IT Automation Software Engineer Technical Task

Overview:

It is required to build a **Task Management and Report Subscription System** that allows users to manage tasks, subscribe to automated reports, and receive scheduled email summaries based on a chosen frequency. The system must include authentication and authorization to ensure only authenticated users can access specific endpoints.

Requirements

Core Features

1. **User Authentication**

    o Implement **Sign Up** and **Sign In** endpoints:

        ▪ **Sign Up**:

            ▪ Takes username, email, and password.

            ▪ Stores the hashed password securely in the database.

            ▪ Prevent duplicate sign-ups using the same email.

- **Sign In**:
  - Accepts email and password.
  - Returns a JSON Web Token (JWT) or equivalent for session handling.
- Add authentication middleware to protect all APIs except **Sign Up** and **Sign In**.

---

2. **Task Management API**

- **Create a Task**:
  - Fields: title, description, start_date, due_date, completion_date and status.
  - Only authenticated users can create tasks, and tasks are owned by the user who created them.

- **Retrieve Tasks**:
  - Fetch tasks with optional filters:
    - By status (Pending, Completed, Overdue).
    - By date range.
    - Restricted to tasks owned by the authenticated user.

- **Update a Task**:
  - Modify the task attributes(title, description ..etc).
  - Only the task owner can update a task.

- Note: you can add or remove any entity attributes. However, you should maintain the task main functionalities.

- o **Delete a Task**:
    - Remove a task by its ID.
    - Only the task owner can delete a task.
- o **Batch Delete**:
    - Delete Tasks in a certain period.
- o **Restore Tasks:**
    - Restore last Deleted Task.

---

3. **Subscription API**

- o **Subscribe to Reports**:
    - This feature allows user to get his tasks that have an end date in the last day/week/month periodically.
    - Accepts:
        - start_date: Date the report generation starts.
        - frequency: One of daily, weekly, monthly.
        - report_time: Time of the day (hour only, no minutes) for report generation.
    - Sends an email to the user each selected period containing the tasks with end_date in the selected period.

- o **Unsubscribe**:
  - Deletes the subscription for the authenticated user.
- o **Validation Rules**:
  - Ensure start_date contains valid hours (00 to 23) and no minutes **ex: 1:12:2024 12:00:00**.

---

4. **Report Generation**

- o Automatically generate and send reports based on the subscription frequency:
  - **Daily**: Include tasks with end date in the last 24 hours.
  - **Weekly**: Include tasks with end date in the last 7 days.
  - **Monthly**: Include tasks with end date in the last 30 days.
- o The report should:
  - Include a list of tasks with their statuses (Pending, Completed, Overdue).
  - Be formatted as an HTML email for easy readability.

5. **Bonus**:

- o Dockerized setup with Dockerfile and docker-compose.yml.

Requirements for Implementation

Backend Framework

- Use any backend framework preferably Python Backend framework:

Database

- Use any relational database:

- Add/Modify any fields/tables to complete the task

Email Service

- You Don't need to use any paid services.

- It is acceptable if the emails end up in the junk folder.

Deliverables

1. **GitHub Repository**:

   o Backend code.

   o API documentation (e.g., via Swagger or Postman collection).

   o A README.md with:

     ▪ Setup instructions and how to run the code.

     ▪ Example API requests and responses.

Evaluation Criteria

1. **Functionality**:
   - Are the APIs working as expected?
   - Does the report generation respect the frequency?

2. **Code Quality**:
   - Is the code modular, clean, and well-documented?

3. **Submissions date:**
   - While completing the task is important, submitting it before the deadline, even if it's not fully finished, takes precedence over submitting it fully completed after the deadline.

Technical Inquiries:

Please feel free to reach us out for further inquiries.

Fatma Essam
fatma.essam@vodafone.com.eg
01099610500

Omar Taher
omar.taher@vodafone.com.eg
01143363898