Problem F. Gcd Product

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

Give you $n, A_{1...n}, B_{1...n}$, you need to calculate:

$$C_k = \sum_{i=1}^{k} A_{gcd(i,k)} B_{gcd(k+1-i,k)}$$

Because the output may be too large, let Ans_i denote $C_i \ mod$ 998244353, you only need to output $Ans_1 \ xor \ Ans_2 \ xor \ ... \ xor \ Ans_n$

Input

The first line has one integer n.

The second line has n integers $a_{1...n}$.

The third line has n integers $b_{1...n}$.

$1 \le n \le 5 \times 10^5$

$0 \le a_i, b_i < 998244353$

Output

Output the answer.

Example

standard input	standard output
6 1 2 3 4 5 6 6 5 4 3 2 1	88