**Pharmacy Inventory**

**Overview:**

This is a pharmacy inventory assignment: we are trying to manage the medicines in the inventory

**Given Problem Statement:**

Apollo pharmacy store requires your assistance in implementing a medicine inventory tracker system. The objective is to keep a track of each product and also determine which ones to order if they are less than a specific quantity. In order to maintain this information, each drug has a unique identification number and a counter to keep a track of its available quantity in the system.

**Objective:**

Main objective is to write a python code for Pharmacy inventory using Binary tree Abstract Datatype and some functions to update , read or write in the Binary tree.

**Data Structure:**

Binary tree is created by using nodes and Basic structure of node used is below

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Left** | **Available**  **Count** | **Unique id** | **Checkout**  **counter** | **Right** |

Here we are using linked list to create Binary tree because it takes less time to perform insertion, deletion and updating operation in the Binary tree**.**

**Design:**

* The purchase and sell orders will be populated in a file named as InputPS1.txt. We will be collecting the unique ID and quantity from this file with a recursive function. There will be 2 counters for checking, one for counting the available quantity of medicine and another for checking the number of occurrences of unique ID mentioned as ‘checkout counter’. If the checkout counter is odd, it’s a purchase and if the checkout counter is even, it’s a sell order. Hence, the availability counter will be incremented with the quantity mentioned against the unique ID if the checkout counter is odd. The availability counter will be decremented with the quantity mentioned against the unique ID if the checkout counter is even.
* If the given input unique ID is not in the existing inventory, it will be appended to the inventory and checkout counter will be set as “1”. The updated drug list with unique ID needs to be captured for catering planning team requirement.
* We need to prompt the medicine ID’s if the available count is less than a certain number / buy or sell occurs above a certain number and supply shortage in output according to the prompt.
* When there are no shortage medicines ,Code will print “Quantity of all medicines is more than minimum units”
* If all medicines are in stock ,Code will print “All medicines are in stock”
* Algorithm will check for the existence of inputPS1.txt and promptsPS1.txt files in the current working directory.
* There is a function in code which is used to check the existence of node in the Binary tree.
* All the mentioned functions in the problem statement are implemented according to the conditions given in them.
* The output will be saved in a file named as outputps1.txt. This file contains outputs according to the inputs from the promptsPS1.txt

**Time Complexity:**

* Complexity of inserting a node or updating a node or checking the status of node or printing the medicines in the inventory or status of supply shortage or status of high demand or status of out of stock is **O(n)**
* As we have promptsPS.txt which is used to run the functions above mentioned if number of commands in the prompts file is **n ,** then complexity of executing full code is **O(n^2)**

**Alternate Modelling:**

* Pharmacy inventory can also be implemented using Binary search tree. Binary tree is unordered and Binary search tree has ordered characteristics.
* In the current implementation, we are not checking the node values before we add it to the binary tree. If we use Binary search tree implementation, we need to check the node value before we add it to the tree this makes the major difference in operations on the tree.
* Inserting, deleting, updating of nodes in the Binary search tree is faster than Binary tree, because of characteristics of the Binary tree.
* In Binary search tree nodes that are placed in left subtree are less than node and nodes that are placed in right subtree are greater than the node.

**Input & Output format**

**InputPS1 - (Input)**

121, 10

122, 6

111, 10

112, 6

113, 1

123, 6

**PromptsPS1 - (Input)**

printStockOut

updateDrugList: 112, 8

checkDrugStatus: 112

freqDemand: sell, 2

supplyShortage: 10

printDrugInventory

**OutputPS1 – (Output)**

------------- printStockOut ---------------

The following medicines are out of stock:

All medicines are in stock

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Quantity of Drug Id 112 available is 6 but asked is 8

------------- checkDrugStatus:112 ---------------

Drug id 112 entered 2 times into the system. Its last status was ‘buy’ and currently have 6 units available

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Drugs with sell entries more than 2 times are:

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------------- supplyShortage: 10 ---------------

121 10

122 6

113 1

123 6

111 10

112 6

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------------- printDrugInventory ---------------

Total number of medicines entered in the inventory: 6

111,10

112,6

113,1

121,10

122,6

123,6

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