Documentation

Task: Automated Task Reminder & Tracking Application

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1.Objective: -

1. To develop an automated system that helps users track and manage their daily tasks efficiently.
2. To provide timely reminders for upcoming tasks and deadlines.
3. To enable users to update task status, add new tasks, and view completed tasks easily.
4. To create a user-friendly interface for seamless task management.

2. Steps Taken: -

1. **Project Setup & Configuration:**
   A Spring Boot project was created and configured with required dependencies such as Spring Web, Spring Data JPA, Thymeleaf, and MySQL Connector. Application properties were set to connect the project with the MySQL database**.**

2. **Database Design:**
   MySQL database tables were designed for users and tasks. Each task was linked to a specific user to ensure that every logged-in user can view and manage only their own tasks. Fields such as title, description, due date, status, priority, created time, and completed time were included.

3. **Backend Development:**
   Backend logic was implemented using Spring Boot with layered architecture (Controller, Service, Repository). CRUD operations for tasks were developed, including add, edit, delete, view, and mark as completed. Task status and priority handling were implemented using enums for better structure.

4. **User Authentication & Session Handling:**
   Login and registration functionality was implemented to authenticate users. Session management was used to maintain logged-in user details and to restrict task access so that each user can access only their own tasks**.**

5. **Frontend Development Using Thymeleaf:**
   Thymeleaf templates were created for landing page, registration, login, and task dashboard. Dynamic data such as task lists, task counts, and messages were rendered from the backend. Header and footer were implemented using Thymeleaf fragments to maintain consistency**.**

6. **Dashboard Features Implementation:**
   The dashboard was enhanced with summary cards for pending, in-progress, and completed

tasks. Search functionality, filtering by status and priority, pagination, and task cards with action buttons were implemented for efficient task management.

7. **Calendar View Integration:**
   An interactive calendar feature was added using JavaScript, where tasks are displayed based on their due dates. Users can navigate between months and visually track their task deadlines.

8. **UI/UX Styling:**
   CSS was used to design a clean, modern, and responsive interface. Soft colors, rounded elements, spacing, and popup notifications were added to improve user experience**.**

9. **Testing & Debugging:**
   All application features were tested, including user registration, login, task creation, editing, completion, deletion, search, filtering, and pagination. Bugs were identified and fixed to ensure smooth and reliable functionality.

3.Challeneges Encountered: -

1. Connecting the Spring Boot application with the MySQL database was challenging initially, especially resolving errors related to database configuration, entity mapping, and table creation.
2. Ensuring that tasks were displayed only for the logged-in user was difficult at first and required proper handling of session data and filtering tasks based on the user.
3. Fixing issues in CRUD operations, such as tasks not updating correctly after editing or status changes not reflecting immediately on the dashboard, required repeated testing and debugging.
4. Integrating Thymeleaf templates with backend data was challenging, particularly while passing dynamic values like task lists, task counts, and success or error messages without causing template errors.
5. Designing a clean, professional, and responsive frontend using CSS while maintaining usability and consistency across all pages required multiple adjustments and refinements.

4. Conclusion: -

The Automated Task Reminder & Tracking Application was successfully developed using Spring Boot, MySQL, and Thymeleaf to help users efficiently manage and track their daily tasks. The application includes features such as user authentication, task creation, updating, deletion, task status tracking, dashboard summaries, calendar-based task visualization, and email notifications for task reminders, ensuring users are informed about upcoming deadlines. Session management ensures that each user can access only their own tasks, maintaining data security and privacy. The clean, responsive, and user-friendly interface enhances overall usability. This project provided practical exposure to full-stack web application development, including backend logic, database integration, frontend design, session handling, and testing. Overall, the system demonstrates an effective, reliable, and automated solution for task management.