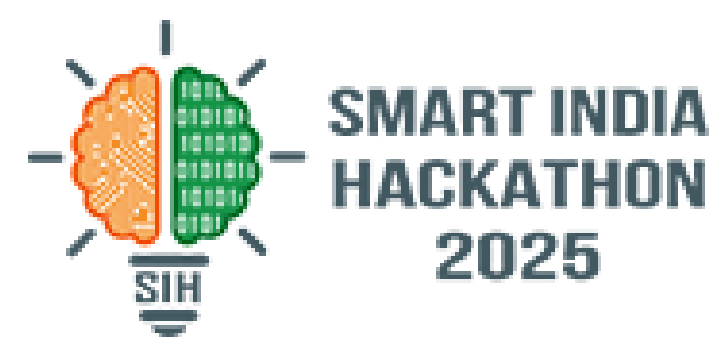


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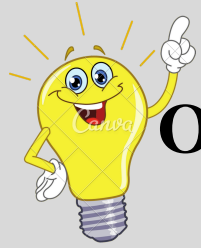


TITLE PAGE

- **Problem Statement ID: 25028**
- **Problem Statement Title: Smart Classroom & Timetable Scheduler**
- **Theme: Smart Education**
- **PS Category: Software**
- **Team Name (Registered on Portal): Smartcoders**



Idea Title : Smart Classroom & Timetable Scheduler



Our Idea

- Smart Classroom + Timetable Scheduler (Web & Mobile).
- Auto clash-free timetables with real-time updates.



How It Works

- Admin enters data → AI generates timetable.
- Auto-reschedule & notify if teacher/classroom unavailable.
- Smart features → attendance, alerts, resource sharing.



Why It Solves the Problem

- Saves time, avoids errors & clashes.
- Keeps students & teachers updated.



What's Unique

- AI-based scheduling & rescheduling.
- Combines timetable + classroom management.
- Future-ready with IoT integration.

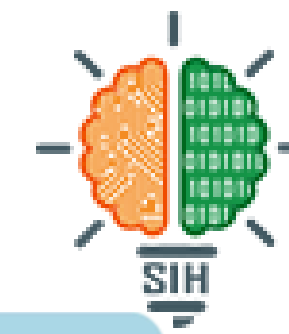
Admin Inputs Data
(Teachers, Subjects, Classrooms)

AI Generates Timetable

Clash-Free Timetable

Auto-Reschedule & Notify

Smart Features
(Attendance, Alerts, Resources)

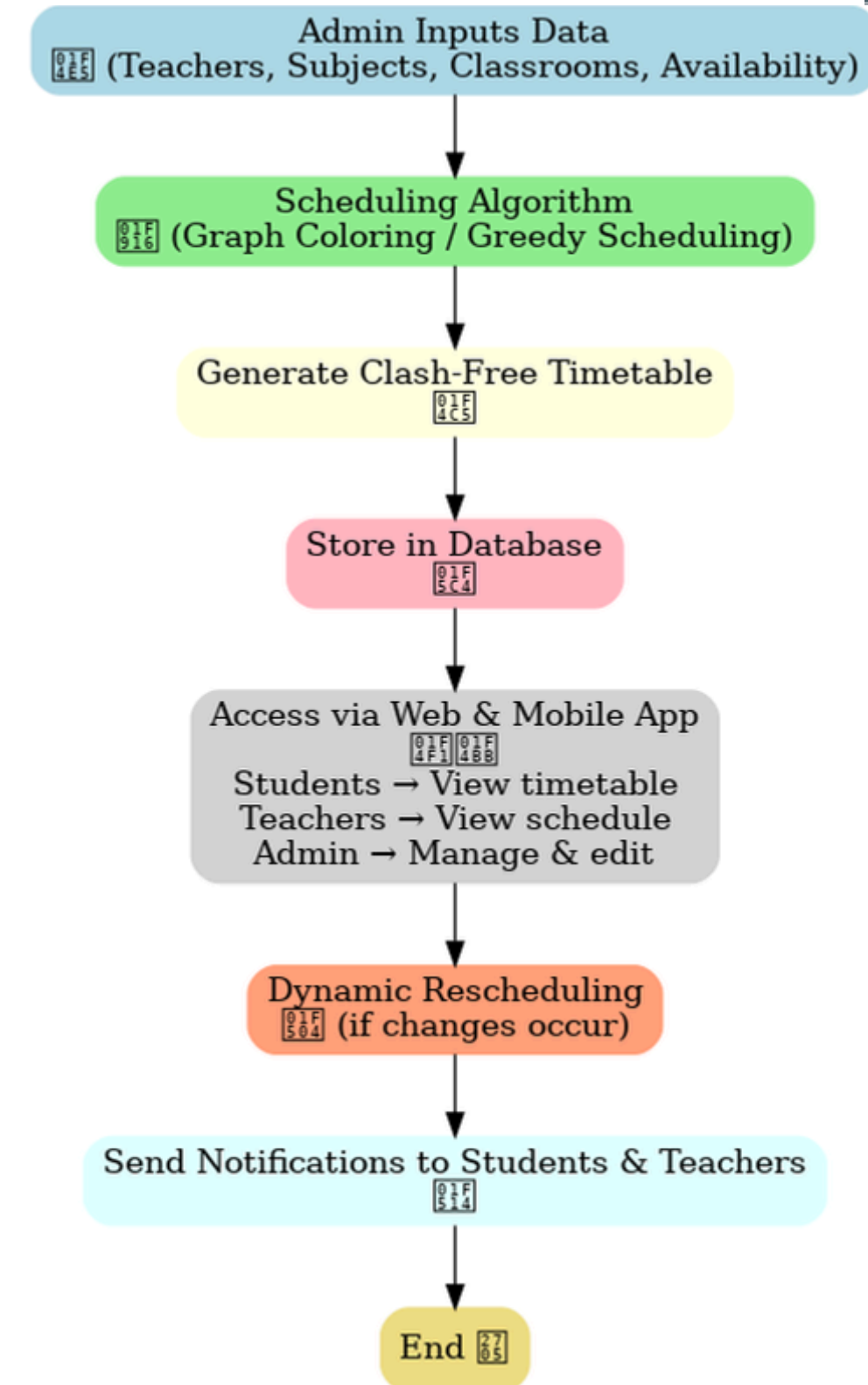


Technologies Used

- Frontend : React / Flutter
- Backend : Node.js
- Database : MySQL
- AI Algorithm : Graph Coloring / Greedy Scheduling (for clash-free timetable generation).
- (Optional) IoT → QR/Face Attendance, Smart Sensors

Methodology

- Input → Subjects, teachers, classrooms.
- AI Engine → Generates clash-free timetable.
- Output → Web & Mobile access for students/teachers.
- Dynamic Rescheduling → Auto-update & notify on changes.
- Smart Features → Attendance, alerts, resource sharing.



Feasibility Analysis

- Automates timetable creation → saves time
- Minimizes clashes & human errors
- Real-time updates via Web & Mobile

Potential Challenges & Risks:

- Conflicting teacher/classroom availability
- Performance issues with large data
- User adoption & training difficulties

Strategies to Overcome Challenges:

- Apply robust scheduling algorithms (Graph Coloring / Greedy)
- Optimize database & app performance
- Provide intuitive UI & user training

Feasibility Analysis

Feasibility Analysis

- ⌚ Automates timetable → saves time
- ⚡ Minimizes clashes & errors
- 📱 Real-time updates via Web & Mobile

Challenges & Risks

- ⚠ Conflicting teacher/classroom availability
- ⚠ Performance issues with large data
- ⚠ User adoption & training difficulties

Strategies to Overcome

- 💡 Robust scheduling algorithms
- 👤 Optimize database & app performance
- 👤 Intuitive UI & training

Potential Impact on Target Audience:

 Students → Easy access to timetable & updates, reduces confusion

 Teachers → Simplifies schedule management, reduces workload

 Admin → Efficient timetable creation & management

Benefits of the Solution:

 Social: Improves communication & organization in educational institutions

 Economic: Saves time and resources in scheduling

 Environmental: Reduces paper usage with digital timetables

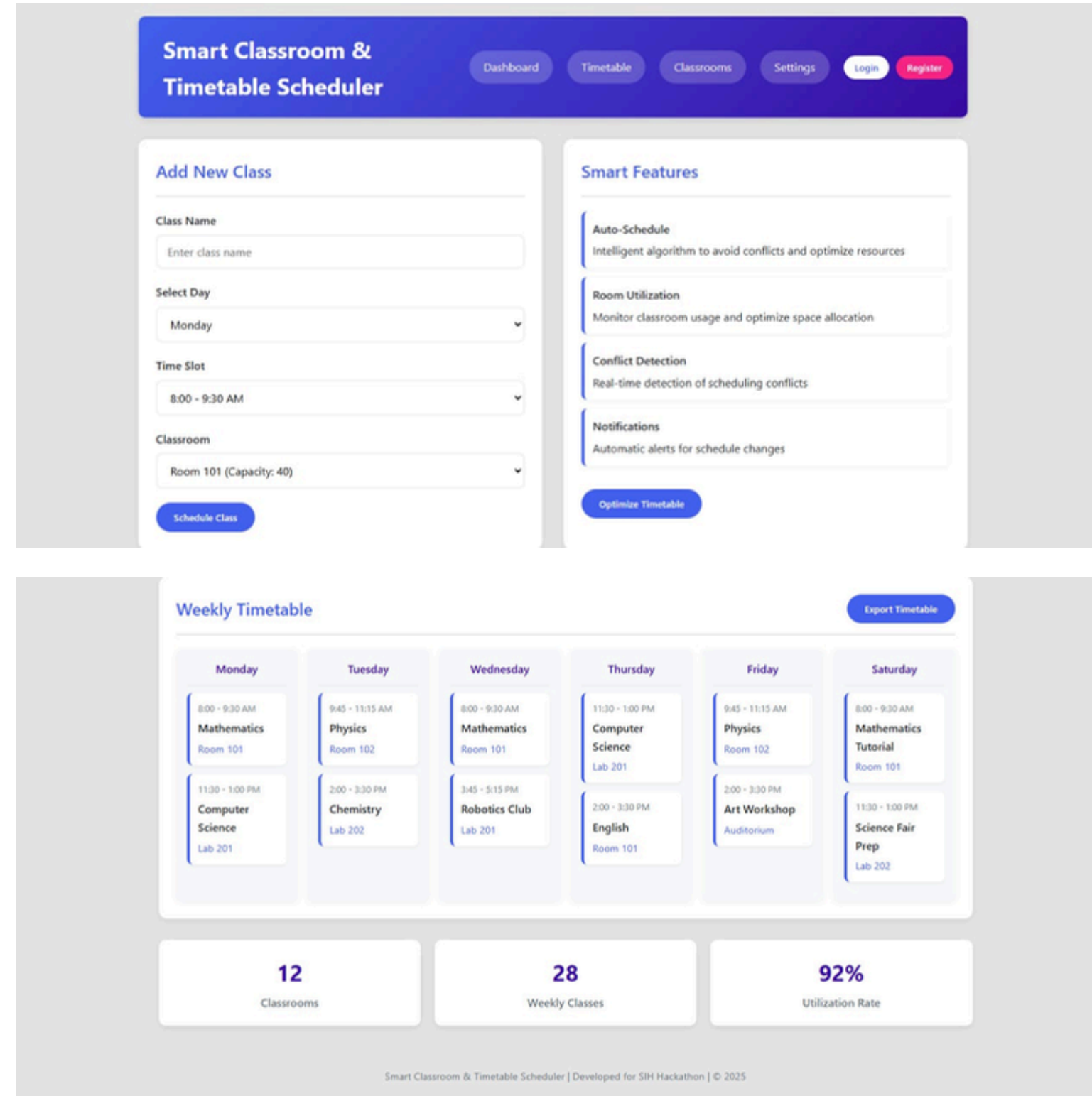


References & Research:

Academic papers on AI-based timetable scheduling

Research on Graph Coloring & Greedy algorithms

Smart Education platforms & case studies



The screenshot displays the 'Smart Classroom & Timetable Scheduler' web application. The interface is divided into two main sections: 'Add New Class' and 'Smart Features'.

Add New Class Section:

- Class Name:** A text input field with the placeholder 'Enter class name'.
- Select Day:** A dropdown menu currently showing 'Monday'.
- Time Slot:** A dropdown menu currently showing '8:00 - 9:30 AM'.
- Classroom:** A dropdown menu currently showing 'Room 101 (Capacity: 40)'.
- Schedule Class:** A blue button to submit the new class information.

Smart Features Section:

- Auto-Schedule:** Intelligent algorithm to avoid conflicts and optimize resources.
- Room Utilization:** Monitor classroom usage and optimize space allocation.
- Conflict Detection:** Real-time detection of scheduling conflicts.
- Notifications:** Automatic alerts for schedule changes.
- Optimize Timetable:** A blue button to optimize the current schedule.

Weekly Timetable Section:

This section shows a grid of classes for each day of the week. A blue button 'Export Timetable' is located at the top right of this section.

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8:00 - 9:30 AM Mathematics Room 101	9:45 - 11:15 AM Physics Room 102	8:00 - 9:30 AM Mathematics Room 101	11:30 - 1:00 PM Computer Science Lab 201	9:45 - 11:15 AM Physics Room 102	8:00 - 9:30 AM Mathematics Tutorial Room 101
11:30 - 1:00 PM Computer Science Lab 201	2:00 - 3:30 PM Chemistry Lab 202	3:45 - 5:15 PM Robotics Club Lab 201	2:00 - 3:30 PM English Room 101	2:00 - 3:30 PM Art Workshop Auditorium	11:30 - 1:00 PM Science Fair Prep Lab 202

Summary Cards:

- 12** Classrooms
- 28** Weekly Classes
- 92%** Utilization Rate

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