

HOME TOP CATALOG CONTESTS GYM PROBLEMSET GROUPS RATING EDU API CALENDAR HELP

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PROBLEMS SUBMIT CODE MY SUBMISSIONS STATUS HACKS ROOM STANDINGS CUSTOM INVOCATION

F. Faculty

time limit per test: 2 seconds memory limit per test: 256 megabytes

In 2077, after the world was enslaved by robots, the robots decided to implement an educational reform, and now the operation of taking the modulus is only taught in the faculty of "Ancient World History". Here is one of the entrance tasks for this faculty:

We define the beauty of an array of positive integers b as the maximum $f(b_i,b_j)$ over all pairs $1 \le i,j \le n$, where $f(x,y) = (x \bmod y) + (y \bmod x)$.

Given an array of positive integers a of length n, output n numbers, where the i-th number ($1 \leq i \leq n$) is the <code>beauty</code> of the array a_1, a_2, \ldots, a_i .

 $x \mod y$ is the remainder of the division of x by y.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \le t \le 10^4$). The description of the test cases follows.

The first line of each test case contains a single integer n ($1 \le n \le 10^6$) — the size of the array a.

The second line of each test case contains n integers a_1, a_2, \ldots, a_n ($1 \le a_i \le 10^9$).

It is guaranteed that the sum of n across all test cases does not exceed 10^6 .

Output

For each test case, output n integers — the beauties of all prefixes of the array a.

Example

input	Сору
2	
5	
3 1 4 1 5	
7 5 11 11 4 2 1 10	
output	Сору
0 1 4 4 5	
0 6 6 7 7 7 11	

Note

The beauty of the array 3 is 0.

The beauty of the array 3, 1 is f(3, 1) = 1.

The beauty of the array 3, 1, 4 is f(3, 4) = 4.

The beauty of the array 3, 1, 4, 1 is f(4,3) = 4.

The beauty of the array 3, 1, 4, 1, 5 is f(4, 5) = 5.

Codeforces Round 1026 (Div. 2)

Finished

Practice



→ Virtual participation

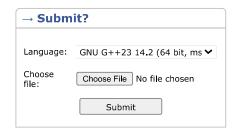
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Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest



→ Last submissions		
Submission	Time	Verdict
322399711	Jun/01/2025 16:21	Accepted
322399558	Jun/01/2025 16:20	Time limit exceeded on test 17
321124473	May/24/2025 19:00	Time limit exceeded on pretest 17



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- Announcement
- Tutorial

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