**Exercise 1: Inventory Management System**

**Scenario:**

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

**Understand the Problem:**

I use data structures and algorithms to efficiently store, retrieve, and manipulate large amounts of inventory data. They ensure quick access and updates, even as inventory grows.

**Types of Data Structures Suitable for This Problem**

**HashMap:**

I have used hashmap for this inventory management system.

Fast average O(1) operations (add, update, delete).

**How to Optimize These Operations**

1. **Load Factor Management:** Adjust HashMap load factor for better performance vs. memory use.
2. **Efficient Updates:** Only update when necessary to avoid redundancy.
3. **Batch Operations:** Group multiple updates or additions to reduce overhead.