

# Assignment III — Linked list

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Deadline: November 14, 11:59 pm, 2024

## Problem: Finding peak values in a linked list (100%)

### Description

In Assignment 3, you will practice operations of creating, inserting, deleting, and searching using linked lists. In this assignment, you need to create two linked lists and merge them. Finally, all the peak values are found, and the results are output.

The first line of input contains a positive integer  $k$ , which denotes the number of nodes to merge from two linked lists. The second line contains  $m$  positive integers separated by spaces, which denote the elements of the first list. The third line is a fixed integer (-1), which is a delimiter followed by the second list, consisting of  $n$  positive integers in the fourth line.

First, merge the two lists based on the positive integer  $k$ . The value indicates the number of nodes to merge each time. During odd-numbered merges, merge  $k$  nodes from the first list followed by  $k$  nodes from the second list. During even-numbered merges, merge  $k$  nodes from the second list followed by  $k$  nodes from the first list. After merging is completed, output the result once.

Finally, find all the peak values, delete non-peak values from the merged list, and then output the result.

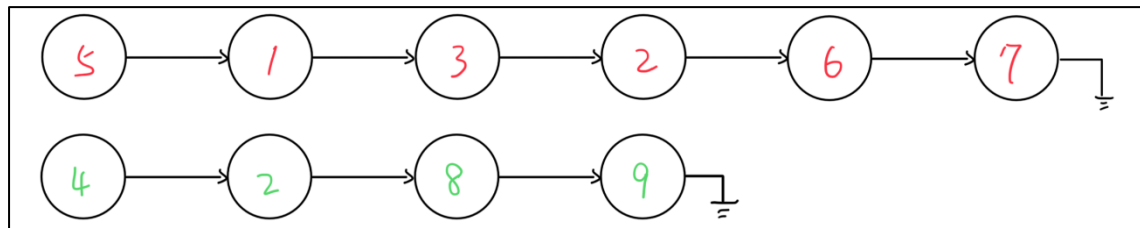
**Note: a peak value is a value that is strictly greater than its neighbors.**

### Test case examples

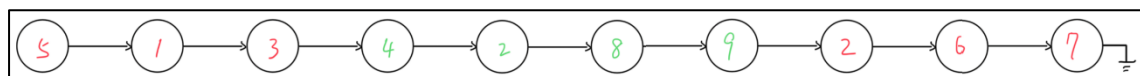
Sample Input	Sample Output
3 5 1 3 2 6 7 -1 4 2 8 9	5->1->3->4->2->8->9->2->6->7 5->4->9->7

## Example:

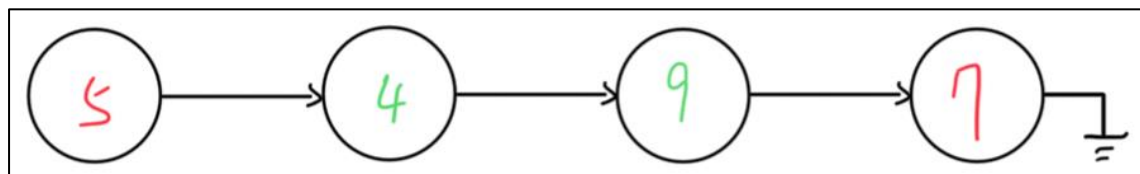
### 1. Create two linked lists



### 2. Merge two lists (k=3)



### 3. Find the peak values and delete all non-peak values



## Constraints:

- $1 \leq m, n \leq 10000$  (m and n are the number of nodes for the first and the second list, respectively)
- $k \leq m, n$
- $1 \leq \text{node value} \leq 2^{31} - 1$
- This assignment must be implemented by using **Linked list**; otherwise, you will get a zero.

## Readme, comments, and coding style

An indicator for good source code is readability. To keep source code maintainable and readable, you should add comments to your source code where reasonable. A consistent coding style also helps a lot when tracing the source code. For this assignment, please also compose a readme file in \*.txt format and name it as "README.txt". This file should contain a brief explanation of how to use your program. Please remember to have your source code comments and readme file in English.

## Submission

To submit your files electronically, login DomJudge website through the following url: <http://domjudge.csie.io:54321>

Press the submit button and choose the homework questions you want to submit. After submitting your code, DomJudge will give you a result to tell you whether your code is correct or not. **Please note that our code will be evaluated by different sets of test cases.** Please make sure your code can work correctly based on the description above. Additionally, you must compress your code and the README file into a **zip** file and upload it to Ecourse2. Otherwise, you will get zero point.

**ATTENTION: Do NOT copy others' work or you will get a zero.**

## Grading policies

The TA(s) will mark and give points according to the following rules:

95% - Correctness of the answers.

5% - Readme, comments, and coding style.