



Museum

Mouse Stofl collected quite a few different souvenirs from his trips to IOIs and he would like to store them in a museum. A different glass cases and B different glass cupboards are available, each of which is one meter long. There is an infinite supply of every type of glass case and cupboard. The Museum is n meters long, so Stofl wants to use n cases and cupboards in total.

Additionally, Stofl would like to showcase the k meter long SOI flag. The flag can only be hung above the cases, as the cupboards reach up to the ceiling.

In how many different ways can Stofl set up the cases and cupboards in his museum?

Input

The first line of input contains the integers n, k, A, B – the length of the museum, the length of the SOI flag, the number of different cases and the number of different cupboards.

Output

Print a single integer – the number of ways in which Stofl can set up his museum modulo $10^9 + 7$.

Constraints

There are four batches of input, each worth 25 points. In all test cases $1 \leq k \leq n$ and $1 \leq A, B \leq 10^8$.

- In the first batch $n \leq 20$.
- In the second batch $n \leq 3\,000$.
- In the third batch $n \leq 10^6$.
- In the fourth batch $k \leq 350, n \leq 10^{18}$.

Examples

Input	Output
10 1 1 1	1023

There would be $2^{10} = 1024$ different possibilities of choosing cases or cupboards. But Stofl can't hang the SOI-flag if he chooses 10 cupboard, so that possibility drops out.

Input	Output
4 3 2 2	48

Input	Output
5 2 3 2	2313



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Task *museum*

Input	Output
18 4 15 62	663125127