**Exercise 1: Inventory Management System**

Algorithms and data structures are essential for effective inventory management. While algorithms handle searching, retrieval, and complicated tasks like replenishment and forecasting, data structures organize and store item information. Inventory management systems can save costs and increase efficiency by optimizing these factors, which will lead to quicker search times, accurate records, and better decision-making.

Java's Map interface, with its key-value format, is ideal for inventory management. Product IDs are used as keys to efficiently retrieve values that record information about a product. Maps can be dynamically updated to reflect changes in quantity, pricing, or other characteristics. Although TreeMap provides sorted order when needed, ConcurrentHashMap guarantees thread safety for concurrent access, and HashMap is typically chosen for its speed. Maps are an invaluable tool for efficiently managing inventory data because of their performance and adaptability.

The time complexity for every add, update, delete functions works on O(1). So, it is constant. But the Space Complexity is O(n).