Merge two sorted linked lists

locked

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This challenge is part of a tutorial track by MyCodeSchool

Submissions: 130
Max Score: 25
Difficulty: Easy

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You're given the pointer to the head nodes of two sorted linked lists. The data in both lists will be sorted in ascending order. Change the `next` pointers to obtain a single, merged linked list which also has data in ascending order. Either head pointer given may be null meaning that the corresponding list is empty.

Input Format

You have to complete the `SinglyLinkedListNode MergeLists(SinglyLinkedListNode headA, SinglyLinkedListNode headB)` method which takes two arguments - the heads of the two sorted linked lists to merge. You should NOT read any input from stdin/console.

The input is handled by the code in the editor and the format is as follows:

The first line contains an integer t, denoting the number of test cases.
The format for each test case is as follows:

The first line contains an integer n, denoting the length of the first linked list.
The next n lines contain an integer each, denoting the elements of the linked list.
The next line contains an integer m, denoting the length of the second linked list.
The next m lines contain an integer each, denoting the elements of the second linked list.

Constraints

- $1 \leq t \leq 10$
- $1 \leq n \leq 1000$
- $1 \leq list_i \leq 1000$, where $list_i$ is the i^{th} element of the list.

Output Format

Change the `next` pointer of individual nodes so that nodes from both lists are merged into a single list. Then `return` the head of this merged list. Do NOT print anything to stdout/console.

The output is handled by the editor and the format is as follows:

For each test case, print in a new line, the linked list after merging them separated by spaces.

Sample Input

```
1
3
1
2
3
2
3
4
```

Sample Output

```
1 2 3 3 4
```

Explanation

The first linked list is: 1 -> 2 -> 3 -> NULL

The second linked list is: 3 -> 4 -> NULL

Hence, the merged linked list is: 1 -> 2 -> 3 -> 3 -> 4 -> NULL

Current Buffer (saved locally, editable) C++

```
#include 

using namespace std;

class SinglyLinkedListNode {
    public:
        int data;
        SinglyLinkedListNode *next;

        SinglyLinkedListNode(int node_data) {
            this->data = node_data;
            this->next = nullptr;
        }
};
class SinglyLinkedList {
    public:
        SinglyLinkedListNode *head;
        SinglyLinkedListNode *tail;

        SinglyLinkedList() {
            this->head = nullptr;
            this->tail = nullptr;
        }

        void insert_node(int node_data) {
            SinglyLinkedListNode* node = new SinglyLinkedListNode(node_data);

            if (!this->head) {
                this->head = node;
            } else {
                this->tail->next = node;
            }

            this->tail = node;
        }
};

void print_singly_linked_list(SinglyLinkedListNode* node, string sep, ofstream& fout) {
    while (node) {
        fout << node->data;

        node = node->next;

        if (node) {
            fout << sep;
        }
    }
}

void free_singly_linked_list(SinglyLinkedListNode* node) {
    while (node) {
        SinglyLinkedListNode* temp = node;
        node = node->next;

        free(temp);
    }
}
// Complete the mergeLists function below.

/*
 * For your reference:
 *
 * SinglyLinkedListNode {
 *     int data;
 *     SinglyLinkedListNode* next;
 * };
 *
 */
SinglyLinkedListNode* mergeLists(SinglyLinkedListNode* head1, SinglyLinkedListNode* head2) {
SinglyLinkedListNode* result=nullptr;
    SinglyLinkedListNode* cur1=head1;
    SinglyLinkedListNode* cur2=head2;
    if(head1==nullptr){
        return head2;
    }
    else if(head2==nullptr){
        return head1;
    }
    if(cur1->data<=cur2->data){
        result=cur1;
        cur1=cur1->next;
        result->next=mergeLists(cur1,cur2);
    }
    else{
         result=cur2;
        cur2=cur2->next;
        result->next=mergeLists(cur1,cur2);
    }
    return result;

}
int main()
{
    ofstream fout(getenv("OUTPUT_PATH"));

    int tests;
    cin >> tests;
    cin.ignore(numeric_limits<streamsize>::max(), '\n');

    for (int tests_itr = 0; tests_itr < tests; tests_itr++) {
        SinglyLinkedList* llist1 = new SinglyLinkedList();

        int llist1_count;
        cin >> llist1_count;
        cin.ignore(numeric_limits<streamsize>::max(), '\n');

        for (int i = 0; i < llist1_count; i++) {
            int llist1_item;
            cin >> llist1_item;
            cin.ignore(numeric_limits<streamsize>::max(), '\n');

            llist1->insert_node(llist1_item);
        }

        SinglyLinkedList* llist2 = new SinglyLinkedList();

        int llist2_count;
        cin >> llist2_count;
        cin.ignore(numeric_limits<streamsize>::max(), '\n');

        for (int i = 0; i < llist2_count; i++) {
            int llist2_item;
            cin >> llist2_item;
            cin.ignore(numeric_limits<streamsize>::max(), '\n');

            llist2->insert_node(llist2_item);
        }

        SinglyLinkedListNode* llist3 = mergeLists(llist1->head, llist2->head);

        print_singly_linked_list(llist3, " ", fout);
        fout << "\n";

        free_singly_linked_list(llist3);
    }

    fout.close();

    return 0;
}
```

Line: 36 Col: 1

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