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**Exercise 1: Inventory Management System**

Scenario:

You are developing an inventory management system for a warehouse. Efficient data storage and retrieval are crucial.

Steps:

1. Understand the Problem:

o Explain why data structures and algorithms are essential in handling large inventories.

o Discuss the types of data structures suitable for this problem.

2. Setup:

o Create a new project for the inventory management system.

3. Implementation:

o Define a class Product with attributes like productId, productName, quantity, and price.

o Choose an appropriate data structure to store the products (e.g., ArrayList, HashMap).

o Implement methods to add, update, and delete products from the inventory.

4. Analysis:

o Analyze the time complexity of each operation (add, update, delete) in your chosen data structure.

o Discuss how you can optimize these operations.  
output:

