## Inventory Management System

1. Data Structures:

* helpful in the organization of the inventory
* reduce the time complexity of searching so that it becomes more efficient
* simplify insertion, deletion, modification of data

2. Data Structures for this System:

* HashMap: this data structure provides a means to store products along with their IDs. This helps us to search for a product based on it's ID

3. Time Complexity:

* addProduct() : O(1). HashMap requires constant time to add a new Record
* updateQuantity() : O(1). HashMap requires constant time to search and update a record
* updatePrice() : O(1). HashMap requires constant time to search and update a record
* deleteProduct() : O(1). HashMap requires constant time to search and delete a record
* display() : O(n). we need to traverse the whole HashMap to print all products

HashMap utilizes id which is referred to as a key and if we are searching with a key it takes constant time.

4. Optimization:

* We can utilize caching if we are attempting to frequently retrieve a specific product