User Manual

for

Time-Table Generator

Version 1.0

CS-08

Indian Institute of Information Technology Vadodara

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Revision History

Version	Date	Name	Description
1	05/10/2018	Kirtika Singhal	Initial Document
2	25/10/2018	Mayank Pathela	Add Register to using the system

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1.Introduction

1.1 Overview

This document provides information about how to operate the application. It defines the goals and scope of the application, providing a heuristic[1] solution. This implies that our solution may not be optimal, it will be close to the optimal[2] solution. This document will illustrate the Functional Requirements to show the system features and expected user interaction.

1.2 Goals and Objectives

The goal of the software application is to provide a possible timetable solution with the minimum number of clashes between slots. It relieves the user of much of the hard work required for generating timetable manually, leaving him with more time to apply the skills and judgment where they are needed in order to produce a timetable of the highest quality. The goal is achieved by using a constraint-based programming[3] approach.

1.3 Scope

This software can be used by any school. The algorithm designed satisfy all the hard constraints[4] mentioned below:

1. A Teacher should have only one class at a time.
2. A student should have only one class at a Time.
3. There should be no free period between the lectures for a class of students.
4. Each class has a fixed number of lectures in a day.

1.4 Authorized Use Permission

Only teachers in the school can log in and view the generated timetable. Access to the TimeTable Generator backend is with administrator only.

1.5 Organisation of the manual

1. **Introduction**
   This section contains an overview of the document, goals, and scope of the project.

2. **System Summary**
   This section is an overview of the functionality the TimeTable Generator contains in non-technical terminology.
3. **Getting Started**
   This section contains the information to get started in using the system, which includes logging in and out of the system as well as the different main menu options and what they do.
4. **Using the System**
   This section contains the information about using the system, going into detail all the possible system functions, such as adding, editing, and deleting data.
5. **Future Enhancements**
   This section contains the information about what could be added in the future to make the system contain more functionality.

2. System Summary

2.1 System Configuration

TimeTable Generator is a desktop application and requires a connection to the Internet in order to save data to the database.

2.2 Data Flows

Users input text by using the keyboard. And the data entered by admin for generating the timetable get stored in the database. The application will never allocate any one teacher to two classes at the same time, and it will always show the slots for which clashes occur.

2.3 User Access Levels

Admin: The admin for timetable creation will have access to the backend. He/She can add or remove different teachers and subjects. Also, he/she has to make a decision to allocate a clashed slot to a set of teacher, class, and subject when the generated timetable shows clashes for some slots.
Teacher: A teacher has a choice whether to view the complete generated timetable or the slots allocated to him only.

3. Getting Started

3.1 Register

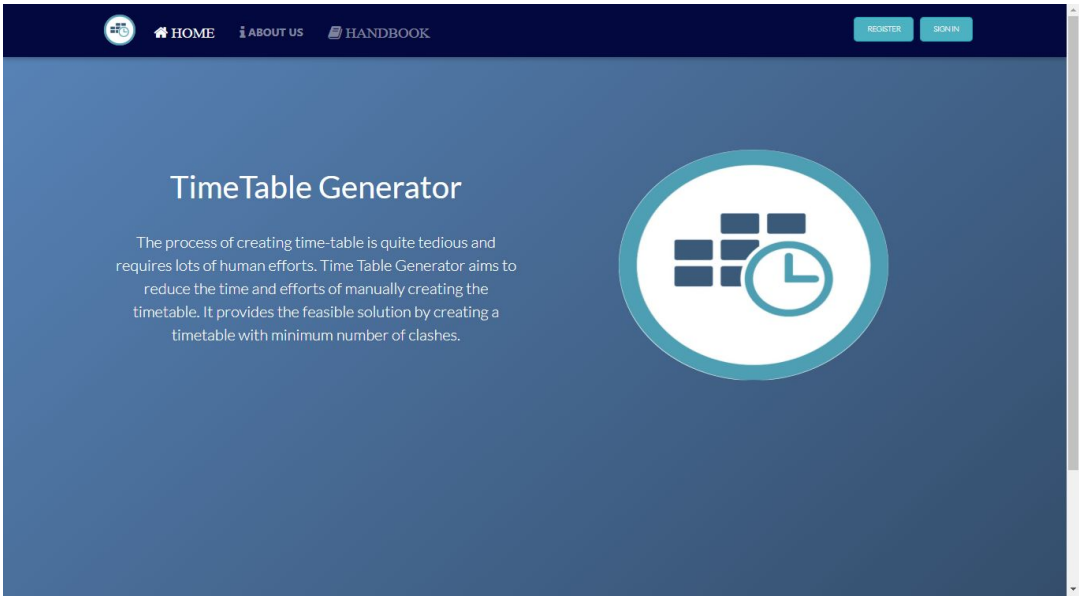
The new users need to first register to access the functionality of the application. They need to provide a valid email address and a password. This data will be stored in the database.

3.2 System Menu

When a visitor first appears on the main page, there will be a top header menu (that will appear on all pages) containing menu links.

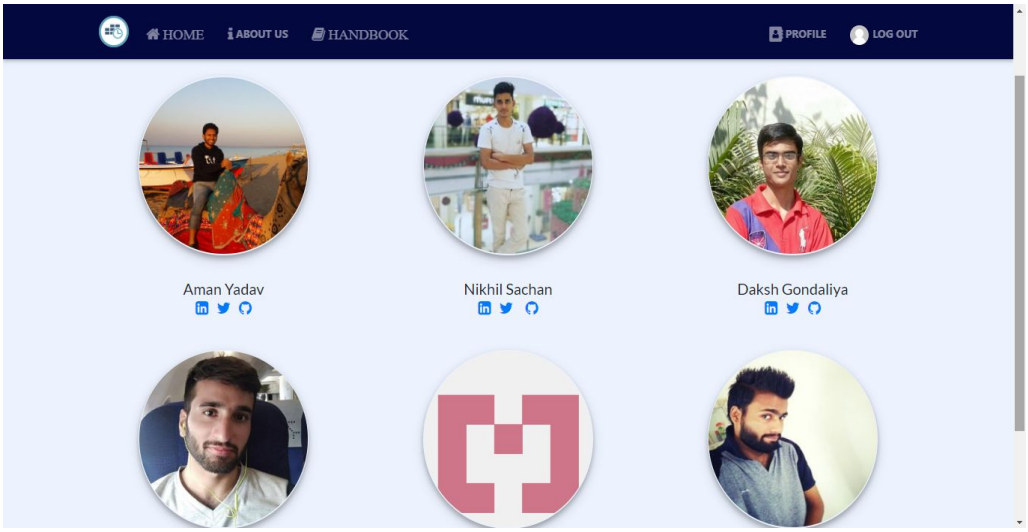
3.2.1 Home

This link will redirect the user back to the TimeTable Generator main page.
The page will look like shown below:



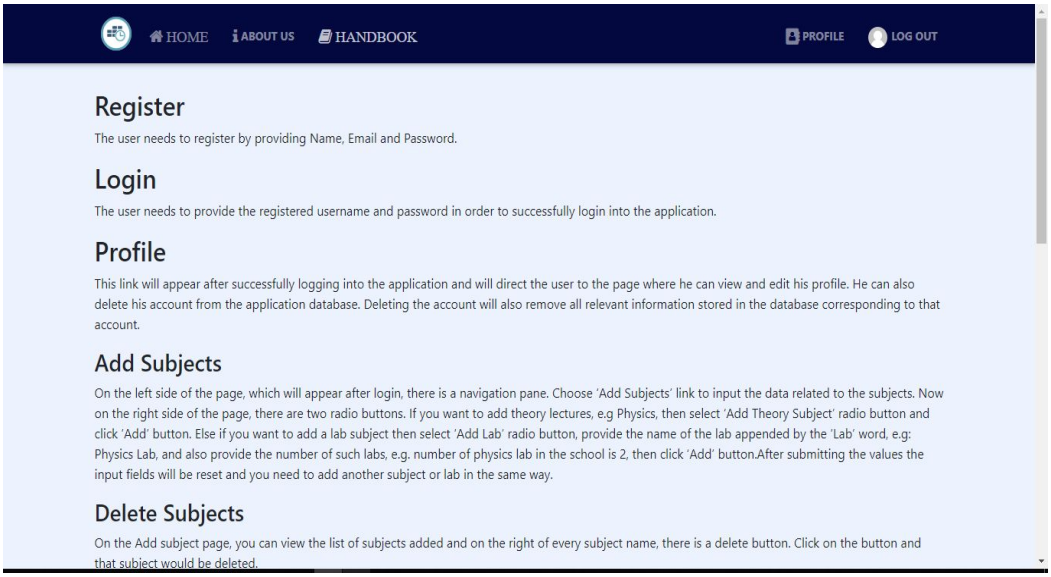
3.2.2 About Us

This link will direct the user to the page where information regarding the developers of this application is provided. Their LinkedIn and Github links are mentioned. The page looks like shown in the image below:



3.2.3 TimeTable Generator Handbook

This link will take the users to a page where they can learn how to operate the application.



3.2.4 Register

The user will be directed to the page for registration. More details in the next section.

3.2.5 Login

This link will take the users to the page where they will be asked to log in. More details in the next section.

3.2.6 Profile

After logging into the application, the user can view his/her profile. Details are provided in the next section.

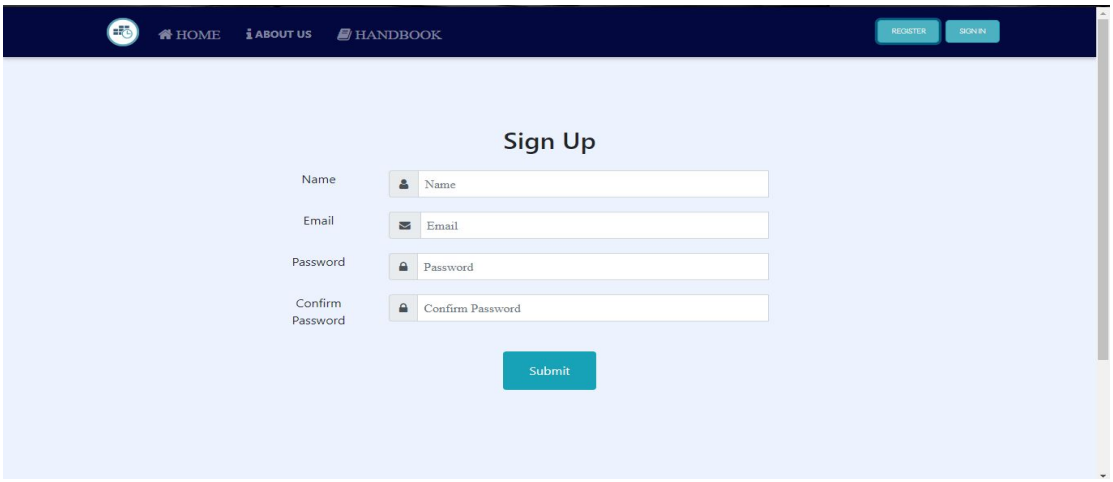
3.2.7 Log Out

The user can log out from the application by clicking this button present in the top navigation bar and would be redirected to the home page.
Also, the user will be automatically logged out from the application after six hours of login.

4. Using the System

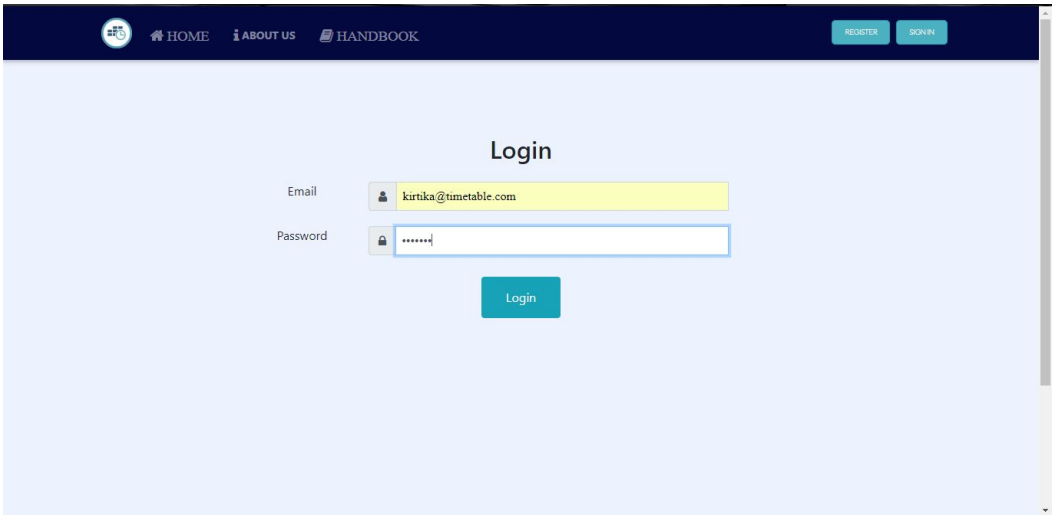
4.1 Register

The user needs to register by providing Name, Email, and Password.



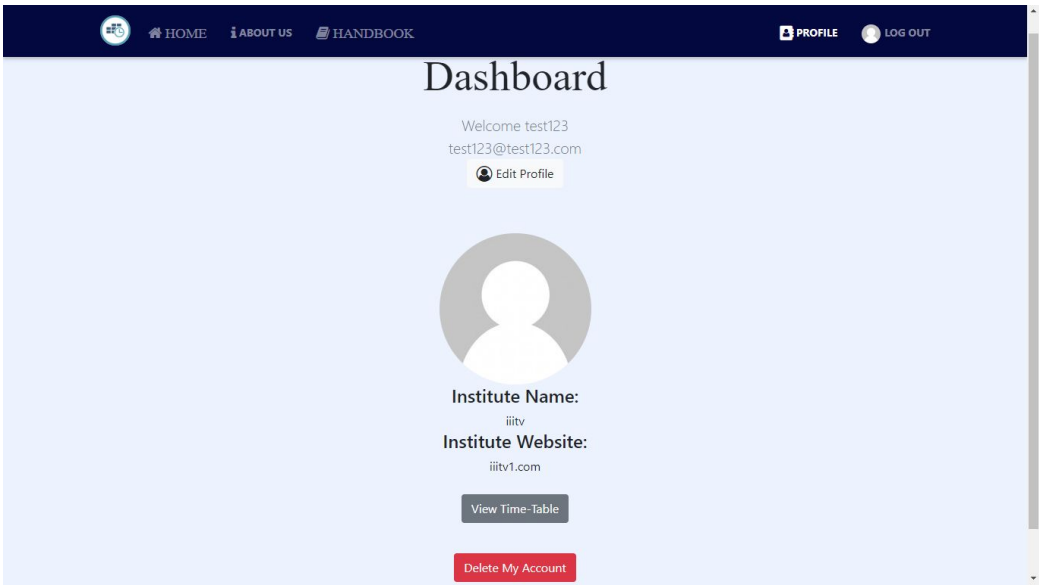
4.2 Login

The user needs to provide the registered username and password in order to successfully login into the application.



4.3 Profile

This link will appear after successfully logging into the application and will direct the user to the page where he can view and edit his profile. The user can view the generated timetable by clicking on the View TimeTable button. He can also delete his account from the application database. Deleting the account will also remove all relevant information stored in the database corresponding to that account.

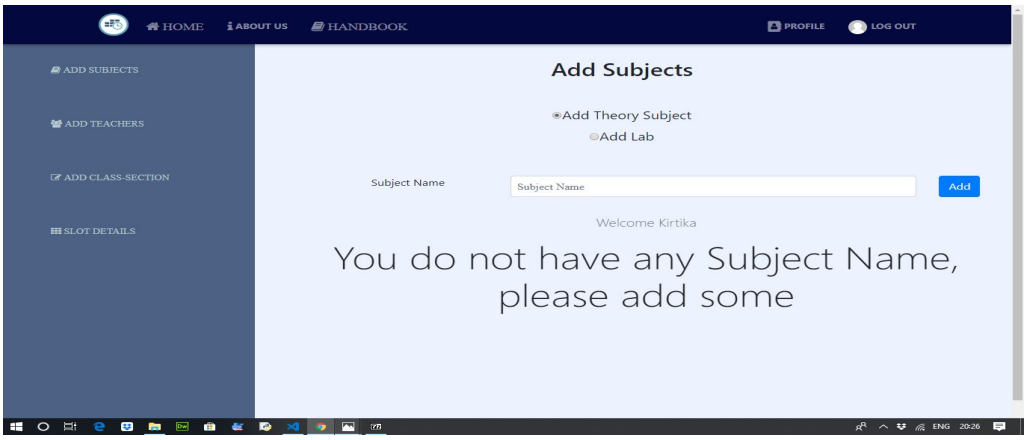


4.4 Features

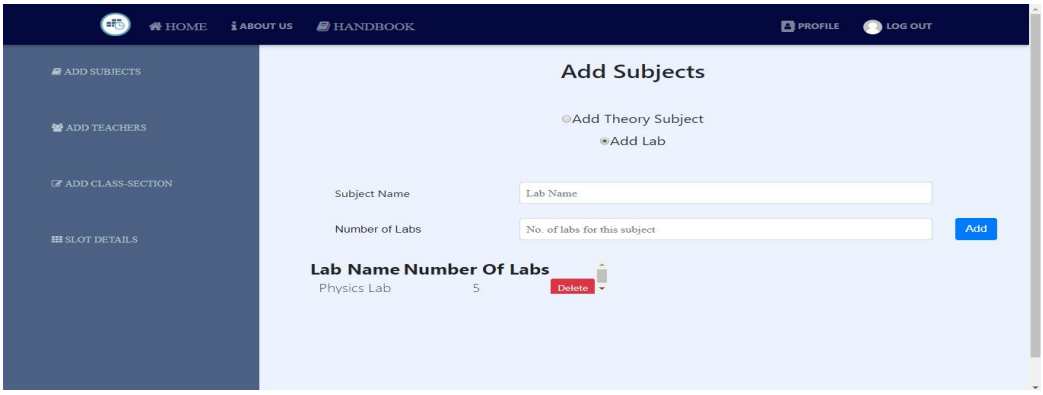
4.4.1 Add Subjects

On the left side of the page, which will appear after login, there is a navigation pane. Choose ‘Add Subjects’ link to input the data related to the subjects. Now on the right side of the page, there are two radio buttons. If you want to add theory lectures, e.g Physics, then select ‘Add Theory Subject’ radio button and click ‘Add’ button. Else if you want to add a lab subject then select ‘Add Lab’ radio button, provide the name of the lab appended by the ‘Lab’ word, e.g: Physics Lab, and also provide the number of such labs, e.g. number of physics lab in the school is 2, then click ‘Add’ button. After submitting the values the input fields will be reset and you need to add another subject or lab in the same way.

Add theory subject:

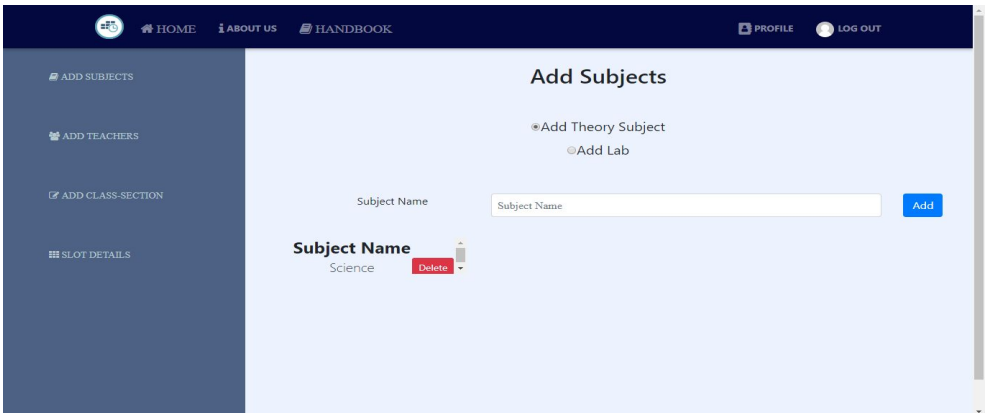


Add Lab subject:



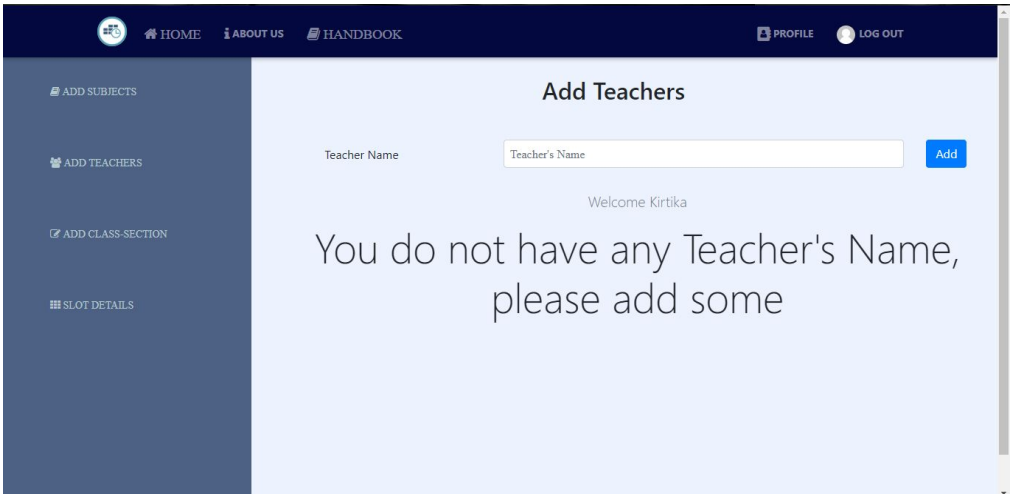
4.4.2 Delete Subjects

On the Add subject page, you can view the list of subjects added and on the right of every subject name, there is a delete button. Click on the button and that subject would be deleted.



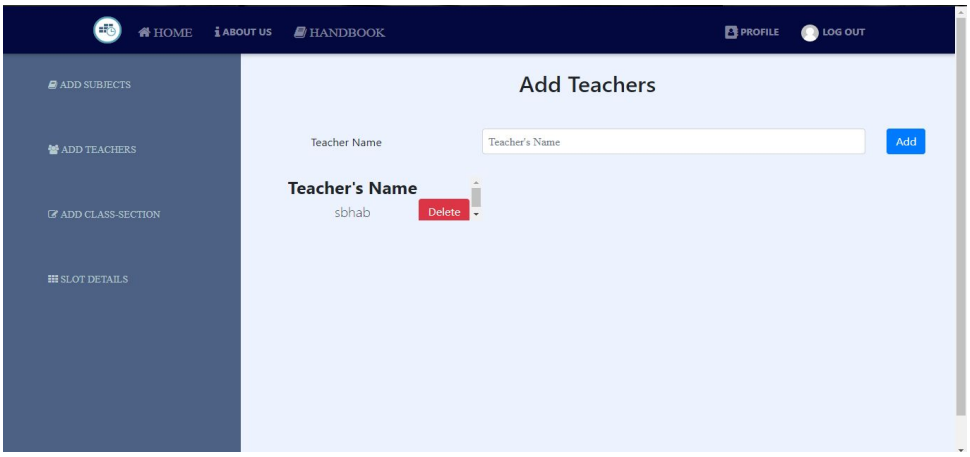
4.4.3 Add Teachers

If you want to add the name of teachers, then simply click the ‘Add Teachers’ link on the left side navigation pane and then enter the name of the teacher and click ‘Add’ button. After that, the input field will be reset and continue adding in the same way. If there is more than one teacher of the same name, then no need to enter the same name again.



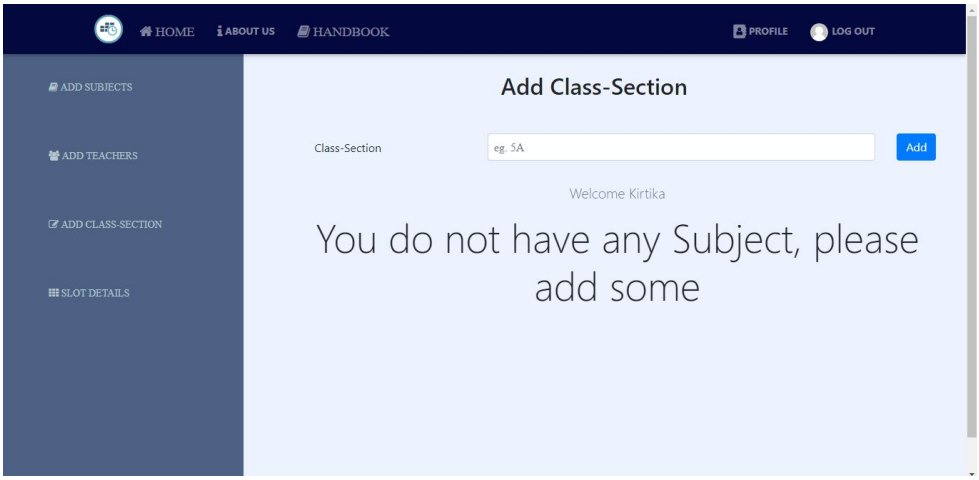
4.4.4 Delete Teachers

On the Add Teachers page, you can view the list of teachers added and on the right of every teacher name, there is a delete button. Click on the button and that teacher name would be deleted.



4.4.5 Add ClassSection

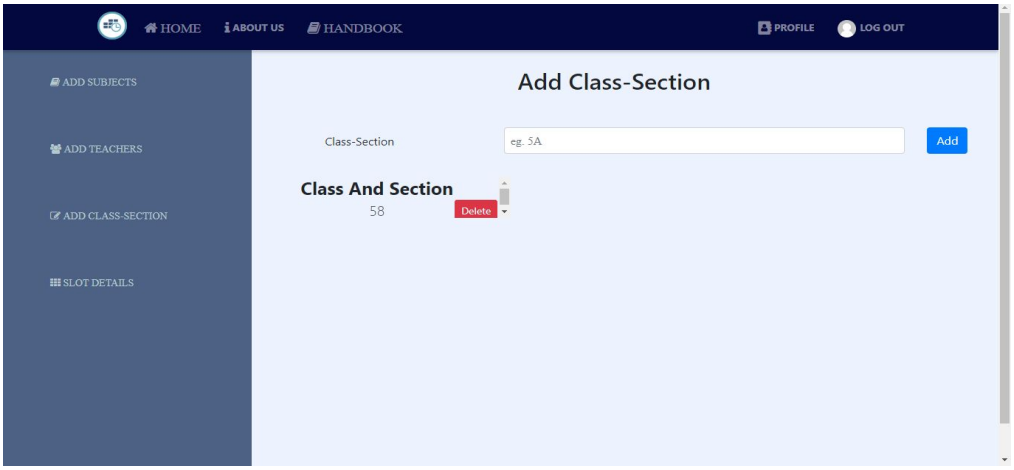
If you want to add class and section then click the ‘ClassSection’ link on the left side of the navigation pane and then you can fill in the necessary values in the input field on the right side.



Some conventions are: Suppose the class is 5^{th} and the sections are A, B, and C, then fill in the values in the form of class appended by section e.g, 5A. Then click the ‘Add’ button. The input field will reset and you need to fill in another value in the same way.

4.4.6 Delete ClassSection

On the Add ClassSection page, you can view the list of ClassSection added and on the right of every ClassSection name, there is a delete button. Click on the button and that value would be deleted.

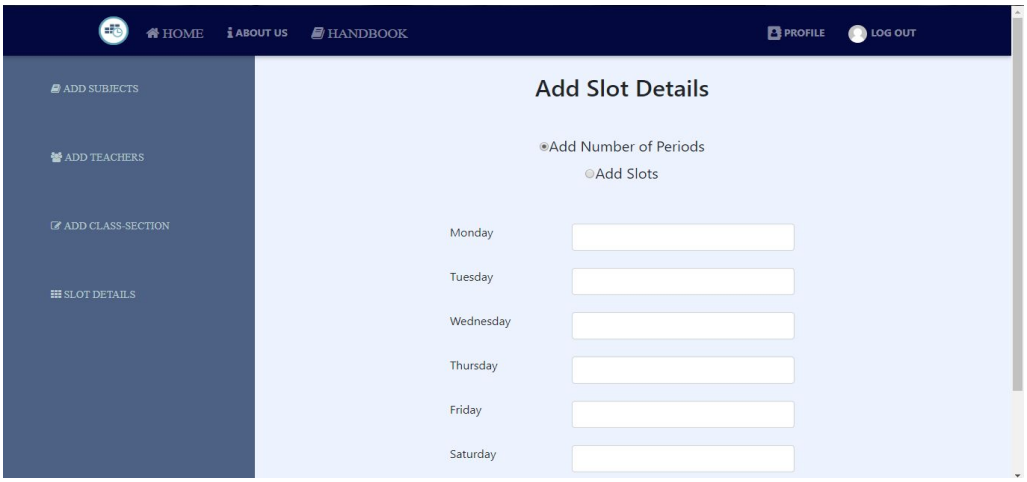


4.4.7 Add Slots

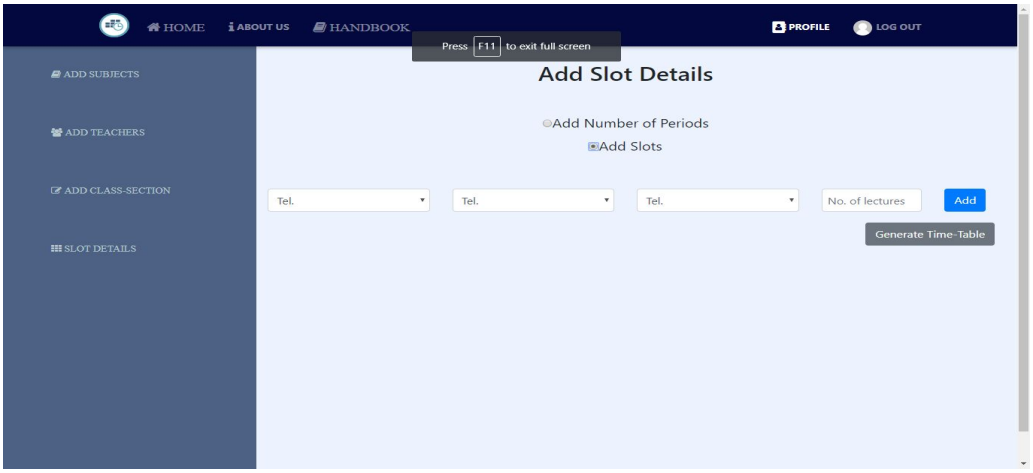
After filling in the data separately you can now make the sets of the teacher, subject, classSection and the number of lectures for that particular set. Eg, in the classSection *5A* teacher *XYZ* teaches Physics subject and the number of lectures per week taken by him is 4, then you need to select the name of the teacher, subject name and classSection from the dropdown list and input the number of the lectures. After this, you need to click ‘Add’ button and the values of the fields will be reset. You need to do this for all the sets.

You need to provide the number of periods for all the classes for each day. For e.g, Tuesday is half-day for all the classes, the number of periods on Tuesday should be 4.

Add number of periods for each day:



Add Slot Details:

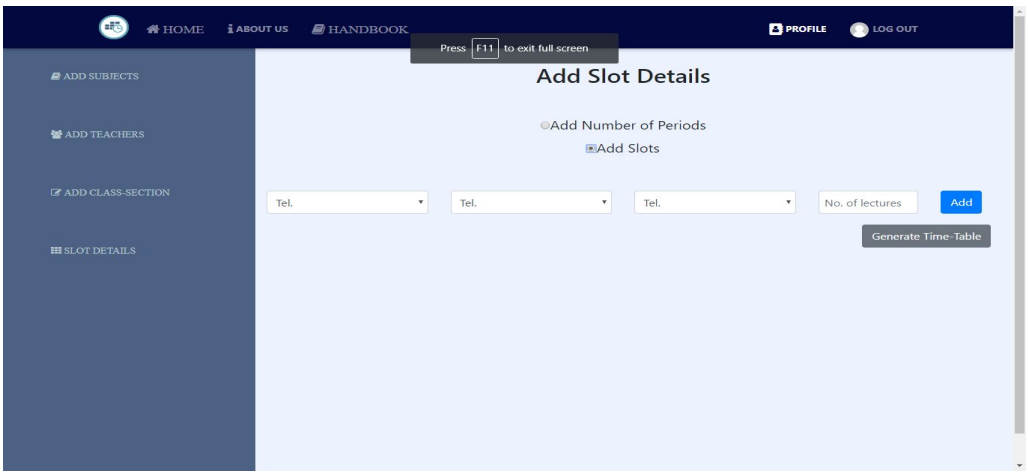


4.4.8 Delete Slots

On the Add Slots page, you can view the slot details added and on the right of every slot, there is a delete button. Click on the button and that slot would be deleted.

4.4.9 Generate TimeTable

After entering all the relevant slot details, the user can click on the Generate TimeTable button present on the bottom right of the add slots page.



If the application is taking a long time, i.e, more than 3 mins for generating an output, then the user should refresh the page. By doing so, the chances of getting a valid time-table increases as all the slots are initially alloted randomly.

5. Future Enhancements

In the future, more functionality can be added to shift it from school level to college level where backlogs will also be considered.

6. Glossary

1. **Heuristic**: Some problems are hard and we may not be able to get an acceptable solution in an acceptable time. A heuristic is a technique designed for solving such problems more quickly or for finding an approximate solution when classic methods fail to find an exact solution. This is achieved by trading optimality, completeness, accuracy for speed.

2. **Optimal solution:** An optimal solution is a feasible solution where the objective function reaches its maximum (or minimum) value – for example, the

most profit or the least cost. A globally optimal solution is one where there are no other feasible solutions with better objective function values.

3. **Constraint-based programming**: The constraint programming approach is to search for a solution in which a large number of constraints are satisfied at the same time. The relation between variables is stated in the form of constraints.

4. **Hard Constraints:** Hard constraints are those which we definitely want to be true. These might relate to the successful assembly of a mechanism.