**ALOGARITHM:**

**1. Database Setup**: Create a MySQL database to store citizen and vaccination center information. Design and create tables for Citizen and Vaccine Center entities, considering appropriate relationship mappings.

**2. Entity Layer:** Implement the Vaccine Center and User (Citizen) classes/entities in the code, corresponding to the database tables. Define relationships between Vaccine Center and User entities.

**3. Repository Layer:** Create a repository layer to handle all database operations. Implement functions to perform CRUD operations on the Citizen and Vaccine Center entities, interacting with the MySQL database.

**4. Service Layer:** Design and implement the service layer to handle business logic and dependency injection. Demonstrate the interface segregation principle by creating separate interfaces for Citizen and Vaccine Center services.

**5. Controller Layer:** Develop a controller layer to expose APIs for the application's functionalities. Implement endpoints for the following operations:Add citizens to the database. Retrieve all citizens. Retrieve a specific citizen by ID. Retrieve all vaccination centers. Retrieve a specific vaccination center by ID Retrieve a specific vaccination center and all its citizens in that city.

**6. API Design:** Define appropriate request and response formats for each API endpoint. Ensure proper validation and error handling for user inputs.

**7. Integration:** Integrate the database, entity, repository, service, and controller layers to work together cohesively.

**8. Testing:** Thoroughly test the application's functionality, covering various scenarios and edge cases.

**9. Deployment:** Deploy the application on a suitable platform, considering scalability and security.

**10.Documentation:** Create detailed documentation for the application, including API documentation and setup instructions. Throughout the development process, ensure adherence to coding standards, security best practices, and optimal performance. Collaborate with relevant

stakeholders to gather feedback and make necessary improvements