

Write up:

1. Entity Layer: The Entity Layer involves creating two entities: Vaccine Center and User. These entities will hold the necessary information about vaccination centers and citizens. The Vaccine Center entity will store details such as center ID, name, address, and city. The User entity will contain information like user ID, name, age, address, and vaccination status.
2. Repository Layer: The Repository Layer will handle all the database operations. It will provide methods to perform Create, Read, Update, and Delete (CRUD) operations on the Vaccine Center and User entities. This layer will interact directly with the MySQL database, ensuring data persistence and retrieval.
3. Service Layer: The Service Layer will act as a bridge between the Repository Layer and the Controller Layer. It will encapsulate the business logic of the application. This layer will handle tasks such as adding citizens to the database, retrieving citizen information, and mapping users to specific vaccination centers. It will demonstrate the principles of dependency injection and interface segregation, making the code modular and maintainable.
4. Controller Layer: The Controller Layer will expose a set of APIs that citizens can interact with. These APIs will provide easy access to the application's functionalities. Here are the APIs that will be available:
  - Add citizens to the database: This API will enable citizens to register for vaccination by providing their details such as name, age, address, and vaccination status.
  - Retrieve all citizens: This API will retrieve the information of all citizens stored in the database. It will help in tracking the vaccination status of all citizens in the country.
  - Retrieve a specific citizen: This API will allow users to search for a specific citizen by providing their unique identifier, such as user ID or name.
  - Retrieve all vaccination centers: This API will fetch information about all the vaccination centers in each city. It will assist citizens in finding nearby centers for their vaccinations.
  - Retrieve a specific vaccination center by ID: This API will retrieve details about a specific vaccination center based on its unique identifier, such as center ID.

- Retrieve a specific vaccination center and all its citizens in that city: This API will provide information about a particular vaccination center along with the citizens registered at that center. It will help citizens track their vaccination center and fellow citizens in the same location.

These layers and APIs will form the foundation of the application, enabling citizens to easily access vaccination centers, track their vaccination status, and ensure efficient management of data related to citizens and vaccination centers.