**Exercise Statement:**

**ShopCart CRUD Application using Spring Boot, JPA, and H2**

**Objective:**

Create a simple **Spring Boot REST application** to simulate a basic **ShopCart system**, where users can:

* Add new products to the inventory
* View the list of available products
* Simulate purchasing products (which updates inventory quantity)
* Delete products from the inventory
* Update existing product details

**Technologies:**

* Java
* Spring Boot
* Spring Data JPA
* H2 In-Memory Database
* Spring Web (REST)

**Domain Model:**

**Product**

* id: Long (Primary Key, Auto-generated)
* name: String (e.g., "Laptop")
* price: Double
* quantityAvailable: Integer

**Requirements:**

**1. Add New Product**

* Implement an endpoint to add a new product to the system.
* Validate that the product name is not blank and the quantity is not negative.

**2. Get All Products**

* Provide a REST endpoint to fetch all products from the inventory.

**3. Purchase Product**

* Implement an endpoint to simulate a user purchasing a product.
* When a product is purchased:
  + Check if sufficient quantity is available.
  + Subtract the purchased quantity from the available stock.
  + If insufficient quantity, return a suitable error.

**4. Update Product Details**

* Create an endpoint to update product information like price or name.

**5. Delete Product**

* Provide an endpoint to delete a product by its id.

**Bonus:**

* Configure the H2 Console to be accessible via browser (/h2-console).
* Preload some product data using a CommandLineRunner or data.sql.

**Suggested Project Structure:**

com.example.shopcart

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├── controller

│ └── ProductController.java

├── entity

│ └── Product.java

├── repository

│ └── ProductRepository.java

├── service

│ └── ProductService.java

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├── ShopCartApplication.java

└── application.properties

**H2 Configuration Sample (application.properties)**

spring.datasource.url=jdbc:h2:mem:shopcartdb

spring.datasource.driverClassName=org.h2.Driver

spring.datasource.username=sa

spring.datasource.password=

spring.jpa.database-platform=org.hibernate.dialect.H2Dialect

spring.h2.console.enabled=true

spring.jpa.show-sql=true

spring.jpa.hibernate.ddl-auto=update

**Learning Outcomes:**

* Master CRUD operations using Spring Data JPA
* Understand entity modeling with relationships
* Work with in-memory H2 databases
* Handle business logic like product availability during purchase
* Build a layered architecture with controller, service, and repository