

# **DRUGSTORE MANAGEMENT**

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## **Abstract:**

The Drugstore Management application has been built using data structures such as binary search trees and queues. Using this application, the user can perform operations such as add new medicines, update the stock of medicines, search for a particular medicine, display the details of all the medicines available, check for the validity of a particular medicine and sell medicines to a customer.

## **Methodology:**

The different operations that can be performed using this application are:

1. Add new medicines
2. Update the stock of existing medicines
3. Search for a particular medicine
4. Display all the medicines in the inventory
5. Sell medicines to a customer along with the generation of a bill
6. Check for the validity of a particular medicine

The different modules used in implementing these operations are:

**#main.c** (this file contains the main driver program)

*void disp\_menu()*

The ***disp\_menu()*** function is used to display the menu of all the operations available in the application.

**#queue.h** (this file contains the queue ADT and operations implemented using queue)

*int dater(int x)*

The ***dater(int x)*** is a sub-function that is used in preceding functions, used to calculate the number of days between two dates.

*int validate(struct Date m, struct Date e)*

The ***validate(struct Date m, struct Date e)*** function is used to calculate the difference between two dates (which are given as inputs) – today and the expiry date specified for the medicine and hence returns the validity.

*queue\* createQueue(int maxelements)*

The ***createQueue(int maxelements)*** function creates a queue for each drug that is added to the drug inventory, so that new batches can be added, taking the maximum number of elements as input and returning the queue itself.

*int isFull(queue\* q)*

The ***isFull(queue\* q)*** function checks if the specified queue is full and returns 1 if true.

*int isEmpty(queue\* q)*

The ***isEmpty(queue\* q)*** function checks if the specified queue is empty and returns 1 if true.

*void enqueue(queue\* q, int total)*

The ***enqueue(queue\* q, int total)*** function is used to enqueue a batch of medicines for a particular drug, each time the stock is updated. Hence, it takes the drug's queue and the amount updated as input.

*void sell(queue \*q, int amt)*

The ***sell(queue \*q, int amt)*** is simply a dequeue function that removes the stock each time a particular drug is purchased, thus reducing the available stock. Hence, it takes the drug's queue and the amount bought as input.

*void disp(queue \*q)*

The ***disp(queue \*q)*** function displays all the details that have been entered about a particular drug, taking the particular drug's queue as input.

**#tree.h** (this file contains tree ADT and the operations implemented using tree)

*queue\* give\_queue(tree\* t, char name[])*

The **give\_queue(tree\* t, char name[])** function returns the batch of medicine added for a particular drug, retrieving it from the queue. Hence, it takes the drug's queue and the name of drug as inputs.

*float give\_cost(tree\* t, char name[])*

The **give\_cost(tree\* t, char name[])** function returns the cost of a particular drug that has been entered, retrieving it from the binary search tree. Hence, it takes the drug's queue and the name of drug as inputs.

*tree\* givetree(tree\* t, char name[])*

The **givetree(tree\* t, char name[])** function returns the entire tree that consists of details of the particular drug. The details stored in the drug are: ID, name of drug, name of supplier, manufacture date, expiry date, price per tab and number of tabs. Hence, it takes the drug's queue and the name of drug as inputs.

*void cal\_tot(tree\* t)*

The **cal\_tot(tree\* t)** function calculates the total number of medicines.

*tree\* insert(tree\* t, tree\* temp)*

The **insert(tree\* t, tree\* temp)** is used to add new drugs to the binary search tree in alphabetical order. Hence, it takes the main binary search tree and a temporary node that contains the drug details as input. The details stored in the drug are: ID, name of drug, name of supplier, manufacture date, expiry date, price per tab and number of tabs.

*void display(tree\* t)*

The **display(tree\* t)** function is used to display the details in the binary search tree, in this case, all the attributes of the medicine.

*int check(tree\* t, int a)*

The **check(tree\* t, int a)** function is used to check the validity of a medicine based on its expiry date and returns true if the medicine has expired.

*int warn(tree\* t)*

The **warn(tree\* t)** function is used to warn the user if the medicine has exceeded validity.

*void search(tree\* t, char name[50])*

The **search(tree\* t, char name[50])** function is used to search for a particular drug in the binary search tree and display its details.

```
void inorder(tree *t)
```

The ***inorder(tree \*t)*** function is used to traverse the binary search tree in inorder traversal method.

## Output:

```
=====
                                WELCOME TO ABC PHARMACEUTICALS
=====

      MENU
      -----
      1. Add new medicine
      2. Update stock
      3. Search medicine
      4. Display
      5. Sell
      6. Validity check
      7. Quit

Option:      1

Adding medicine.....

Enter id      : 1
Enter name    : Crocin
Enter seller  : Apex
Enter quantity(tabs): 30
Price/tab     : 3

Enter manufacture date(dd mm yyyy) : 01 01 2019
Enter expiry date      (dd mm yyyy): 01 01 2021
MEDICINE ADDED!
```

### Option 1: Crocin along with its details are added to the drugstore inventory

```
      MENU
      -----
      1. Add new medicine
      2. Update stock
      3. Search medicine
      4. Display
      5. Sell
      6. Validity check
      7. Quit

Option:      1

Adding medicine.....

Enter id      : 2
Enter name    : Dolokind
Enter seller  : Accord
Enter quantity(tabs): 50
Price/tab     : 2

Enter manufacture date(dd mm yyyy) : 10 10 2019
Enter expiry date      (dd mm yyyy): 10 10 2020
MEDICINE ADDED!
```

### Option 1: Dolokind along with its attributes are added to the drugstore inventory

```

      MENU
      1. Add new medicine
      2. Update stock
      3. Search medicine
      4. Display
      5. Sell
      6. Validity check
      7. Quit

Option:      2

Updating stock....

Enter the name of medicine: Crocin

Enter the amount you want to buy: 5

Enter manufacture date(dd mm yyyy) : 15 10 2017
Enter expiry date      (dd mm yyyy): 15 10 2019

STOCK UPDATED!

```

**Option 2: the stock for Crocin is updated and added to queue based on its expiry date**

```

Option:      4

-----
ID           :1
Name         :Crocin
Seller       :Apex
Total Quantity :35 tabs
Price/tab    :Rs.3.00
Stock        :
Batch 1      Quantity  Manufacture Date  Expiry Date  Validity(days)
Batch 1      30        1/ 1/2019        1/ 1/2021    445
Batch 2      5         15/10/2017       15/10/2019    1
-----

ID           :2
Name         :Dolokind
Seller       :Accord
Total Quantity :50 tabs
Price/tab    :Rs.2.00
Stock        :
Batch 1      Quantity  Manufacture Date  Expiry Date  Validity(days)
Batch 1      50        10/10/2019       10/10/2020    361
-----

```

**Option 4: details are displayed of all the existing medicines available in the drugstore along with all their attributes**

```

      MENU
      1. Add new medicine
      2. Update stock
      3. Search medicine
      4. Display
      5. Sell
      6. Validity check
      7. Quit

Option:      3

Search Results...

Enter name to search: Crocin

-----
ID           :1
Name         :Crocin
Seller       :Apex
Total Quantity :35 tabs
Price/tab    :Rs.3.00
Stock       :
Batch 1      Quantity  Manufacture Date  Expiry Date  Validity(days)
Batch 1      30        1/ 1/2019        1/ 1/2021    445
Batch 2      5         15/10/2017       15/10/2019    1
-----
```

**Option 3:** this is used to search for a medicine and the consequently, the details are displayed – here, Crocin is searched for

```

Enter the name of medicine: Crocin
Enter the amount you want to sell: 10

Validity of Crocin is 1 days please dispose medicine immediately!!
1-dispose now
2-Remind me later
Option: 2

Do you want to continue ? (y/n): y

Enter the name of medicine: Dolokind
Enter the amount you want to sell: 5

Do you want to continue ? (y/n): y

Enter the name of medicine: Crocin
Enter the amount you want to sell: 5

Validity of Crocin is 1 days please dispose medicine immediately!!
1-dispose now
2-Remind me later
Option: 2

Do you want to continue ? (y/n): n

-----
BILL
-----
ITEM.NO NAME  QTY  PRICE
1      Crocin  10   30.00
2      Dolokind  5   15.00
3      Crocin  5   15.00

TOTAL :Rs.60.00
-----
```

**Option 5:** drugs are sold as the drug name and quantity are entered and subsequently, the bill is generated – here, Crocin and Dolokind are bought

```

      MENU
      1. Add new medicine
      2. Update stock
      3. Search medicine
      4. Display
      5. Sell
      6. Validity check
      7. Quit

Option:      4

-----
ID           :1
Name         :Crocin
Seller       :Apex
Total Quantity :20 tabs
Price/tab    :Rs.3.00
Stock       :
  Quantity   Manufacture Date  Expiry Date  Validity(days)
Batch 1      15               1/ 1/2019      1/ 1/2021      445
Batch 2       5               15/10/2017     15/10/2019       1
-----

-----
ID           :2
Name         :Dolokind
Seller       :Accord
Total Quantity :45 tabs
Price/tab    :Rs.2.00
Stock       :
  Quantity   Manufacture Date  Expiry Date  Validity(days)
Batch 1      45               10/10/2019   10/10/2020     361
-----

```

**Option 4: the details of the available medicines are displayed**

```

      MENU
      1. Add new medicine
      2. Update stock
      3. Search medicine
      4. Display
      5. Sell
      6. Validity check
      7. Quit

Option:      6

Validity of Crocin is 1 please dispose medicine immediately!!

1-dispose now
2-Remind me later
Option: 2

```

**Option 6: performs a validity check on the existing stock of medicines and displays alert if the medicine is about to expire soon – here, Crocin expires in 1 day and hence it can either be disposed right away or a reminder can be sent in later**

```

    MENU
    1. Add new medicine
    2. Update stock
    3. Search medicine
    4. Display
    5. Sell
    6. Validity check
    7. Quit

Option: 7

Thank you for using our service. For details contact- 235-4590

Please ensure you take your belongings when you leave
```

**Option 7: exits the program**

## Conclusion:

Hence, a real-world problem such as drugstore management has been designed and implemented using data structures. The use of data structures has enhanced the way in which the operations are done and has provided additional functionality to the application.