

# **Guessing Game**

This is a game between you and the contest grader. You are given an array A of N distinct integers. The grader has an array G of size N, with the rule that each value in G must appear in A as well.

This is a multirun problem, meaning that your program will be executed multiple times. In each run, you will be given the array A, an integer index, and an array B of size N - 1, which is the same as the grader's array G without the element at the position index. There will be N runs in total, each run will have a different value for the index. Your task is to correctly guess the missing element in at least one of the multiple runs.

### **Implementation Details**

Include the header file guess.h. You will be tasked with implementing the following function:

int guess(vector < int > A, int N, int index, vector < int > B);

The guess function should return your guess for the missing value from G. There won't be any data to read from standard input, and nothing should be printed to standard output. Since this is a multirun problem, it is not possible to exchange data between runs using global memory. Any attempt at doing this or similar will be considered cheating.

#### Constraints

- $2 \leq N \leq 128$
- $1 \leq A_i \leq 10^6$
- $1 \leq B_i \leq 10^6$
- $0 \leq \text{index} < N$

#### Subtasks

- (4 points) *G* is a permutation of *A*.
- (9 points) Each element in *G* appears at least twice.
- (23 points) *G* is sorted in non-decreasing order.
- (15 points) N = 2.
- (49 points) No further restrictions.

## Examples

Function Calls, with G = {4, 3, 2, 1}:												<b>Returned Values</b>
guess (	{1 <b>,</b>	2,	3,	4},	4,	Ο,	{ 3	, 2	, 1	} )		4
guess (	{1 <b>,</b>	2,	3,	4},	4,	1,	{ 4	, 2	, 1	} )		<u>3</u>
guess (	{1 <b>,</b>	2,	3,	4},	4,	2,	{ 4	, 3	, 1	} )		2
guess (	{1 <b>,</b>	2,	3,	4},	4,	3,	{ 4	, 3	, 2	} )		1
Function Calls, with G = {4, 4, 2, 2}:												
F	unct	ion	Call	s, wi	th (	G = ·	<b>{4</b> , 4	<b>, 2,</b> 2	2}:			<b>Returned Values</b>
F guess (	<b>unct</b> {19,	ion	Call	<b>s, wi</b>	i <b>th (</b>	<b>g =</b> . 4,	<b>{4, 4</b> 0 <b>,</b>	<b>,2,</b> 2	<b>2}:</b> 2,	2 }	)	Returned Values4
F guess( guess(	unct {19, {19,	2, 2,	<b>Call</b> 77 77	<b>s, wi</b> 7 , 4 7 , 4	<b>th (</b> }, },	<b>g =</b> · 4 , 4 ,	<b>{4,4</b> 0, 1,	<b>,2,</b> {4, {4,	2 <b>}:</b> 2, 2,	2 } 2 }	)	Returned Values43
F guess( guess( guess(	unct {19, {19, {19,	ion 2, 2, 2,	<b>Call</b> 77 77 77	<b>s, wi</b> 7, 4 7, 4 7, 4	<pre>ith ( }, }, }, </pre>	<b>G =</b> 4, 4, 4,	<b>{4,4</b> 0, 1, 2,	<b>; 2,</b> 2 {4, {4, {4,	<b>2}:</b> 2, 2, 4,	2 } 2 } 2 }	) ) )	Returned Values432

Note: Underlined answers are correct; at least one answer needs to be correct to get full marks.