Problem B. Yet Another Convolution

Input file:	*standard input*
Output file:	*standard output*
Time limit:	6 seconds
Memory limit:	256 mebibytes

You are given an integer array $a_1, \ldots, a_n$ and an integer array $b_1, \ldots, b_n$.

You have to calculate the array $c_1, \ldots, c_n$ defined as follows:

$$c_k = \max_{\gcd(i,j)=k} |a_i - b_j|.$$

Input

The first line of input contains a single integer n ($1 \le n \le 10^5$).

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

The third line of input contains n integers $b_1, \ldots, b_n$ ($1 \le b_i \le 10^9$).

Output

Output n integers $c_1, \ldots, c_n$.

Example

standard input	standard output
8 1 2 3 4 5 6 7 8 8 7 6 5 4 3 2 1	7 5 3 3 1 3 5 7