NOI '17 P3 - Pool

Time limit: 3.0s **Memory limit:** 512M

There is a pool that can be modeled as a rectangular grid with width N meters and height 1001 meters. The bottom edge of the grid corresponds to a beach. Each $1m \times 1m$ square cell of the grid represents a unit of sea.

A safe area for swimming shall satisfy the following constraints:

- All cells in the pool are safe.
- Must be rectangular.
- Must be adjacent to the bottom edge (i.e. the beach).

Given that each square cell of $1m \times 1m$ has probability q to be safe (independently), and $1 - q$ probability to be not safe, find the probability such that the largest safe area for swimming is *exactly* K.

Input Specification

Input a line with four positive integers N, K, x, y where $1 \leq x < y < 998244353$. The parameter q is just $\frac{x}{y}$.

Output Specification

Output a line with an integer denoting the answer modulo 998244353: if the answer is $\frac{a}{b}$ in reduced form (i.e. a and b are coprime), then output x such that $bx \equiv a \bmod 998244353$ and $0 \leq x < 998244353$.

Input

```
10 5 1 2
```

Output

```
342025319
```

Hint

$x^{p-1} \equiv 1 \bmod p$ where p is prime and $x \in [1, p)$.

Constraints

Test case	N	K
1,2	$= 1$	≤ 1000
3	≤ 10	≤ 8
4		≤ 9
5		≤ 10
6	≤ 1000	≤ 7
7		≤ 8
8		≤ 9
9,10,11		≤ 100
12,13,14		≤ 1000
15,16	$\leq 10^9$	≤ 10
17,18		≤ 100
19,20		≤ 1000