COP3223, Assignment 5, Linked List

Problem: Food Bank Donations Program, using a Linked List

This program will be similar to the problem in Assignment 3 except instead of arrays, we will solve this with a linked list. This will allow for the program to account for any number of foodtypes that are donated rather than a maximum of 100 foodtypes that we had with our solution in Assignment 3.

For this Assignment 5, you only have to implement depositing into the donation table (Option 1 from Assign3) and the status report(Option 4 from Assign3). Here is the modified problem statement for this assignment:

A Food Bank is a non-profit organization which distributes food items to people in need during local emergencies and other trying times. People come in to a Food Bank and make their donations, and others might come in to make a request for any food item they want. This Food Bank in particular is only concerned with keeping track of donated items.
This Food Bank's Program is used to keep track of the stock the Food Bank has; i.e., the donations and printing the status report which consists of the foodtype and amount of stock present in the food bank.
You are required to make a linked list that holds the donations. Each node will have two fields: the donation item's Name, which is what type of food item it is, e.g., Milk, Bread, Fruit, Meat, etc., and the Amount, which is the amount of that food item, e.g., 20, 30, etc. Note: For simplification, no units for amounts are considered.

Functionality Specification
1. Add donations to the table(list) in the order they are added. (You will be inserting at the back of the list)
2. For any new donation that comes in, check if any donation is present in the donations table with the same inventory type (foodtype); if there is one then increase its amount by the new donation amount, and do not add a new entry in the donations table. If one is not present, then add a new entry in the donations table for that donation type (add it to the back of the list).
3. Print the status report, containing stock currently available. (This will involve iterating through or TRAVERSING the linked list)

Input/Output Specification
At the beginning, the program should present the user with the available options, and ask for his/her choice. Based on the choice, the program should perform the corresponding task.
The user will be shown 3 choices (choices 2 and 3 are reserved for future development):
1. Enter a Donation
4. Print status report
5. Exit

When the user selects '1', the program should ask the user for the inventory type and amount of the donation to be made. When the handling of the donation is completed, that is, the donation has been added to the donations table (list), the program should notify the user by printing out "Donation Added".
When the user selects '4', the program should print the current Donations Table (list). If there are no donations, simply print, "No Donations are present!"

When the user selects '5', the program should print "Thank You for running the software. Bye for now", and then the program exits.

Implementation Requirements

You must use this struct for all nodes in the linked list.

```
struct donaNode {
        char donInvType[30];
        float donAmount;
        struct donaNode *link;
};
```

Implementation Hints

Use function 'strcmp' to compare if two strings are equal. Remember that when the two strings are equal this function returns 0.
Use function 'strcpy' to copy from one string variable to another.
For every incoming donation you will have to check if the inventory type of that donation is present in the donations table or not. For this, use the 'strcmp' function.
Assume that all inputs are perfectly correct, so you don't have to do any error checking on the input.

Function Hints

For checking if donations are in the table already:

- Take in the donation item
- Iterate through the list (traverse the list) and check each node's donInvType
- You may want to return the node's address if it is found, NULL if not found

For adding donations:

- Take in the input
- Check if donation item is in the donation table already
    - If so, update the donation's node's donAmount
- If the donation item is new to the table, create the node using malloc and insert it at the back of the list

For printing the status report:

- Iterate through the list and print each node's information

Try to write this program with 1) a function for telling if the word is in the list;
2) a function for inserting a new node at the back of the list; and 3) a function for printing the list

Sample Run 1

```
Welcome to the Food Bank Program
1. Add a donation
4. Print status report
5. Exit
```

```
Enter your choice:_1_
Enter inventory type: YOGURT
Enter the amount: 5
Donation Added!
Press any key to continue . . .

Welcome to the Food Bank Program
1. Add a donation
4. Print status report
5. Exit

Enter your choice:_1_
Enter inventory type: EGGS
Enter the amount: 12
Donation Added!
Press any key to continue . . .



Welcome to the Food Bank Program
1. Add a donation
4. Print status report
5. Exit

Enter your choice:_1_
Enter inventory type: MILK
Enter the amount: 2
Donation Added!
Press any key to continue . . .

Welcome to the Food Bank Program
1. Add a donation
4. Print status report
5. Exit

Enter your choice:_4

Printing Donations Table…

YOGURT 5
EGGS 12
MILK 2
Press any key to continue . . .

Welcome to the Food Bank Program
1. Add a donation
4. Print status report
5. Exit
```

```
Enter your choice:_5
Thank You for using the software. Bye for now.
```

Sample Run 2, to test -----EMPTY LIST/NO DONATIONS-----

```
Welcome to the Food Bank Program
1. Add a donation
4. Print status report
5. Exit

Enter your choice:_4

Printing Donations Table…

No Donations are present!

Press any key to continue . . .


Welcome to the Food Bank Program
1. Add a donation
4. Print status report
5. Exit

Enter your choice:_1_
Enter inventory type: ORANGE
Enter the amount: 4
Donation Added!
Press any key to continue . . .

Welcome to the Food Bank Program
1. Add a donation
4. Print status report
5. Exit

Enter your choice:_1_
Enter inventory type: MANGO
Enter the amount: 12
Donation Added!
Press any key to continue . . .


Welcome to the Food Bank Program
1. Add a donation
4. Print status report
5. Exit

Enter your choice:_4
```

```
Printing Donations Table…

ORANGE 4
MANGO 12
Press any key to continue . . .

Welcome to the Food Bank Program
1. Add a donation
4. Print status report
5. Exit

Enter your choice:_5
Thank You for using the software. Bye for now.
```