Assignment: Build a Simple API with JWT Authentication and RBAC

Task Overview

Create a RESTful API that implements user authentication with JWT (JSON Web Token) and Role-Based Access Control (RBAC). The API should manage users with different roles and restrict access to certain endpoints based on the user's role.

Required Tech Stack: FastAPI and Postgresql (sqlmodel - [Link](#))

Requirements:

1. User Registration and Login:

- Users should be able to register with a username and password.
- Passwords should be hashed using a secure algorithm (e.g., bcrypt).
- Users can log in and receive a JWT token upon successful authentication.

2. JWT-based Authorization:

- The API should use JWT tokens for authenticating users.
- Upon login, the JWT should include user information (e.g., user ID and role).
- The token should be validated in subsequent API requests for authentication.

3. Role-Based Access Control (RBAC):

- Implement at least two roles: `admin` and `user`.
- Only users with the `admin` role should be able to access certain protected endpoints (e.g., creating, updating, or deleting resources).
- Users with the `user` role should only be able to access read-only endpoints.

4. CRUD Operations for Resources:

- Implement basic CRUD operations for a sample resource (e.g., "projects").
- Ensure that:
  - `admin` users can create, update, delete, and view resources.
  - `user` role can only view resources.

5. Postgresql (Sqlmodel):

- Use Postgresql to store user information (e.g., username, password, role) and the resources (e.g., projects).
- Use Sqlmodel as the ORM (Object Relation Mapper) for interacting with Postgresql.

Example Endpoints:

1. **User Registration:**
   - POST /register
   - Body: { "username": "example", "password": "password123", "role": "user" }
2. **User Login:**
   - POST /login
   - Body: { "username": "example", "password": "password123" }
   - Response: { "access_token": "JWT_TOKEN" }
3. **Get Projects (for all users):**
   - GET /projects
   - (Requires JWT)
4. **Create Project (admin only):**
   - POST /projects
   - Body: { "name": "Project A", "description": "Description of project" }
   - (Requires JWT with admin role)

Submission:

Please upload your code to a public GitHub repository, ensuring that you include a README.md file with clear instructions on how to set up and run the project.

The README should cover
- installation steps
- dependencies
- video recording demonstrating the setup and usage of your project.
- any additional configurations needed for testing or deployment.

Once the repository is ready, kindly fill this form (https://forms.gle/ayGgXWHzfA3BF78k8) with the GitHub link for further review.