# Grid Path Tree

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|---|---|
| Input file: | `standard input` |
| Output file: | `standard output` |
| Time limit: | 3 seconds |
| Memory limit: | 1024 megabytes |

You are given positive integers $N$ and $M$.

For each $k = 1, 2, \ldots, N + M - 1$, let $\mathrm{ans}_k$ denote the answer to the following problem.

A pair of sequences $(a, b)$, where $a = (a_1, a_2, \ldots, a_{N+M-1})$ and $b = (b_1, b_2, \ldots, b_{N+M-1})$, each of length $N + M - 1$, is called a **good pair of sequences** if all of the following conditions are satisfied:

- $(a_1, b_1) = (1, N + 1)$
- For $i = 2, 3, \ldots, N + M - 1$, one of the following holds:
  - $(a_i, b_i) = (a_{i-1} + 1, b_{i-1})$
  - $(a_i, b_i) = (a_{i-1}, b_{i-1} + 1)$
- $(a_{N+M-1}, b_{N+M-1}) = (N, N + M)$

For a **good pair of sequences** $(a, b)$, define a tree $T(a, b)$ as follows:

- It is a tree with $N + M$ vertices labeled from 1 to $N + M$.
- For each $i = 1, 2, \ldots, N + M - 1$, there is an edge connecting vertex $a_i$ and vertex $b_i$.

For a tree, let $\mathrm{dist}(i, j)$ be the number of edges on the simple path between vertices $i$ and $j$. The **score** of the tree is defined as the number of integer pairs $(i, j)$ such that $1 \leq i < j \leq N + M$ and $\mathrm{dist}(i, j) = k$.
Compute the sum of the **scores** of $T(a, b)$ over all **good pairs of sequences** $(a, b)$, modulo 998244353.

Compute all values $\mathrm{ans}_1, \mathrm{ans}_2, \ldots, \mathrm{ans}_{N+M-1}$, and output $\sum_{k=1}^{N+M-1} (\mathrm{ans}_k \oplus k)$, where $\oplus$ denotes the bitwise exclusive OR (XOR).

## Input

The input is given in the following format:

$N$ $M$

- $1 \leq N \leq 5 \times 10^6$
- $1 \leq M \leq 5 \times 10^6$
- All input values are integers.

## Output

Output the answer.

## Examples

| standard input | standard output |
|---|---|
| 2 2 | 14 |
| 24 167 | 21925979855 |
| 4297614 4167924 | 4162418864110099 |

## Note

In the first example, $(\mathrm{ans}_1, \mathrm{ans}_2, \mathrm{ans}_3) = (6, 4, 2)$. Therefore, the value to be output is

$$(6 \oplus 1) + (4 \oplus 2) + (2 \oplus 3) = 7 + 6 + 1 = 14.$$