



TIMETABLE GENERATOR

COMPUTER ENGINEERING

194053

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Introduction

Creating class timetables is a time-consuming and error-prone task for academic institutions, typically done manually. However, this project aims to streamline and automate the process by minimizing manual intervention. The goal is to automatically schedule courses timetable based on preferences, efficiently allocating resources and handling conflicts. Users can specify desired time slots or constraints, and the app will prioritize these preferences. By incorporating intelligent features, the project aims to optimize timetable creation, reduce the burden on human schedulers, save time, and enhance scheduling efficiency in academic institutions.

Goals

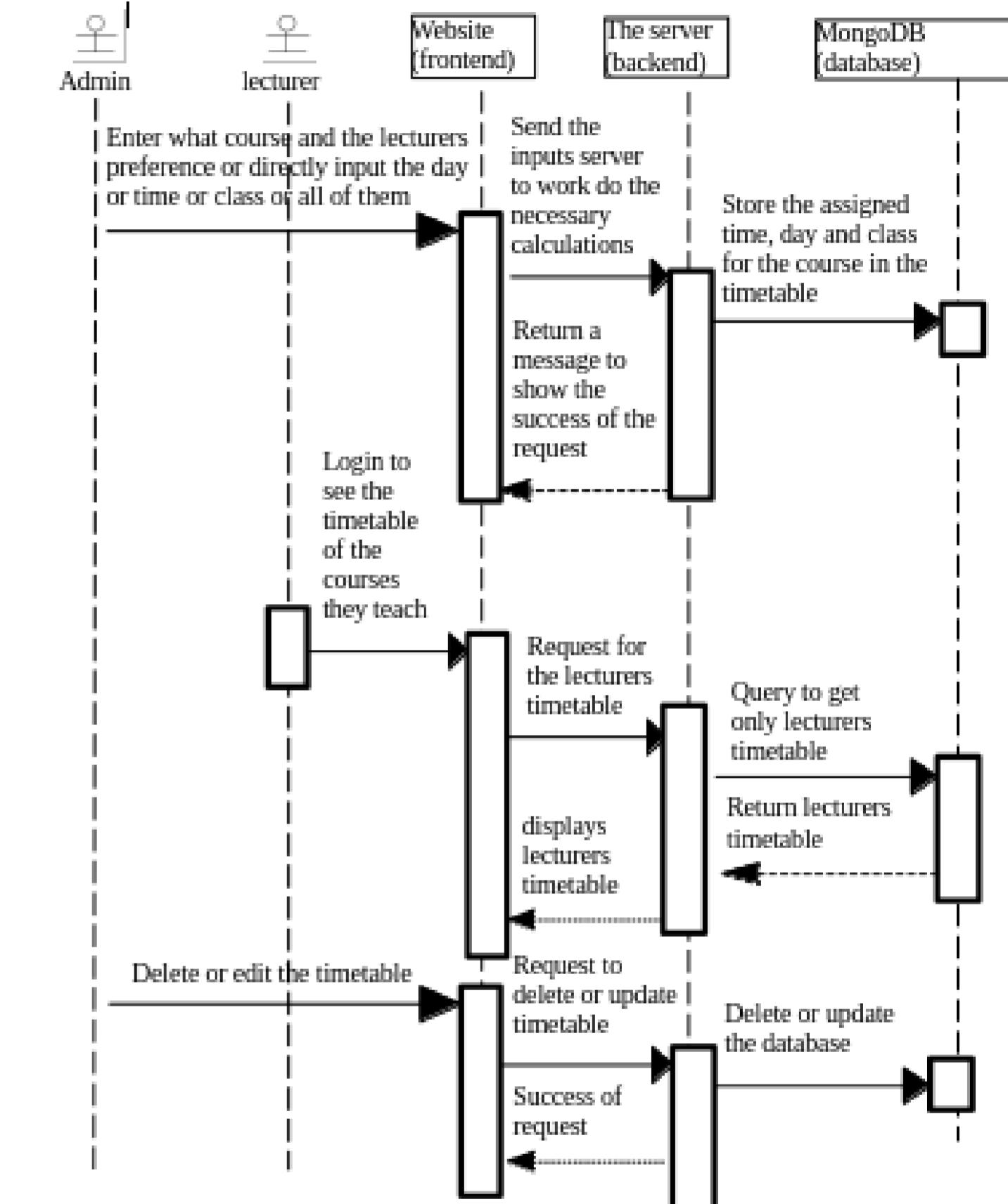
- Make sure there are no overlapping classes for an instructor.
- No courses in a course schedule are overlapped.
- Make sure a classroom does not have overlapping courses at the same time.
- Make sure the class is big enough for the number of students taking that class
- Making the insertion and deletion to and from the database done by only the admin.
- Ensuring that when an insertion or a deletion to/from the database is being done, another insertion/deletion will wait.
- Making the users (admin and instructor) able to see the timetables created.
- Able to handles not just the normal flow of a department courses but also in cases of carryover courses.
- Able to compare the timetables of selected students and students in a course.

Methodology

The database design is a carefully compressed version of a comprehensive university database where selected tables and components are essential for developing a timetable for the university. The schemas/entities include classroom, instructor, student, department, course schedule, course, admin, and the timetable. The course schedule includes regular departmental courses for a year and semester, along with special-courses for carry-over courses.

Instructors can compare students' timetables within a course and access their own timetable along with classrooms, course details, and student information. Administrators have all instructor functionalities and additional privileges to manage student records, course listings, instructor assignments, classroom allocations, course schedules, and the timetables. They can assign courses to students, control department eligibility, manage special courses, and view all timetables. Tabu search systematically explores all available time slots to find a suitable placement for a given course. It checks if the course can fit into the first available time slot and tracks visited slots in a tabu list to avoid revisiting them. In this project's modified version, additional conditions guide time slot selection to prevent conflicts. The algorithm considers overlapping courses for both the instructor and enrolled students, rejecting conflicting slots. It examines course schedules, special-course requirements, and classroom availability. By considering all relevant factors, the algorithm generates a comprehensive and conflict-free timetable solution, ensuring no overlapping timetables occur.

Sequence Diagram



UI Of The Project

The screenshot shows the application's main interface. On the left, there are several dropdown menus and input fields for selecting courses and instructors. A summary table on the right shows a student's schedule for the week, listing subjects like Busn102 Accounting, Compl101 Computer Programming, EET101 Digital Signal, and Compl100 Pseudo Code across Monday through Friday.

4 James Azuogu				
Monday	Tuesday	Wednesday	Thursday	Friday
	Busn102 Accounting -- AS100		Compl101 Computer Programming -- AS108	
9:00				
10:00	Busn102 Accounting -- AS100		Compl101 Computer Programming -- AS108	
11:00	Busn102 Accounting -- AS100		Compl101 Computer Programming -- AS108	
12:00				
13:00				
14:00	EET101 Digital Signal -- HK103		Compl100 Pseudo Code -- AS108	
15:00	EET101 Digital Signal -- HK103		Compl100 Pseudo Code -- AS108	
16:00	EET101 Digital Signal -- HK103		Compl100 Pseudo Code -- AS108	
17:00				
18:00				
19:00				

friday 10:00
• Compl101 Computer Programming
AS108 -- 9:00-11:00
ikechukwu delight

Monday	Tuesday	Wednesday	Thursday	Friday
9:00	4 student(s) have a class			
10:00	4 student(s) have a class		1 student(s) have a class	
11:00	4 student(s) have a class		1 student(s) have a class	
12:00			1 student(s) have a class	
13:00				
14:00	3 student(s) have a class	3 student(s) have a class		
15:00	3 student(s) have a class	3 student(s) have a class		
16:00	3 student(s) have a class	3 student(s) have a class		
17:00				
18:00				
19:00				

Students having class on thursday at 11:00
• 5 james kennedy -- EET101 Digital Image

Conclusion

By introducing automation and leveraging an app for timetable generation, this project aims to streamline the labour-intensive task of creating class timetables. Through systematic scheduling, consideration of preferences, and conflict resolution, the project seeks to enhance efficiency, reduce errors, and alleviate the burden on human schedulers in academic institutions.