**Analysis**

**Time Complexity:**

* **Add Operation:** O(1) on average (HashMap operations are average O(1) due to hash-based indexing).
* **Update Operation:** O(1) on average (same as add operation since updating involves replacing the value associated with a key).
* **Delete Operation:** O(1) on average (removing an entry is also O(1) on average).

**Optimization:**

* **Data Structure Choice:** HashMap is generally efficient, but if there are specific needs for sorted order or range queries, consider TreeMap or a different data structure.
* **Capacity and Load Factor:** Ensure that the HashMap is properly sized by initializing it with a reasonable capacity and load factor to avoid frequent resizing.
* **Concurrency:** If the inventory needs to be accessed by multiple threads, consider using ConcurrentHashMap or other thread-safe alternatives to avoid concurrency issues.