

AUTOMATIC TIMETABLE GENERATOR

Prof .Pravin Patil(Guide), Jagruti Khichi¹, Mansi Jadhav², Vinayak Basa³

¹⁻³Information Technology Engineering, Padmabhushan Vasantdada Patil Pratisthan College of Engineering, Maharashtra India

Abstract – At present we are using a manual system of preparing time table in colleges with a large number of students. Here the manual system means the teacher needs to prepare the timetable which is very much time-consuming. Most colleges have several different courses and each course has several subjects. Now there are limited faculties and each faculty teaching more than one subject. So now the timetable needed to schedule the faculty at provided time slots in such a way that their timings do not overlap and the timetable schedule makes the best use of all faculty subject demands. We use a customized algorithm for this purpose. In our time table generation algorithm, we proposed to utilize a time table object.

Keywords: Time table scheduling, Genetic algorithm, Constraints, optimal solution.

1. INTRODUCTION

Although the majority of faculty organization work has been mechanized, the lecture timetable preparation continues to be usually done manually taking lots of effort and time-consuming. It is widely used in schools as well as colleges and other fields of teaching.

Other cases that can cause a problem is when the faculty number is less, the result's in rescheduling of time table or they need to fill on empty seats urgently. , suppose a case in which a teacher of a particular class for some subject is absent, then the class advisor of that class will arrange some other lecture for that period.

But at present in the existing system, she has to check which teacher is free during that period which means all the work is done manually which leads to a waste of time of the class advisor as well as of students.

While scheduling a timetable, even the smallest condition can take a lot of time and the case is even worse when the number of conditions/constraints or the amount of data to handle is more. In such cases Automated time table, scheduling can be a very convenient method for managing such problems in computers with algorithms and also proving to be eco-friendly for no paperwork.

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time table object.

1.1 Literature survey

The first paper is an Automatic timetable generator. This paper is based on a manual system of preparing time table in colleges with large no. of students where they usually end up with various classes clashing either in the same room or with the same teachers having more than one class at a time. In this Javafx is used for the front end and MYSQL is used as the backend.

The Second paper is a study on automatic timetable generators. This system is only based on theory knowledge. In this, they have shown the easiest methodology to create an automatic timetable. This project was made to reduce the use of manpower which will be taken by the staff/faculty to make one, and it will require more time.

The Third paper is Time table generation system. This project is capable of taking care of both constraints strong as well as weak effectively, by introducing timetabling algorithms used in an automated timetabling system. This system is based on HTML and XML and is used for storing the inputs in a web-based form.

The fourth paper is Practices in timetabling in higher education institutions. In this system /paper, the study of different methods to make a timetable is shown. The way of approaching to make a perfect timetable for the higher education system is shown.

1.2 Requirements

Hardware requirements

Operating system-Windows 7,8,10

Processor-

dual core 2.4GHz (i5 or i7 series Intel processor or equivalent AMD)

RAM-4GB

Software Requirements

Python

Pycharm

XAMPP

MYSQL

DJANGO

Chrome

2. METHODOLOGY

As the below flow chart explains the overall working of the AUTOMATIC TIME TABLE GENERATOR System. It includes soft and hard constraints, input as student details, teacher details, and subject details. By using this collection of input from using the system will generate an optimized time table

Firstly the system contains Login Page. The User has to login first with the valid user-id and password which in turn opens the Home Page which contains the information about the AUTOMATIC TIME TABLE GENERATOR System.

It also has the various link tabs on the menu bar to navigate to other pages but it will work if and only if the user is logged in to the system. Once the user gets logged in he/she will get the approval to use the next page which is to add subjects where the subject name, semester, Timings, and other such required details input will be given by the user.

As the details related to subjects and semester is filled by the user it will get reflected and saved into the database.

Once the system gets the subject detail it will take the user to the next page where the user needs to add the faculty information i.e. the faculty name, which faculty will be taking which subject, and whether it will be a theory session or practical, etc. . And this details will also get saved into our dataset.

Now the system has all information related to subjects, teachers, semesters, Labs, Theory, timings, etc. So now it will ask the user from the given semester details for which semester the user wants to generate a timetable i.e. ODD Semester / EVEN Semester. All these data inputs will get saved and collected in our dataset and after this, the user will click on the generate button of the system, based on all the information and constraints the Automated timetable generating System will generate an optimized timetable in Excel Sheet and the user can download the sheet from the system into their device

2.1 Objective

To develop an efficient and effective system that generates an accurate timetable based on user inputs. To save time and effort and reduce errors. To develop a User interface(UI) that provides smooth integration as well as a paperless environment, which is user-friendly, takes input from the user, and generates the timetable.

3. EXISTING SYSTEM

In the Existing System, the whole process of making a timetable is done manually by taking care of all the possible constraints high as well as small constraints. The most tedious task of preparing a timetable is from the educational system, especially the University Timetabling. Here a specific teacher/lecturer is charged with the responsibility of creating an optimal timetable manually, the teacher/lecturer needs to take care of all possible constraints like should have the proper information of the total count of students, faculty members, proper time arrangement, etc. In case of teacher absence, he/she who is responsible for timetabling needs to arrange another lecture at that time, which means a single person individually is handling so much responsibility that is very much time consuming as well as a hectic work for the lecturer.

3.1. ADVANTAGES OF EXISTING SYSTEM

Can be made better through collaboration with the different entities involved as it is subjective. Changes may be done faster on time only for specific conditions and not for all.

3.2. DIASADVANTAGES OF EXISTING SYSTEM

Very confusing and time-consuming method for manual creation, as well as hectic job for lecturer as lost of effort, is put by them for it.

4. PROPOSED SYSTEM

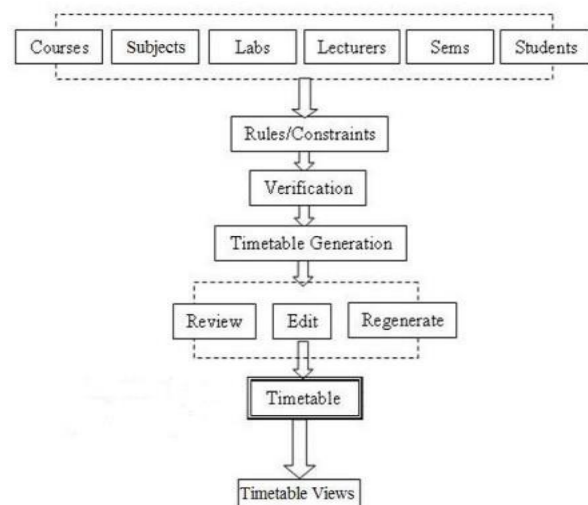


Fig-1: Proposed System Flowchart

As shown in the figure above, the process starts with the collection of datasets. For the dataset, it will first take the input from the user regarding the information related to the

timetable such as "Courses, Subjects, labs, Semester" etc.

The next step is to apply certain Rules/Constraints to the user input. E.g.- If we are taking input for lectures so the system should look after the clashes issues such that there should not be the same lectures for the same faculty at the same time.

After this, all the constraints and possibilities are been verified which further leads to timetable generation. Now, the final timetable will get generated.

In the further process, the user will review the generated timetable and suppose wants to edit the timetable as he/she is not satisfied with the generated one then the user can regenerate the timetable again.

After this, a final regenerated timetable will get generated. And in the final process, the timetable will be viewed by the user.

4.1. ADVANTAGES OF PROPOSED SYSTEM

Unlike the existing system, it Saves time and efforts

It also reduces confusion and error.

It simplifies the process and gives easy customization, smooth integration, and easy calculation.

It provides a paperless environment.

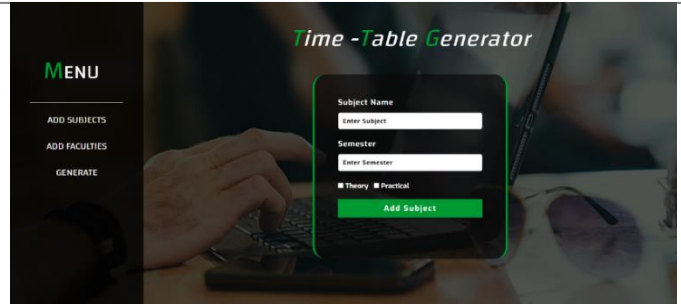
60-80% optimum timetable gets generated.

4.2. DISADVANTAGES OF PROPOSED SYSTEM

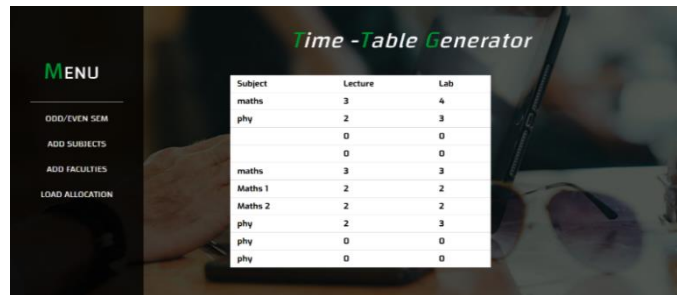
Based on only a few course constraints the proposed system can generate timetables.

The proposed system can only generate timetables for a particular class at a time. In the system, most of the genetic algorithm principles are implemented but not all of them are covered totally.

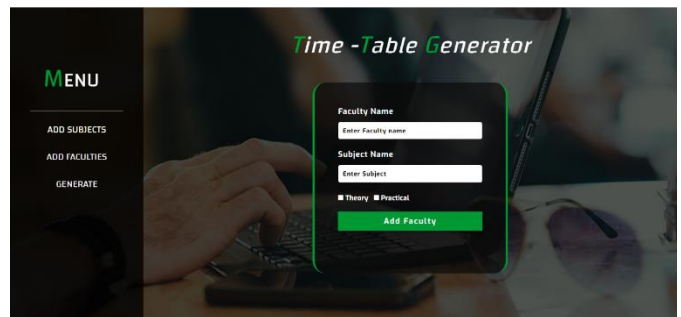
5 RESULT ANALYSIS



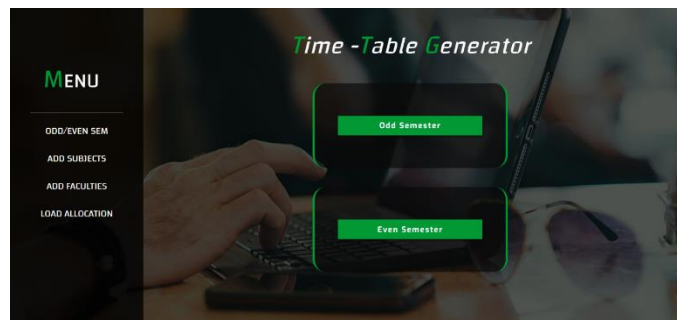
2(A) ADD SUBJECT



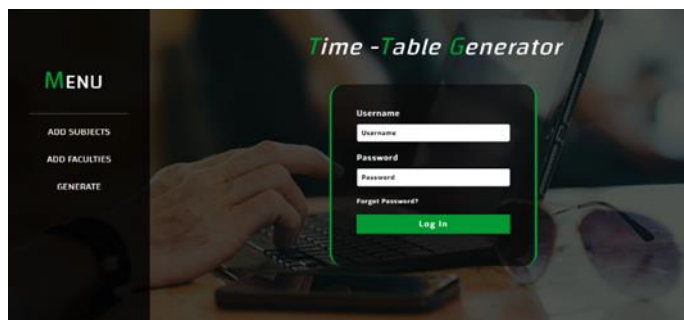
2(B) ADD SUBJECT



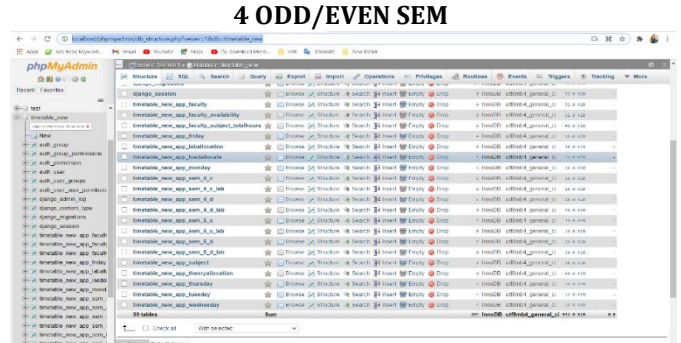
3 ADD FACULTY



4 ODD/EVEN SEM



1 LOGIN PAGE



5 DATABASE

6. FUTURE SCOPE

In our system, there are some problems those are user has to format it a bit after it is prepared. The system will generate a particular class timetable at a time and once the user downloads the current timetable sheet then the next timetable can be generated. In future work, we will overcome these disadvantages by using some logical approaches.

7. CONCLUSION

This paper addresses the Timetabling Issues, real-life problems faced by many educational institutions till now. Since, it is a very complicated task for a single staff to handle many Faculty's and allocating subjects for them at a time, physically. So our proposed system will help to overcome this disadvantage. Generally, this system can be considered a useful system since it helps the teacher to improve their process of preparing the timetable. Separate timetable for the individual class, faculty, and labs are generated automatically by the system that will save the time and effort of the teacher as well as no more paper wastage will be there and possibly solving all constraints problems smoothly that are difficult to determine when time table is generated manually and helps to provide an optimal solution.

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