DSA LAB SECTION-A

10th June, 2022 Total Marks: 10

Time Limit for all problems: 1 sec
Memory Limit for all problems: 256 megabytes

Note: Please use Stacks and Queues along with Arrays to solve the given problems. Any solution which does not use said data-structures will not be graded.

Problem 1: Reverse an Array using a Stack **Marks: 3**

Yatty, considers himself to be a pro at data structures while his friends tend to think otherwise. They ask Yatty to reverse an array of size N and value v_i where $1 <= i <= N$ using a stack.

Yatty is stuck and requires your help in implementing a stack and reversing the array. Help Yatty with this task. Print the reversed array as the solution.

Constraints

$1 <= N <= 10^5$

$10^{-9} <= v_i <= 10^9$

Input

First line of the input consists of the integer N
Second line of the input consists of the integer values v_i

Output
Print the reversed array elements as space separated integers.

Example Test Cases

Standard Input	Standard Output
5 1 3 4 2 5	5 2 4 3 1
1 1	1

Problem 2: Mario and Luigi **Marks: 3**

Luigi and Mario quietly observe the New York skyline when Luigi gives Mario a test of courage. He selects N pillars with heights H_i ($1 <= i <= N$) and asks Mario to start from any pillar and jump until the height of the j^{th} pillar is less than or equal to the height of the $(j-1)^{th}$ pillar.

As any younger brother, Luigi keeps score which is calculated as the xor of the heights of all pillars Mario has jumped in a run.

Your task is to calculate the maximum possible score which can be obtained by Mario if he starts jumping from any i^{th} pillar where $1 <= i <= N$.

Constraints

$1 <= N <= 10^5$

$1 <= H_i <= 10^9$

Input

First line of the input consists of the integer N
Second line of the input consists of the space separated integer values H_i

Output

Print a single integer, maximum possible score.

Example Test Cases

Standard Input	Standard Output
5 1 2 3 8 6	11
4 1 2 4 3	7
5 1 2 3 4 4	7

Explanation for Test Case - 1: The maximum possible score is obtained when Mario starts jumping at the third pillar and stops at the fourth, the score is $3 \oplus 8 = 11$.

Problem 3: Students vs Canteen **Marks: 4**

Aakash bhaiya decides to introduce gol-gappas of 7 flavors to the canteen menu. He carefully prepares the gol-gappas of flavors 0,1,2,3,4,5 and 6 and stacks them on a stand randomly.

The students are queued near the canteen stall and the number of students in the line equals the number of gol-gappas stacked on the stand.

Being avid gol-gappa enjoyers, every student at IIITD has his preference of gol-gappa flavor and refuses to eat anything other than his preferred flavor. So two cases arise,

1. If the student standing at the front of the queue prefers the gol-gappa flavor on the top of the stack then he/she will take the gol-gappa and leave the line.
2. Else, he/she will go to the end of the queue and wait again.

This will continue until nobody likes the gol-gappa on the top and thus nobody left in the queue is able to enjoy his/her preferred gol-gappas.

Your task is to report the number of students who are unable to enjoy their preferred gol-gappas.

Constraints

$1 <= (students.length == golgappa.length) <= 100$

$students[i],\ golgappa[i] \in \{0, 1, 2, 3, 4, 5, 6\}$

Input

First line of input is the integer N which is the length of the student/golgappa input.
Second line contains space separated integers $students[i]$
Third and final line contains space separated integers $golgappa[i]$

Output

A single integer, number of students who are unable to enjoy their preferred gol-gappas.

Example Test Cases

Standard Input	Standard Output
5 1 3 4 5 6 2 2 4 3 2	5
6 2 3 4 5 6 2 2 2 4 3 2 1	2