**Project Proposal**: Dynamic Timetable Generator with Integrated Notification System via WhatsApp Chatbot

Project Title: Dynamic Timetable Generator and Notification System

# Project Overview:

In our final year project, we aim to develop a comprehensive "Dynamic Timetable Generator" that takes into consideration various constraints and preferences while ensuring an efficient and effective schedule for both staff and students. The system will be integrated with a chatbot, leveraging WhatsApp for seamless communication and notifications.

# Objectives:

1. **Timetable Generation**:

- Develop an algorithm to generate timetables considering constraints such as staff availability, subjects specialisation, health concerns, academic calendars, and recommended sessions per week.

2. **Classroom and Lab Allocation**:

- Ensure optimal allocation of classrooms and labs, with a focus on consecutive slots for lab and project hours.

3. **Notification System:**

- Implement a notification system through a WhatsApp chatbot for real-time communication.

- Notify teachers and students about timetable changes, substitutions, and free hours.

# Features:

1. **Staff Details:**

- Store and manage information about each staff member, including name, age, allocated batches, subject specialisation, and health status.

2. **Session Duration and Breaks:**

- Define session durations and break timings, ensuring adequate breaks for staff with health concerns.

3. **Academic Calendar Integration:**

- Incorporate academic calendars from both the university and college to align timetables with academic schedules.

4. **Recommended Sessions:**

- Adhere to the recommended number of sessions per week set by the university.

# Technical Stack:

- **Programming Languages:** Python (for backend), JavaScript (for chatbot integration)

- **Database:** MySQL or PostgreSQL

- **Web Framework**: Flask or Django

- **Chatbot Framework:** Dialogflow or Microsoft Bot Framework

- **WhatsApp API:** WhatsApp Business API or a third-party service with WhatsApp integration

# Methodology:

1. **Requirements Gathering:**

- Engage with university officials, teachers, and students to collect detailed requirements.

- Identify specific constraints and preferences for timetable generation.

2. **System Design:**

- Design the overall system architecture, including the database schema and chatbot interfaces.

3. **Implementation:**

- Develop the timetable generation algorithm, incorporating constraints and preferences.

- Implement the chatbot for WhatsApp integration and the notification system.

4. **Testing:**

- Conduct rigorous testing to ensure the accuracy of timetable generation and the effectiveness of the notification system.

5. **Deployment:**

- Deploy the system on a secure server, ready for real-world usage.

6. **User Training:**

- Provide training sessions for staff and students on using the chatbot and understanding the new timetable system.

**Challenges and Mitigation:**

- **Complex Constraints:**

- Regular stakeholder feedback and iterative development will help address evolving constraints.

- **Real-time Integration:**

- Rigorous testing and continuous monitoring will be conducted to ensure real-time communication through the chatbot.

# Conclusion:

This project aims to revolutionize timetable management, ensuring the well-being of staff and providing students with an organized and efficient schedule. The integration with WhatsApp ensures quick and accessible communication, enhancing the overall user experience. The successful implementation of this project will contribute significantly to the optimization of academic scheduling processes.