

## Mini Project 3: Vaccination Center

### Project objective:

Build an application to manage vaccination centers working on distributing vaccines to all citizens of India

### Background of the problem statement:

You have been hired by the Government of India as a Full Stack Developer, with the aim of creating an application prototype that would support the vaccination of all citizens of India.

The application would:

- Help citizens reach out to the centers for their vaccinations
- Track the vaccination status of all citizens in the country
- Track vaccination centers in each city
- Support the use of CRUD database operations for the citizen and vaccination center data
- Map users to specific vaccination centre's

### Project tasks:

- Create a database using MySQL
- Create the necessary code for the various layers of the application
  - Entity Layer: Create Vaccine Center and User entities with appropriate relationship mappings
  - Repository Layer: Create a layer for all database operations
  - Service Layer: Demonstrate dependency injection and interface segregation principle
  - Controller Layer: Expose necessary APIs such as:
    1. Add citizens to the database
    2. Retrieve all citizens
    3. Retrieve a specific citizen
    4. Retrieve all vaccination centers
    5. Retrieve a specific vaccination center by ID
    6. Retrieve a specific vaccination center and all its citizens in that city

**The flow and features of the application:**

- User can add the data of citizens to the MySQL database.
- User can retrieve all the citizens.
- User can retrieve the data of a specific citizen using id.
- Users can track the vaccination status of all citizens in the country.
- User can add a vaccination center to MySQL database.
- Users can map every citizen with a specific vaccination center.
- Users can enter a center id, and all citizens associated with that center will be retrieved.
- Users can retrieve all the vaccination centers.
- Users can retrieve a specific vaccination center by its id.
- Users can update the citizen's data.
- Users can enter a citizen ID and delete that citizen's data.
- Users can update the data of the vaccination center.
- Users can enter a center id and delete that center's data.

**Technology Specification:**

The following technologies are used in the development of this application:

- Java
- Spring Boot
- Spring Data JPA
- Spring MVC
- MySQL Database

**Validation (Frontend/Backend):**

- Users can retrieve the data of any citizen only if a valid ID has been provided.
- Users can retrieve the data of any vaccination center only if the valid center id has been provided.
- Vaccination status of any citizen must be fully vaccinated only if the count of vaccination is 2 for each citizen.

**Business Logic/Exception Scenarios:**

- Each citizen must be mapped with only one vaccination center. That means there will be One to One mapping between citizens and vaccination centers.
- If the mapping is already done for any citizen and again the user tries to map the citizen with another vaccination center, then the respective error message must be displayed.

**The following requirements should be met:**

- A high-quality application, including the features mentioned above, validations, and business logic, should be delivered at the end of the project.

**API Endpoints:**

Sr. No.	API	Endpoint
1	Retrieve all citizens	http://localhost:8086/citizens
2	Retrieve a specific citizen	http://localhost:8086/citizens/1
3	Retrieve all citizens associated with a specific center	http://localhost:8086/citizens/center/1
4	Retrieve all vaccination centers	http://localhost:8086/vaccinationcenter/
5	Retrieve a specific vaccination center	http://localhost:8086/vaccinationcenter/1
6	Connecting endpoint between vaccination center and citizens	http://localhost:8086/vaccinationcenter/citizens/
7	Update data of a specific citizen	http://localhost:8086/citizens/
8	Delete data of a specific citizen	http://localhost:8086/citizens/1
9	Update data of a specific vaccination center	http://localhost:8086/vaccinationcenter/
10	Delete a specific vaccination center	http://localhost:8086/vaccinationcenter/1

**Note:**

1. Do the APIs Functional Testing using Postman.
2. Create the documentation for these APIs using Swagger.