**Analysis**

**Time Complexity Analysis**

* **Add Product**: In a HashMap, the average time complexity for insertion is O(1)O(1)O(1).
* **Update Product**: Updating a product involves replacing the existing value, which is also O(1)O(1)O(1).
* **Delete Product**: Deletion from a HashMap has an average time complexity of O(1)O(1)O(1).
* **Retrieve Product**: Retrieval by key in a HashMap is O(1)O(1)O(1) on average.

**Optimization Strategies**

* **Rehashing**: Ensure that the HashMap has a proper load factor to avoid too many collisions, which can degrade performance to O(n)O(n)O(n).
* **Concurrency**: For a multi-threaded environment, consider using ConcurrentHashMap for thread-safe operations.
* **Indexing**: If lookups by multiple attributes (other than productId) are required frequently, consider additional indexing mechanisms or secondary data structures.