

CS19101 PDS laboratory

Assignment9

Write your program in a file named `A9_1_<machine number>_<Roll no.>.c` (without the '`<`' and '`>`'). Put the file into a compressed directory named `A9_<machine number>_<Roll no.>.zip` and submit it.

Example: If your roll number is `19DEP99999` and your machine number is `99`, then the name of your file should be `A9_1_99_19DEP99999.c`.

In this assignment, you will build a program to keep track of items in a super-market. Each item has a name (string of length at most 100, may contain blank spaces), an ID (string of length at most 20), a price (integer), an expiry date (integer in `ddmmyy` format, -1 if not applicable), and amount available in the store (an integer, denoting number of pieces for knives, number of kilograms for rice, number of litres for milk, number of packets for biscuits, etc.). Make the following structure declaration to store this information:

```
struct Item
{
char Name[100];
char Id[20];
int price;
int expiry;
int amount;
struct Item *next;
};
```

1. In `main()`, ask the user to enter item details. Once the user enters details of one item, ask if she wants to enter more by pressing 1 or 0. Continue accepting details of items as long as the user chooses to enter (by pressing 1). Assume that the user enters the items in non-decreasing order of the price value (cheapest item first). While the user enters the details, store them into a linked-list of structure variables of the above type by dynamic memory allocation. Make sure that the pointer entry of the last node is `NULL`. Then print the details on the screen as follows with each detail in a new line.

```
Broomstick
BRM
```

25
-1
30
Paracetamol
MEDC
50
200321
500
Basmati rice
BR
65
110920
200

[10 marks]

2. Note that after part 1, the linked-list that you have created is sorted with respect to the price values. The user entered in non-decreasing order of price values. If you inserted items in the front of your list, the list is now sorted in non-increasing order of price values. Display the following on the screen:

Press 1 to enter an item
Press 2 to remove an item
Press 3 to display
Press 4 to exit

If the user presses 1, take the details of an item as input through the keyboard. If the same item ID is already present in the linked-list, increment the corresponding amount field by the amount entered by the user. If the item is not present, then dynamically allocate a structure variable of type **Item**, store the new item details there, and insert it in the appropriate place in the list so that the final list is sorted with respect to price. Display:

Press 1 to enter an item
Press 2 to remove an item
Press 3 to display
Press 4 to exit

If the user presses 2, ask the user for the item ID and an amount. If an item with the entered ID is not present in the linked-list, print “item missing”. If an item with the entered ID is present in the list, decrement its amount field by the entered amount. If the new amount is less than or equal to 0, remove the node from the linked-list. Display:

Press 1 to enter an item
Press 2 to remove an item
Press 3 to display
Press 4 to exit

If the user presses 3, display the content of the linked-list, with each detail in a new line. Then display:

Press 1 to enter an item
Press 2 to remove an item
Press 3 to display
Press 4 to exit

If the user presses 4, exit the program.

Sample input/output:

Enter item name, ID, price, expiry and amount:

Boroline antiseptic cream

BORO

25

121221

35

Enter more (1/0) 1

Notebook

NB

35

-1

431

Enter more (1/0) 1

Tomato ketchup

TOKT

40

300120

26

Enter more? (1/0) 0

Boroline antiseptic cream

BORO

25

121221

35

Notebook

NB

35

-1
431
Tomato ketchup
TOKT
40
300120
26
Press 1 to enter an item
Press 2 to remove an item
Press 3 to display
Press 4 to exit
1
Enter item name, ID, price, expiry and amount:
Pen
PEN
2
-1
100
Press 1 to enter an item
Press 2 to remove an item
Press 3 to display
Press 4 to exit
2
Enter ID and amount: FRP
21
Item not present
Press 1 to enter an item
Press 2 to remove an item
Press 3 to display
Press 4 to exit
2
Enter ID and amount: BORO
2
Press 1 to enter an item
Press 2 to remove an item
Press 3 to display
Press 4 to exit
3
Pen
PEN
2
-1

100
Boroline antiseptic cream
BORO
25
121221
33
Notebook
NB
35
-1
431
Tomato ketchup
TOKT
40
300120
26
Press 1 to enter an item
Press 2 to remove an item
Press 3 to display
Press 4 to exit
4

[25 marks]