TA's Miskates

Project
Data Structures
Algorithms
Due date: 3 May, 2020

Problem Statement: TSA DAs have made so many mistakes in the test case for the assignments(after all, they are humans too!). But since they are smarter, this time they made those mistakes a question itself. Your task is to find that mistake. There is a Boolean array of size N and exactly one element is different from the other element. You won't be given the array explicitly, however you can make some special queries to get the element at a given valid index. You have infinite such special queries, but limited time. Find the zero-based index where the mistake is present and output it.

Note
It is guaranteed that there is exactly one mistake and there is no mistake in that! ALSO, BE EXTRA SURE OF THE INTERACTION. IT IS CASE SENSITIVE AND SPACE SENSITIVE. DO NOT PRINT ANY EXTRA LINES AND DO NOT PRINT ANY OTHER DEBUGGING STATEMENTS.

Input
First fixed line will contain T, the number of test cases. For each test case, a single integer N will be provided.

Interaction
To get the element at index i, output "READ i"(without quotes), and the OJ will return "true" or "false"(without quotes) if i is valid. Note that "true" or "false" are in string format and are the values of the boolean array. NOTE: AFTER USING cout, ALWAYS USE fflush(NULL); statement in C++. If you don't use that, there will be issues with input.

Output
Once you find the index i which differs from the rest of the elements, output "OUTPUT i"(without quotes).

Constraints
$1 \leq T \leq 10^4$
$3 \leq N \leq 10^5$
$T*$(maximum N across all test case)$\leq 10^5$

Time Limit: 3 sec
Memory Limit: 256 MB

Sample Test Case

First array	true true true true false
Second array	false false true false false
Interaction Sample 1(on the above arrays)	
2 5 true true true true false 5 false false true	READ 0 READ 1 READ 2 READ 3 READ 4 OUTPUT 4 READ 0 READ 1 READ 2 OUTPUT 2
Interaction Sample 2(on the above arrays)	
2 5 false true true 5 false false true	READ 4 READ 3 READ 2 OUTPUT 4 READ 4 READ 3 READ 2 OUTPUT 2
Interaction Sample 3(on the above arrays)	
2 5 true true false 5 false false false false true	READ 1 READ 2 READ 4 OUTPUT 4 READ 4 READ 0 READ 1 READ 3 READ 2 OUTPUT 2

Explanation

The file has 2 test cases, each with array of size 5 as given above. There is no fixed input, i.e. copy pasting the left side of table to test your code won't work.

The above three interactions are the examples of three different types of code on the same input. Be sure to stick to the format of interaction and any deviation from that(like extra space anywhere, or invalid index i etc) will result in WRONG-ANSWER.

In the first interaction, your code sequentially asks for the input from the first, and the OJ replies with the corresponding element in the array.

In the second interaction, your code sequentially asks for the input from the last, and the OJ replies with the corresponding element in the array.

In the third interaction, your code sequentially asks randomly for the input, and the OJ replies with the corresponding element in the array.