

## Automatic Timetable Generator

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### Abstract

The Automatic Time Table Generator is a solution for our colleges existing manual system. The machine will accept all of the necessary inputs and process them in order to produce the timetable. Many restrictions are needed to generate a good time table. Combinatorial problems are defined declaratively in terms of constraints in constraint programming. Constraints are relationships between problem variables that describe the solution space by placing constraints on the values that the variables will take at the same time. Since colleges have varying instructional strategies, the time table problem can take several form Nevertheless, there are a number of entities and restrictions that are shared by both of these combinations. First and foremost, this project suggests using global constraints to model the basic core of College timetable issues. Then, using our logics, we're building a machine that can create the timetable automatically, taking into account all of the variables that go into creating a timetable, such as lectures, subjects, faculty, workload, and so on. Furthermore, the final product, or what we may call the consequence, must be free of all disputes.

**Keywords: Combinatorial, Constraint, Entities, Variable**

### INTRODUCTION

#### a) Project Objectives

Automatic Timetable Generator is a Java-based programme that automatically generates timetables. The schedule is now maintained by hand. It will assist in the automated management of all times which will also benefit faculty. For the efficient generation of timetables, a Faculty's work load for a week will be listed. . It's a comprehensive timetable management solution for colleges that helps them solve the difficulties of manually creating schedules. Faculty would be able to receive a timetable in no time by using this app.

#### b) Motivation

Most colleges offer a variety of classes, each with its own set of subjects. There are now just a few faculties, and each one teaches multiple subjects. Now the time table required to schedule the faculty in provided time slots so that their schedules did not clash and the time table schedule allowed the best use of all faculty subject demands. So it is a time taking process to make a time table manually. That's why we thought of building a project on this topic that will save the time.

#### c) Problem Identification

Normally, time tables are generated by Manually. As we all know, each institution/organization has its own schedule, which will be difficult to manage and sustain. Taking workload into account when preparing this schedule would make it more difficult. As previously reported, when designing a schedule, the maximum and minimum workload in a college should be considered.

#### **d) System Requirements:**

This system is implemented using the minimum hardware requirements like RAM 512MB and above, hard disk used is 20GB or above, processor used is 2.4GHz or above, display is standard output display and data input is keyboard/mouse.

Software requirements deal with defining software resource requirements and prerequisites that need to be installed on a computer to provide optimal functioning of an application. These requirements or prerequisites are generally not included in the software installation package and need to be installed separately before the software is installed.

Languages used are *Java, HTML, CSS*, *Database* used is *MYSQL*, Compiler is Net Beans, Operating system is Windows 10.

## **II. LITERATURE REVIEW**

### **a. Theoretical Concepts**

We can see that time table generation is performed manually in the current setup. Manually changing the timetable if there is a disagreement is a major challenge for Automated Time Table Generator, which controls the As we all know, each institution/organization has its own schedule, so coordinating and sustaining it would be easy. Taking workload into account when planning this schedule would make it more difficult. As previously said, when creating a timetable, the optimum and minimum workload in a college should be considered. In that scenario, creating a schedule would become more difficult. Timetable automatically to overcome all conflicts

### **b. Technical Concepts**

This method is theoretically feasible because it only includes the hardware and software resources that are already present in the system. It necessitates the installation of JAVA and MYSQL, all of which are available for download. Furthermore, the latest system would keep the Automatic Timetable Generator's expandability. If new modules are required in the future, they can be applied to the framework later. Automated Timetable Maker The source code in the Java programming language is written in plain text files with the Java extension.

The Javac compiler then compiles such source files into class files. A. class file does not contain native code for your processor; instead, it contains byte codes, which are Java Virtual's machine language. As of 2008, MySQL is the most commonly deployed open source Relational Database Management System (RDBMS), which operates as a server and enables multiple users to access multiple databases[3].

It is named after the daughter of co-founder Michael Widenius. Structured Query Language is the acronym for Structured Query Language

## **III. EXISTING SYSTEM**

Generally timetable generation is done manually. Present day preparator of timetable use MS EXCEL and MS WORD. This way of preparing timetable doesn't make the system efficient and makes it look more complex it is also a time consuming process.

### **Issues in Existing System:**

As we know all institutions/organization have its own timetable managing and maintaining these will be difficult . Considering the workload of staff will make the scheduling part of timetable more complex

. Because of these constraints managing staff with respect to their workloads will be difficult.

## **IV. PROJECT SCOPE**

Timetable Generation System generates timetable for each class and teacher, in keeping with the availability calendar of teachers, availability and capacity of physical resources such as classrooms and rules applicable at different classes, semesters, teachers and subjects level. Best of all, this Timetable Generation System tremendously improves resource utilization and optimization.

## **PROPOSED SYSTEM**

The final system would be able to produce time tables completely automatically, saving the institute administration a lot of time and effort. In order for us to be able to work well for a variety of schools, colleges, and universities. Handling with user- defined limits. Ease of use for the system's operator so that he or she can create an automated timetable. Focus on optimization of resources i.e. teachers, labs etc. Generate multiple useful views from time table.

### **Constraints:**

There are a variety of constraints to be satisfies the time to instantiate variables about time slots and classrooms. The constraints can be categorized into Hard and Soft constraints.

#### ***Hard Constraints:***

Hard constraints are the one's which needs to be fulfilled necessarily. Hard Constraints A timetable which breaks a hard constraint is not a feasible solution.

1. **No students can attend more than one lecture at a time.**
2. **No lecturer can teach more than one subject at a time.**

**No room can occupy more than one lecture at a time.**

#### ***Soft Constraints:***

These are the constraints that are not that obvious but still demanding. They are not to be really satisfied but the solutions are generally considered good if large numbers of them are taken care. Soft constraints are less significant than hard constraints, and it is typically not possible to avoid breaking at least some of them. Either timetable technique is functional, which

1. **No consecutive lectures of the same teacher in the class.**
2. **Minimize continuous lectures of the same course in a day.**
3. **Same teacher must not have consecutive periods unless specified.**
4. **Assigning fixed slots for particular subjects**

Outcomes depend on:

### **1. Interface for input**

The system is easy to use and interactive interface to enter all the inputs like the teacher name and the data for subject.

### **1. Database Capabilities**

The system has a well-designed database that will contain all of the data that will be submitted as input. Database for keeping generated timetables and storing required time tables, with basic information, topics, students, batches and their associations, and other data.

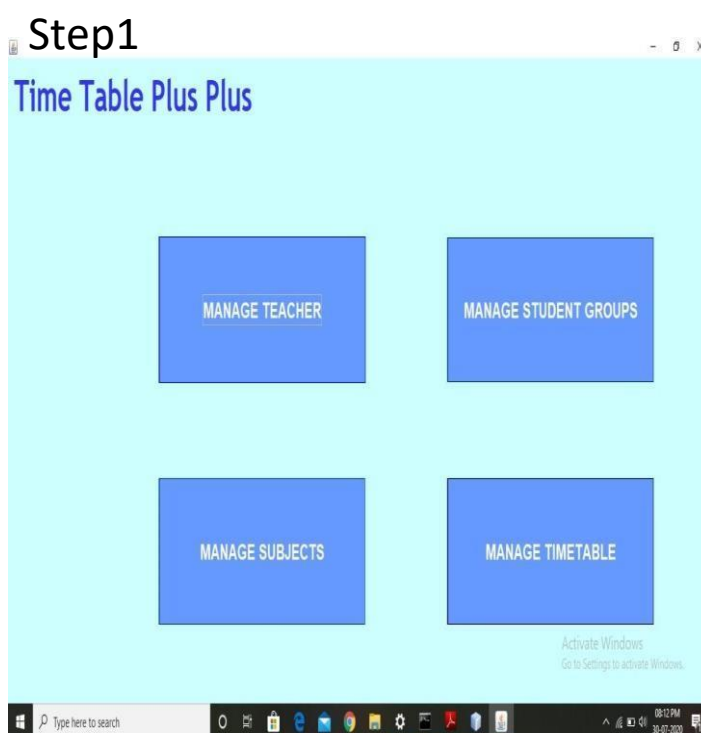
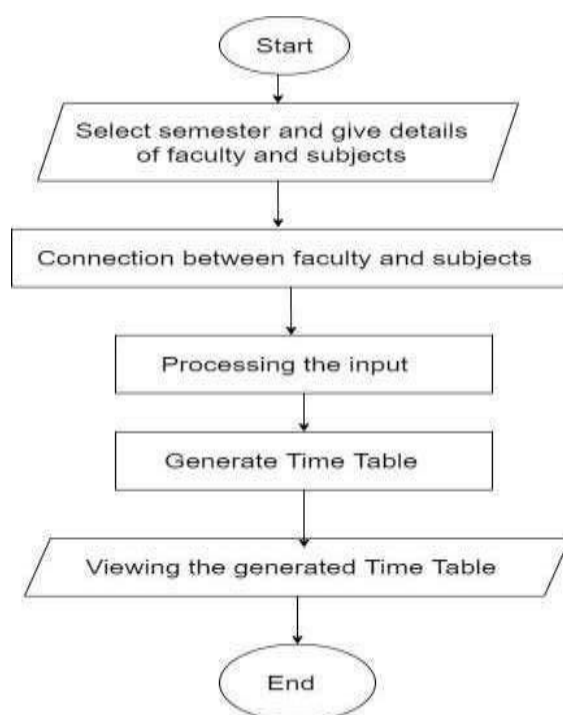
### **1. Processing Capabilities**

The framework is designed to handle all of the data in the database by considering the different constraints.

### **1. System Architecture**

**2. Architecture for Timetable Production:** Abstractly speaking, software architecture describes the elements of a system. It also depicts the relationships between these elements, as well as the models that control its structure and their constraints. When confronted with a difficult problem, it's usually better to break it down into manageable parts that are simpler to solve with simple solutions. . Then, when we combine all these small solutions, we can find the solution to our complex problem.

(i) **Flow chart of Timetable Scheduling Process:** This diagrammatic representation illustrates a solution model .



## Step 2

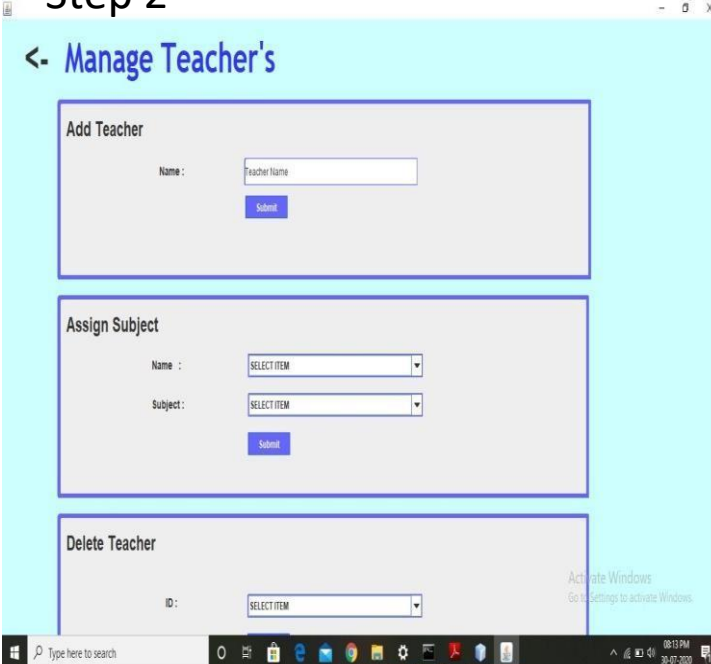
### <- Manage Teacher's

**Add Teacher**  
Name :

**Assign Subject**  
Name :   
Subject :

**Delete Teacher**  
ID :

Activate Windows  
Go to Settings to activate Windows.



## Step 3

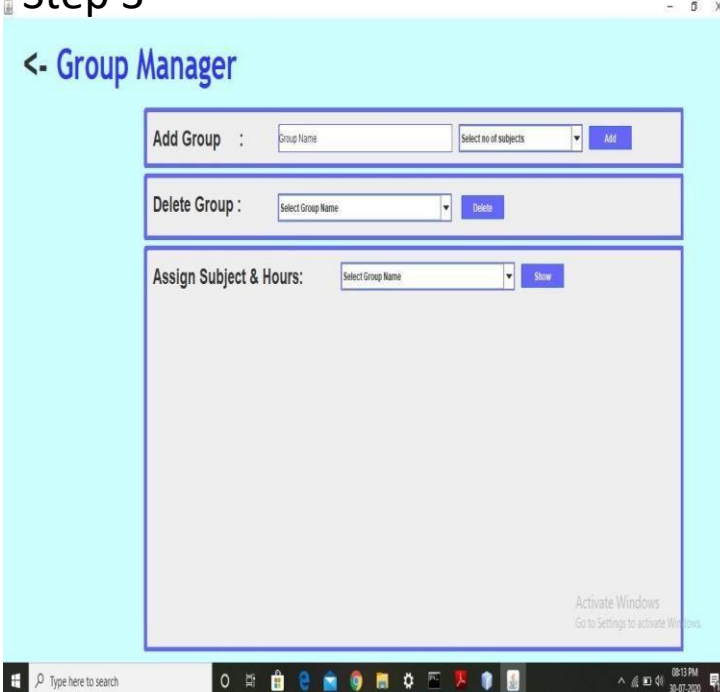
### <- Group Manager

**Add Group :**

**Delete Group :**

**Assign Subject & Hours:**

Activate Windows  
Go to Settings to activate Windows.



### <- Manage Subject's

#### Add Subject

Subject Name :

Subject ID :

#### Delete Subject

ID :

Activate Windows  
Go to Settings to activate Windows.

### <- Manage Time Table

Select Group Name

Activate Windows  
Go to Settings to activate Windows.

### <- Time Table Generator

	09:00 AM	10:00 AM	11:00 AM	LUNCH 12:00	01:00 PM	02:00 PM	03:00 PM
MONDAY	MP : Sumit	Free : NO_ALLOCATION	Computer Network : Bhargava	Free : NO_ALLOCATION	EEC : Ruchi	Operating System : Heenaakshi	EEC : Ruchi
TUESDAY	HVPE : Smriti	Computer Network : Bhargava	Free : NO_ALLOCATION	Free : NO_ALLOCATION	MP : Sumit	HVPE : Smriti	HVPE : Smriti
WEDNESDAY	Free : NO_ALLOCATION	Computer Network : Bhargava	Computer Network : Bhargava	Free : NO_ALLOCATION	MP : Sumit	Free : NO_ALLOCATION	MP : Sumit
THURSDAY	Computer Network : Bhargava	Operating System : Heenaakshi	EEC : Ruchi	Free : NO_ALLOCATION	Computer Network : Bhargava	Computer Network : Bhargava	HVPE : Smriti
FRIDAY	EEC : Ruchi	Free : NO_ALLOCATION	Operating System : Heenaakshi	Free : NO_ALLOCATION	Operating System : Heenaakshi	Computer Network : Bhargava	Free : NO_ALLOCATION
SATURDAY							

Activate Windows  
Go to Settings to activate Windows.

## IMPLEMENTATION

Implementation is a phase where all that we thought of comes into the picture. This system is implemented using the minimum hardware requirements like RAM 512MB and above, hard disk used is 20GB or above, processor used is 2.4GHz or above, display is standard output display and data input is key board/mouse. All the modules of our project are building using software development approaches. Software requirements deal with defining software re source requirements and prerequisites that need to be installed on a computer to provide optimal functioning of an application In our project, languages that we have used are HTML, PHP, Database used is MYSQL.

The proposed system is implemented using the following modules:

### A. Subject managementModule

In this option, user can add and delete different subjects by going through two different panels

In first, user have to give Subject Name and subject id to add that particular subject to the list of Software to be used for assigning teachers and creating time table according to it.

In second, user has to only select Subject Id to delete that particular Subject associated with that Id.

### B. Teacher management Module

In this option, user can add teacher and assign Subject from the list we have created by previous option or user can delete the Delete teacher from the record.

In first, user only needs to give the name of the teacher to add to the list of the teacher.

In second, user have to first select Teacher from the list of the teacher list we have created in this interface and then select the subject from the list we have created in previous option to assign that subject to that particular teacher.

In third, user has to select the particular teacher to delete that teacher from the list of the teacher.

### a. Student management groupsModule

In this option of the launch screen, user can add group with a particular number of Subjects , user can delete a previous defined group and can assign different subject to the students of that particular group from the list of subjects we have created in Previous option.

- In first, user has to give group name and number of Subjects to add that group.
- In second, user only has to select particular group from the list to delete that group
- In third , user have to first select group name then have to add subject to that group along with the number of class user wanted that subject class in a week.

### b. Manage TimetableModule

In this option, user can generate time table as well as View the generated time table of the particular selected group name from the list of groups of student with different subject created in previous option.

In this, users have to select the group name then click on the “Generate Time Table” button to create time table. Then, user can view the previous generated time table by clicking on the “View Time Table” button to view it. By clicking on the “Generate Time Table” button this below screen will

appear to manually select the number of classes per week.

As first user have to select the day of the week and then hour of the selected day and then Subject from the list.

We have created in first option of launch screen and then click on the “Add” button to add and then after adding all subject to the day and it’s hour click on the “Auto Generate” button to generate the Time Table.

By clicking on the “View Time Table” the screen with the generated time table will appear in front of the Screen.

## RESULT AND ANALYSIS

The final system should be able to generate time tables in completely automated way which will save a lot of time and effort of a department administration. Focus on optimization of resources i.e., teachers, classrooms etc. Provide a facility for everyone to view the timetable.

This application is provided with necessary details of faculty and subjects which are stored in database and then by making use of available data it generates timetable with minimum time when compared to manual generation of timetable.

## CONCLUSION

### *Salient features of the system:*

- Automatic Timetable manger is a Java based software used to generate timetable automatically.
- Proposed system will help to generate it automatically also helps save the time.
- There is no need for Faculty to worry about their timetable.
- It is a comprehensive timetable management solution for Colleges which help to overcome the challenges in current system.

Managing different faculties and allocating subjects to them at the same time is a daunting task. As a consequence, the method we recommend would aid in addressing this drawback.

Thus we can produce timetable for any number of courses and multiple semesters. This system will help to create dynamic pages so that for implementing such a system we can make use of the different tools are widely applicable and free to use also.

The main advantage of this project is that it allows users to store information in one location and view it via Monitor. Students will see the schedule with a fast turnaround instead of doing boring paper work. This method is easy to use and produces timetables quicker and more efficiently, saving time.

There are few points that justify the need of this system:

- user friendly
- faster and better generation of time table
- Saving time and manpower