

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 $C_i \bmod 998244353$, you only need to output $Ans_1 \text{ xor } Ans_2 \text{ xor } \dots \text{ xor } Ans_n$

Input

The first line has one integer n .

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

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

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

$$0 \leq a_i, b_i < 998244353$$

Output

Output the answer.

Example

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