA, requires a process of initializing, breeding, mutating, choosing add killing. It can be said that most methods called Gas have at least following elements in common: Population of chromosomes, selection according to fitness, crossover to produce new offspring, and random mutation of new offspring.

III. PROPOSED SYSTEM

OBJECTIVE

- A. To reduce a time required for generating time table than existing system.
- B. To increase efficiency and accuracy of proposed system.
- C. To help teachers to maintain timetable scheduling without conflicts.
- D. To reduce paper and labor work.

SCOPE

Automatic timetable scheduling by considering hard and soft constraints.

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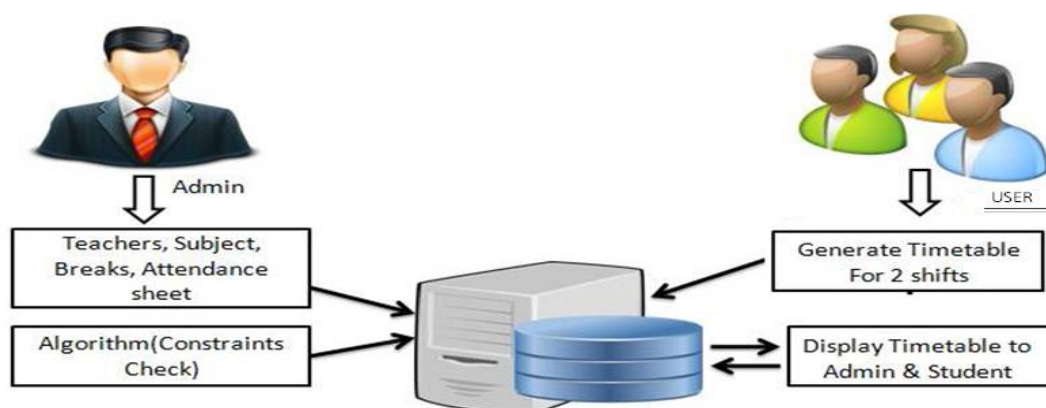


Fig.1: Proposed system architecture.

IV. METHODOLOGY & DISCUSSION

In our system we generate dynamic timetable. College start time and end time is fixed. Admin enters regulation number of subject, each subject teacher name, workload of each subject is mentioned by admin. Admin can add the subject in database and assign teachers to subject. Timetable is generated for two shifts. The Timetable is generated by considering the class rooms, labs, teacher availability. Occurrences of all subjects are also considered. In one day there will not be lab sections. Once the timetable is generated admin can import student and teacher contact information then timetable is sent to all teachers and student through email using, which is given by admin.

ALGORITHM

```
BEGIN
INITIALISE population with random solutions
EVALUATE each random solutions
REPEAT UNTIL (TERMINATION CONDITION IS SATISFIED) DO
1. SELECT PARENTS;
2. RECOMBINE(CROSSOVER) pairs of parents;
3. MUTATE the resulting offspring;
4. EVALUATE new offspring;
5. SELECT individuals for the next generation;
END
```

V. EXPERIMENTAL RESULTS

Admin enter user id and password for login. This Page, is used for authentication of admin. The entered serious and password is matched with the user id and password stored in encrypted format in database. If user id and password match then directed to home page otherwise display message to login again.



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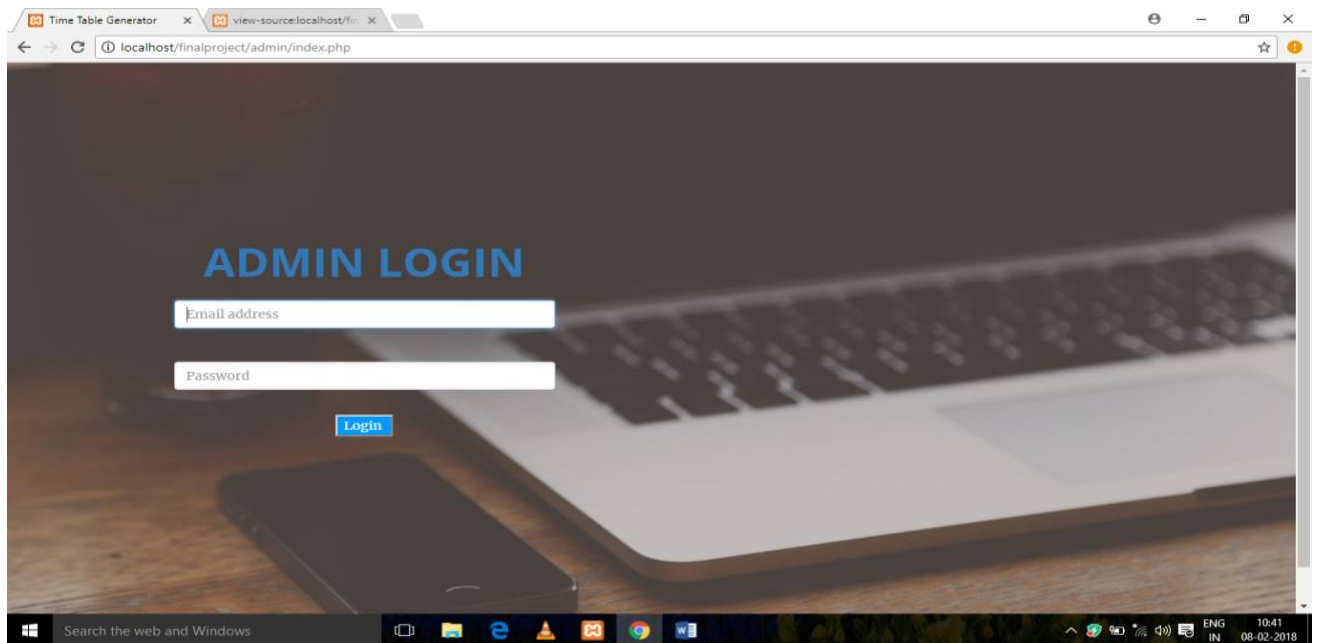


Fig.2: Admin login.

Admin adds information of teachers on this page which is used for timetable generation. The information includes name, email id, contact details and Department. This information is stored in teacher table.

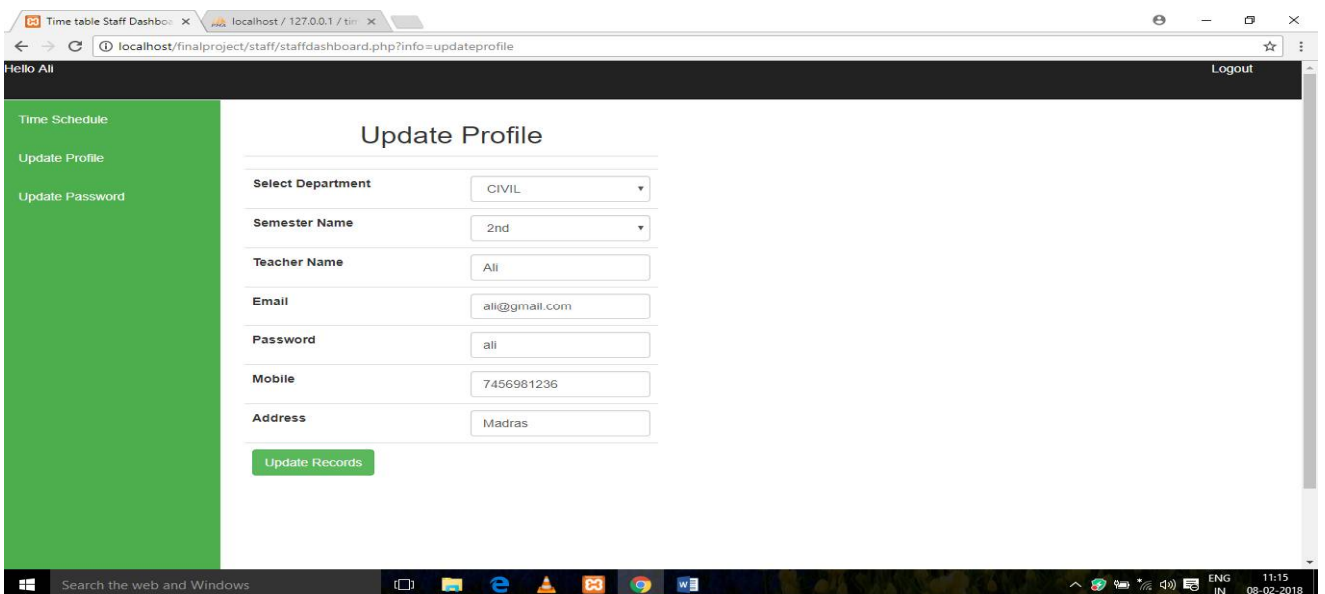


Fig.3: Teacher update profile.



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Here by using data which is stored in database timetable is generated for both the shifts parallel. It checks both hard constraints and soft constraints, while generating the timetable. Print option also available for print the timetable.

Day/Time	9.30-10.20	10.20-11.10	11.10-12.00	12.00-12.50	1.30-2.20	2.20-3.10	3.10-4.00	4.00-4.50
Monday	sub8	sub5	lb2	lb2	sub3	sub2	sub6	sub1
Tuesday	sub3	sub5	sub6	sub7	sub2	sub8	sub1	sub4
Wednesday	sub7	sub6	sub8	sub4	lb1	lb1	sub5	sub3
Thursday	sub8	sub3	lb3	lb3	sub4	sub1	sub2	sub5
Friday	sub2	sub1	sub7	sub4	sub6	sub3	sub5	sub8

Name	Subject Id	Subject Name
TEMP LAB B	21	sub1
TEMP LAB B	21	sub1
Diksha / Gaurav Agg	22	sub2

Fig.4: Timetable generation

VI. CONCLUSION AND FUTURE WORK

Time Table Scheduling application will simplify the process of time table allocation smoothly otherwise which may have needed to done using spread sheet manually possibly leading to constraints problem that are difficult to determine when time table is generated manually.

Time Table Scheduling future work includes the exam room scheduling, exam timetable scheduling, time constraint problem will be overcome.

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