**Exercise 1: Inventory Management System**

An inventory management system helps track and manage products in a warehouse. To handle many products efficiently, we need the right data structures and algorithms.

Using proper data structures makes operations like adding, updating, deleting, and searching faster. This is important when there are thousands of items. Without this, the system can become slow as more products are added.

Among available data structures:

* ArrayList keeps items in order but is slow for searching.
* HashMap is ideal when we use the product ID as a key. It allows quick access, addition, and deletion.
* TreeMap keeps items sorted, but it is a bit slower than HashMap.

In this system, I used HashMap because it offers fast operations:

* Add: O(1) average time
* Update: O(1) average time
* Delete: O(1) average time
* Display: O(n) time to go through all products

To improve the system further:

* Use TreeMap if sorting is needed.
* Add extra maps or filters to search by name or price.
* Use databases for storing large data permanently.
* For multiple users, use thread-safe structures like ConcurrentHashMap.