Inserting a Node Into a Sorted Doubly Linked List *



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Problem

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Given a reference to the head of a doubly-linked list and an integer, data, create a new DoublyLinkedListNode object having data value data and insert it at the proper location to maintain the sort.

Example

head refers to the list $1 \leftrightarrow 2 \leftrightarrow 4 \rightarrow NULL$

data = 3

Return a reference to the new list: $1 \leftrightarrow 2 \leftrightarrow 3 \leftrightarrow 4 \rightarrow NULL$.

Function Description

Complete the sortedInsert function in the editor below.

sortedInsert has two parameters:

- DoublyLinkedListNode pointer head: a reference to the head of a doubly-linked list
- int data: An integer denoting the value of the data field for the DoublyLinkedListNode you must insert into the list.

Returns

• DoublyLinkedListNode pointer: a reference to the head of the list

Note: Recall that an empty list (i.e., where **head = NULL**) and a list with one element are sorted lists.

Input Format

The first line contains an integer \boldsymbol{t} , the number of test cases.

Each of the test case is in the following format:

- The first line contains an integer **n**, the number of elements in the linked list.
- Each of the next n lines contains an integer, the data for each node of the linked list.
- The last line contains an integer, data, which needs to be inserted into the sorted doubly-linked list.

Constraints

- $1 \le t \le 10$
- $1 \le n \le 1000$
- $1 \leq DoublyLinkedListNode.data \leq 1000$

Sample Input

```
STDIN Function
1
      t = 1
      node data values = 1, 3, 4, 10
3
4
10
      data = 5
```

Sample Output

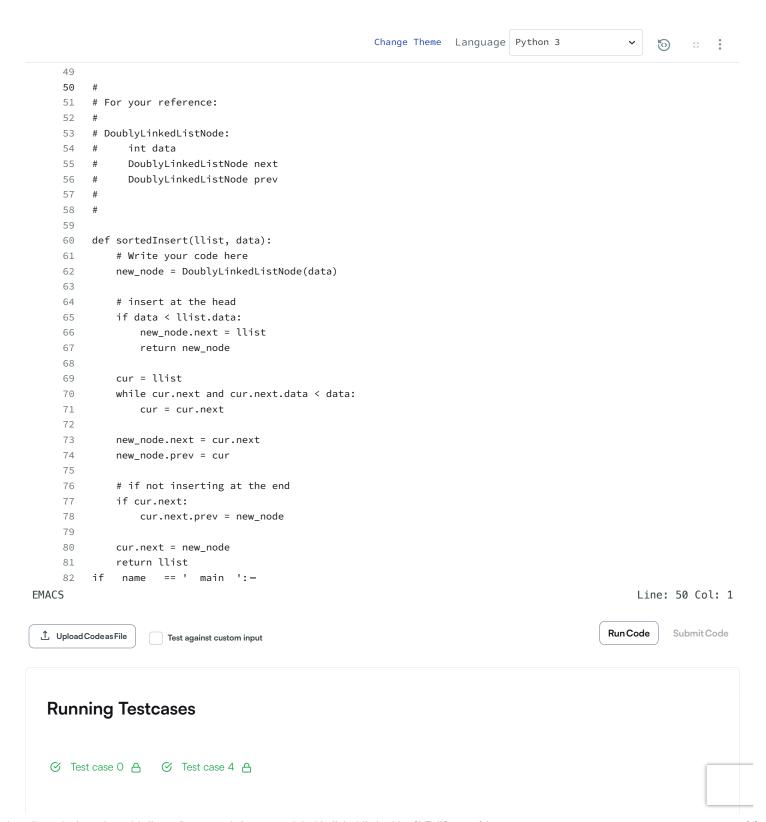
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1 3 4 5 10

Explanation

The initial doubly linked list is: $1 \leftrightarrow 3 \leftrightarrow 4 \leftrightarrow 10 \rightarrow \textit{NULL}$.

The doubly linked list after insertion is: $1\leftrightarrow 3\leftrightarrow 4\leftrightarrow 5\leftrightarrow 10\to NULL$



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