Final Examination: Major Test

1. Leaders in an Array

Description:

You are given an array `A` of size `n`. A leader is defined as an element that is greater than or equal to all elements to its right. Your task is to find and print all such leader elements in reverse order.

Input:

First line contains an integer `n`, representing the size of the array.

Second line contains `n` space separated integers representing the elements of the array.

Output:

Print all the leader elements in reverse order, separated by a space.

Constraints:

1 ≤ n ≤ 10^6

Example:

Input:

6

3 12 34 2 0 1

Output:

1 0 2 34

2. Minimum Length Word in a String

Description:

Given a string `S` consisting of multiple words, your task is to find the word with the minimum length. If there are multiple words of the same length, return the first one.

Input:

A string `S` containing words separated by single spaces.

Output:

Print the word with the minimum length.

Constraints:

1 ≤ Length of String `S` ≤ 10^5

Example:

Input:

this is a test string

Output:

a

3. Maximum Sum Path Across Two Sorted Arrays

Description:

You are given two sorted arrays. Your task is to find a path through their intersection that produces the maximum sum. You can switch from one array to another at the common elements.

Input:

First line: Integer `M`, the size of the first array.

Second line: `M` space separated integers representing the first array.

Third line: Integer `N`, the size of the second array.

Fourth line: `N` space separated integers representing the second array.

Output:

Print the maximum sum possible.

Constraints:

1 ≤ M, N ≤ 10^6

Example:

Input:

6

1 5 10 15 20 25

5

2 4 5 9 15

Output:

81

4. Symmetrical Number Pattern

Description:

Given a number `N`, print a symmetrical number pattern based on the input.

Input:

Integer `N`, representing the number of rows.

Output:

Print the symmetrical pattern.

Example:

Input:

3

Output:

33333

32223

32123

32223

33333

5. Maximum Sum of Subarray of Size `K`

Description:

Given an array `arr` of size `N` and an integer `K`, find the subarray of size `K` that has the maximum sum.

Input:

First line: Two space separated integers, `N` (size of array) and `K` (size of subarray).

Second line: `N` space separated integers representing the array.

Output:

Print the maximum sum of any subarray of size `K`.

Constraints:

1 ≤ N ≤ 10^6

1 ≤ K ≤ N

Example:

Input:

6 2

2 7 3 6 7 7

Output:

14

6. Keyboard Faulty Key Interpretation

Description:

You are given pairs of words. The first word represents what you intended to type, and the second word is how it was interpreted by a faulty keyboard (where keys may register multiple times). Determine if the second word can be a valid interpretation of the first.

Input:

First line: Integer `N`, representing the number of word pairs.

The next `2 * N` lines contain pairs of words: the first is the intended word, and the second is the interpreted word.

Output:

For each pair, print "true" if the second word is a possible interpretation of the first, otherwise print "false".

Constraints:

1 ≤ N ≤ 10^5

1 ≤ Length of each word ≤ 10^6

Example:

Input:

2

code

cooodeee

hello

hheeeloo

Output:

true

false