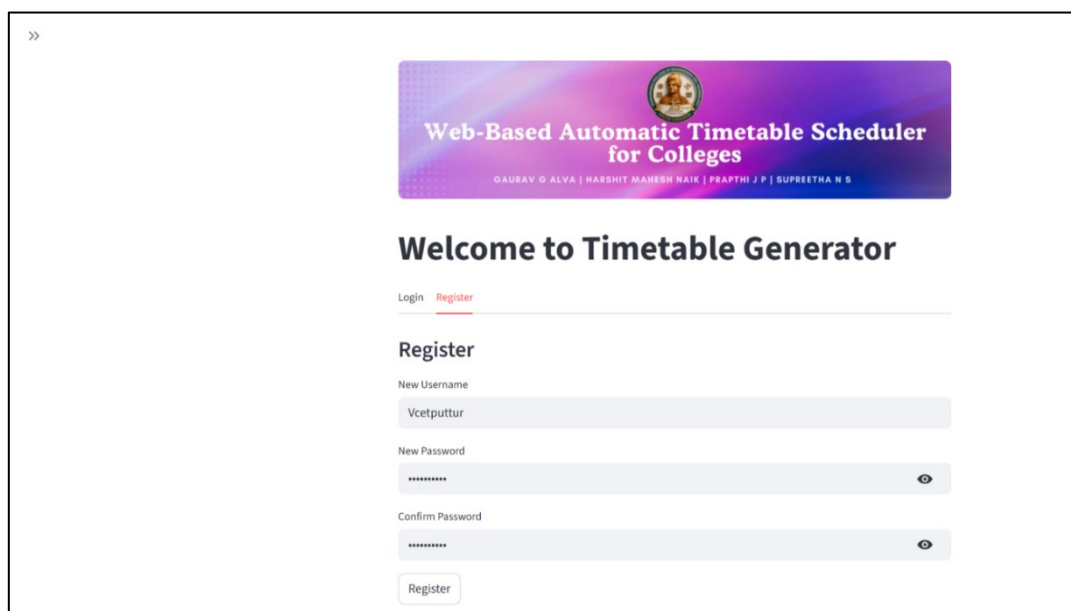## CHAPTER 7

# EXPERIMENTAL RESULTS AND SCREENSHOTS

7.1   Introduction

The Web-Based Automatic Timetable Scheduler for Colleges was experimentally evaluated to validate its performance, accuracy, and operational reliability. The experimental phase involved executing the system with institutional data to verify its capability to automatically generate optimized, conflict free timetables while satisfying all defined academic constraints. Screenshots captured during execution illustrate the complete workflow of the system, including data entry, faculty-course mapping, timetable generation, and final result visualization. These experimental outcomes highlight the effectiveness of the Genetic Algorithm in resolving scheduling complexities and demonstrate the seamless integration between the algorithmic logic and the Streamlit based interface. Overall, the results confirm that the developed system performs efficiently, ensuring usability, accuracy, and scalability in real world academic environments.

## 7.2   Result and Screenshots

Figure 7.1: User Registration Page

The user registration page of the Web-Based Automatic Timetable Scheduler, as illustrated in Figure 7.1, serves as the entry point for users to register, login and begin interacting with the system.
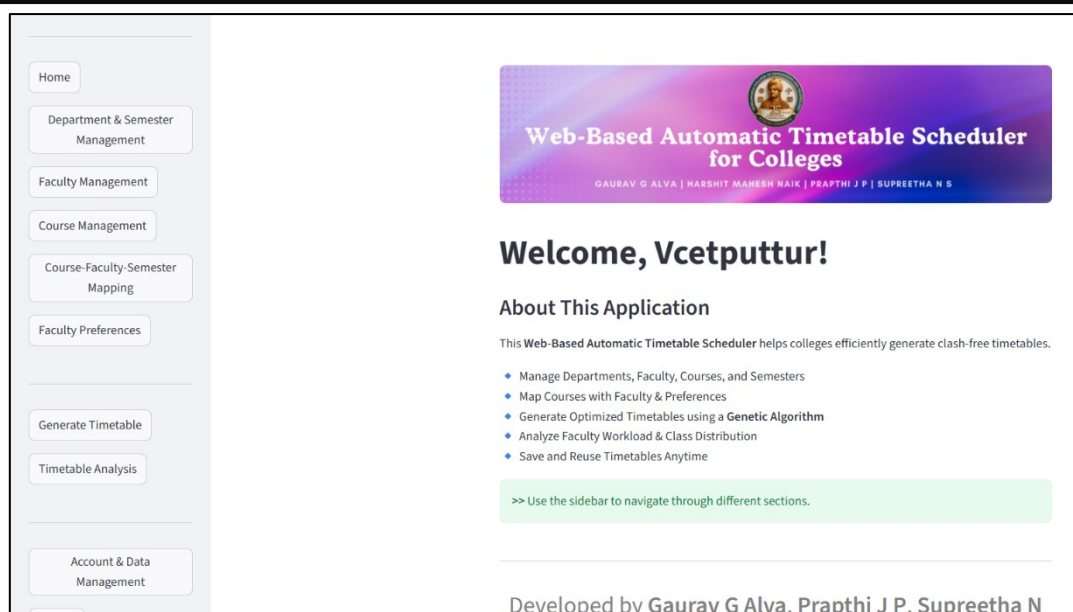
Figure 7.2: User Welcome Page

An overview of the application is shown in Figure 7.2, outlines its core functionalities such as faculty and course management, timetable generation, and analysis. A sidebar is displayed on the left to facilitate easy navigation across different modules.
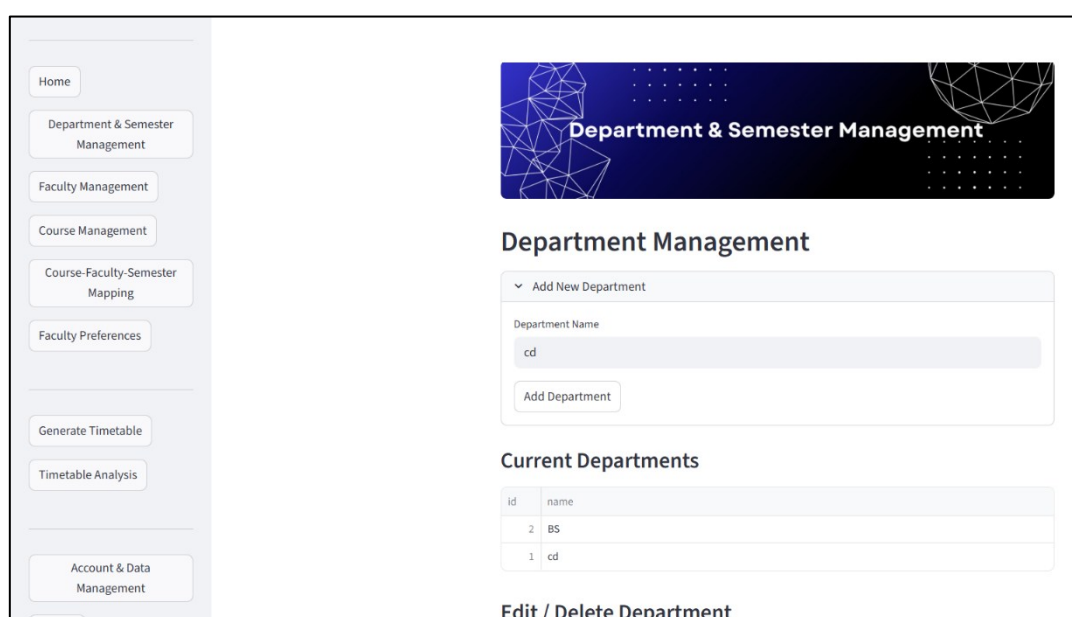

Figure 7.3: Department and Semester Management Page

The Department and Semester Management Page, as shown in Figure 7.3, displays options for adding, viewing, and modifying department and semester details. The interface includes a structured input field for creating new departments and a tabular section for managing existing entries, ensuring organized handling of academic departments.
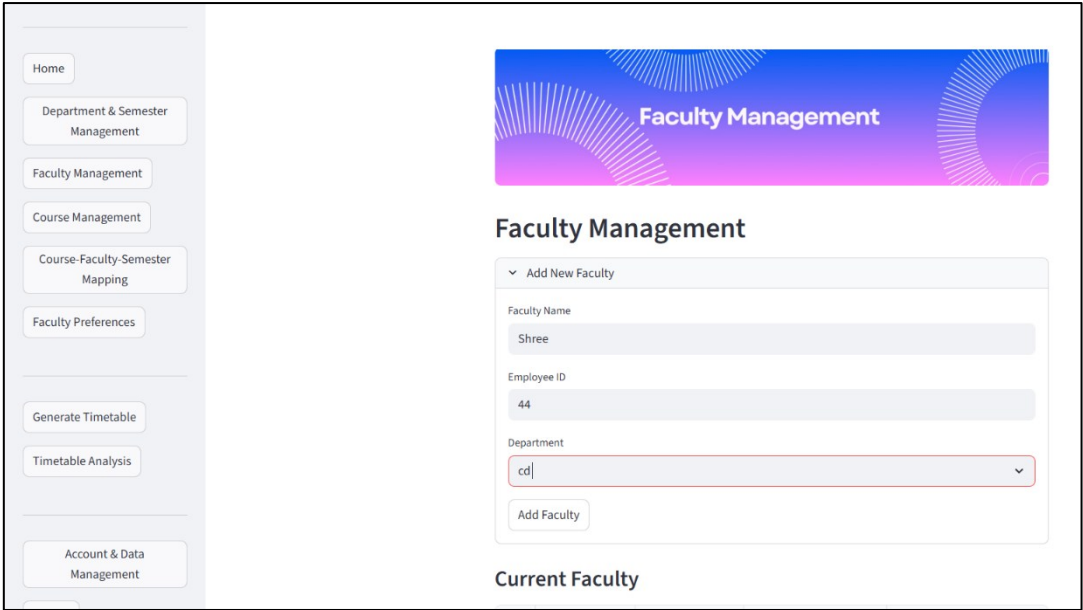
Figure 7.4: Faculty Management Page

The faculty management page allows users to add new faculty details such as name, employee ID, and department as shown in Figure 7.4. It also provides a table to view and manage existing records, ensuring systematic maintenance of faculty information.
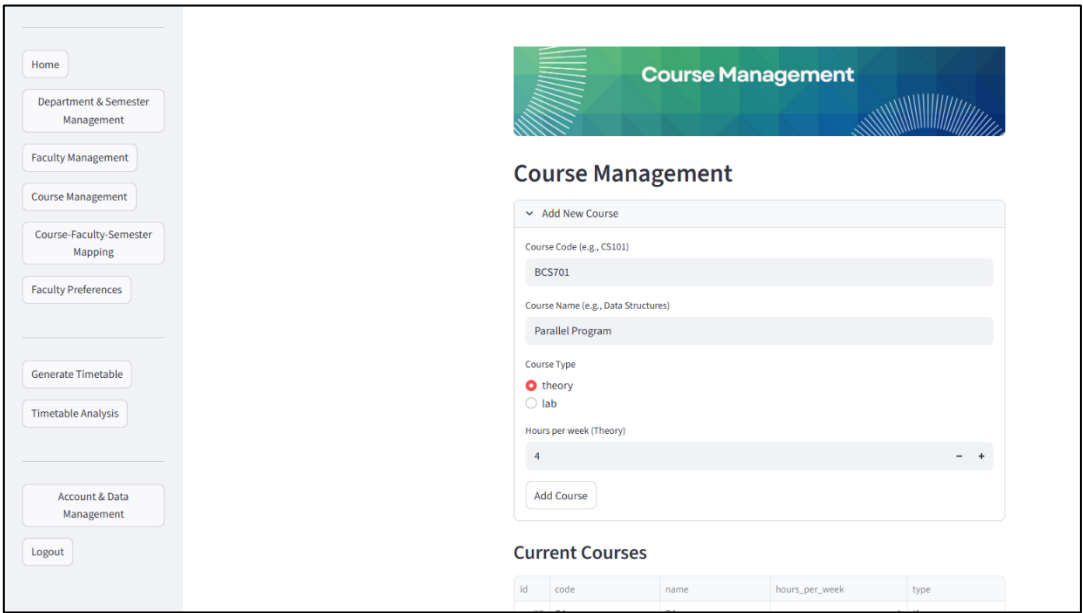
Figure 7.5: Course Management Page

The Course Management page enables users to add and manage course details such as course code, name, type, and weekly hours as shown in Figure 7.5. The section provides structured input fields and a tabular view for maintaining accurate and organized course information.
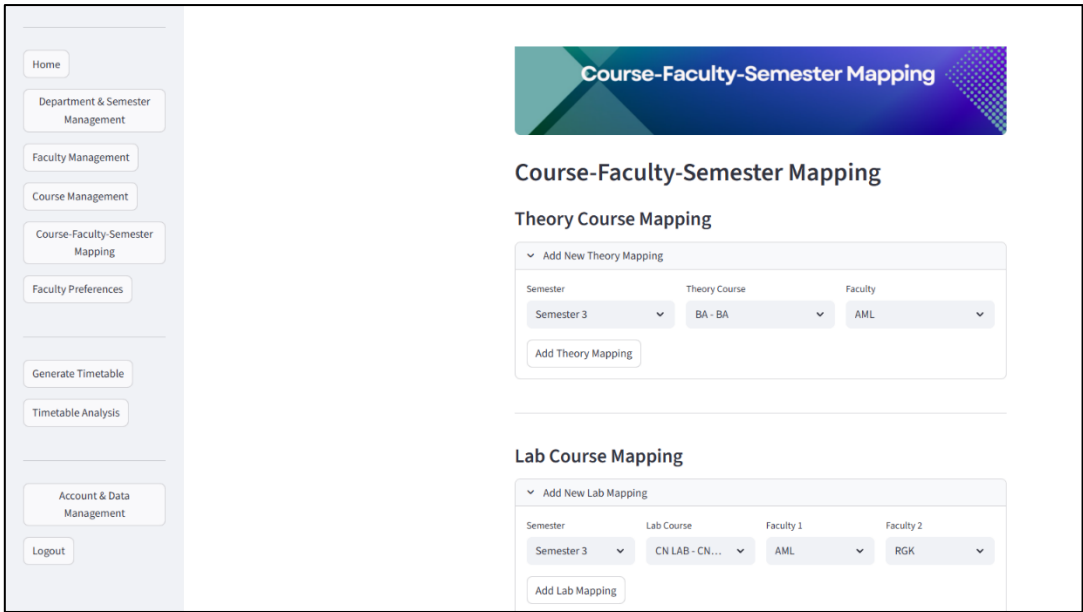
Figure 7.6: Course Faculty and Semester Mapping Page

The Course–Faculty–Semester Mapping page, shown in Figure 7.6, allows users to map faculty members to their respective theory and lab courses across semesters, ensuring accurate assignment of courses and faculty. It maintains proper linkage between academic courses, semesters, and faculty members in the scheduling process.
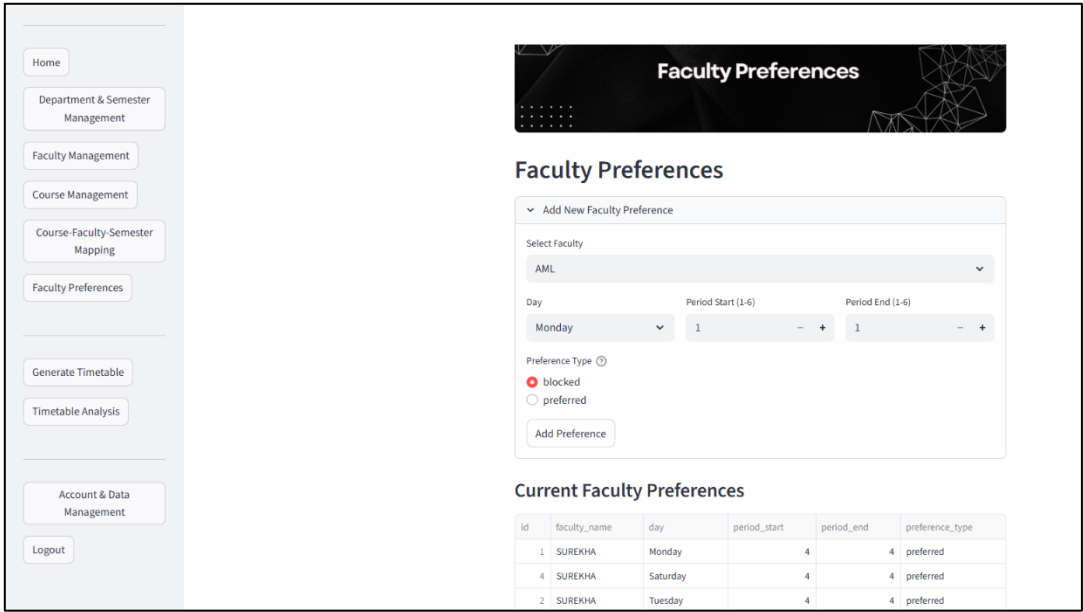

Figure 7.7: Faculty Preference Page

Faculty preferences indicating preferred and blocked time slots are illustrated in Figure 7.7. This information is utilized by the scheduling algorithm to ensure that timetable generation aligns with individual faculty availability and institutional constraints.

Figure 7.8: Timetable Generation and Display Page

Figure 7.9: Generated Timetable

The configuration and execution of the scheduling algorithm are shown in Figure 7.8, where parameters such as population size, number of generations, mutation rate, and crossover rate are adjusted before generating the timetable. The corresponding results are illustrated in Figure 7.9, displaying the finalized timetables for different semesters. These results confirm that the scheduler successfully produces conflict-free timetables while maintaining balanced faculty and course allocations.
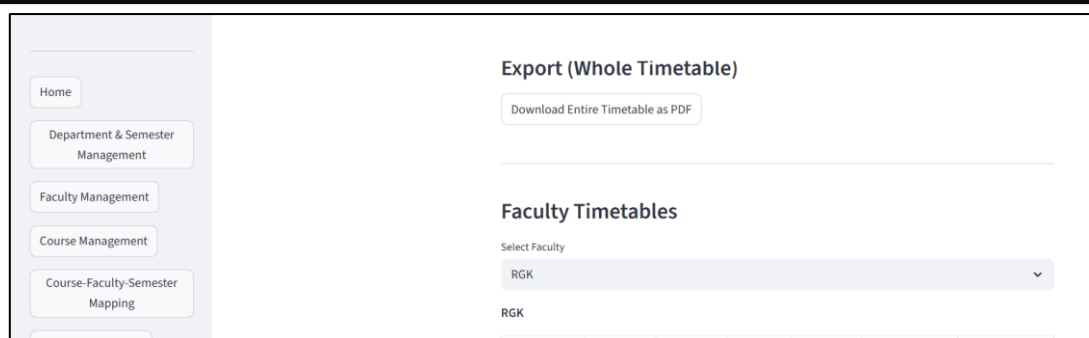
Figure 7.10: Export Timetable & Faculty Timetable

Figure 7.11: Downloaded Timetable

Figure 7.12: Downloaded Faculty Timetable

The timetable represents the final phase of the scheduling process. The export functionality allows users to download the generated timetables in PDF format as shown in Figure 7.10, for record keeping and academic use. The downloaded timetable as shown in Figure 7.11, displays the finalized schedule for each semester, organized systematically by day, slot, and course allocation. In contrast, the faculty specific timetable shown in Figure 7.12 presents individual schedules, detailing sessions assigned to each faculty across the week.
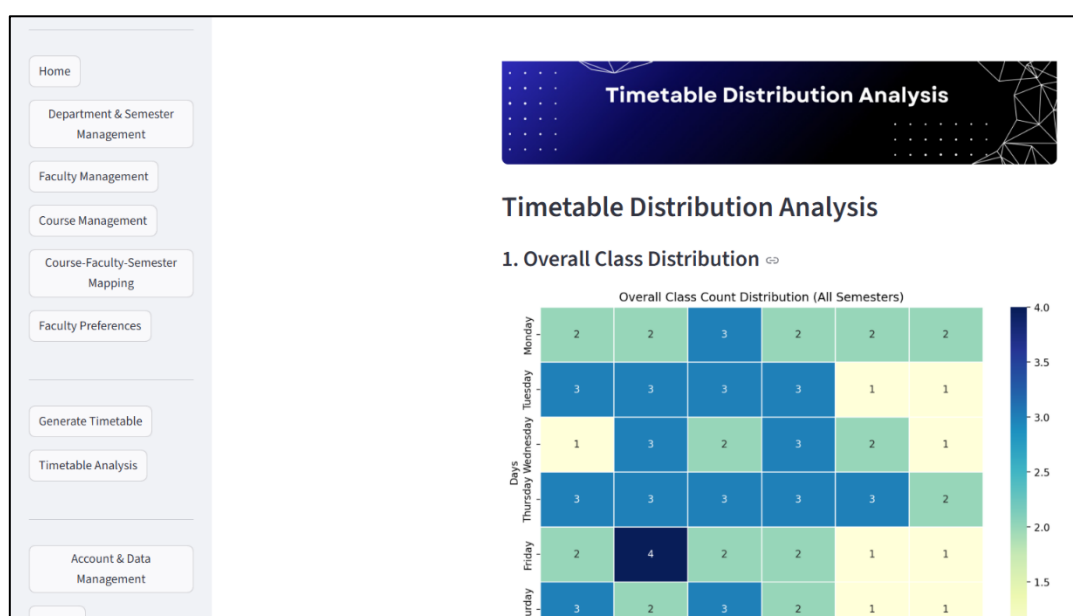
Figure 7.13: Timetable Analysis

The Timetable Analysis page visualizes the overall class count distribution across all semesters as illustrated in Figure 7.13 along with class distribution per semester. The graphical heatmap representation aids in understanding faculty workload balance, peak academic hours, and slot utilization efficiency.