Problem G. Rectangular City

Time limit	1000 ms
Mem limit	1048576 kB
OS	Linux

The festive season is coming and Rectangular City is going to organize N different events for N consecutive days. Rectangular City, as its name suggests, consists of $R \times C$ blocks. Each event will be hosted on a rectangular area within the city. In order to lighten-up the events, the mayor decides to spend some of the budgets to decorate K blocks on the condition that every decorated block must be used in all N events.

The city council is interested in the number of different ways to organize all N events such that it is possible to choose K different blocks to decorate. Two ways are considered different if there exists a day in which the corresponding event is hosted on a different area. Since the answer can be very large, modulo the output by $1\,000\,000\,007$.

Input

The input contains a line with four integers N, R, C, and K ($1 \leq N \leq 10^6$; $1 \leq R, C \leq 5\,000$; $1 \leq K \leq R \cdot C$).

Output

The output contains an integer representing the total number of different ways to organize all events, modulo $1\,000\,000\,007$.

Explanation

In the Sample Input, the city has 2×3 blocks, and the mayor decides to decorate 4 blocks for 2 different events (days). There are a total of 7 ways to organize the events.

```
#1   Day 1: oo.     Day 2: oo.    Decorated: **.
            oo.            oo.               **.

#2   Day 1: oo.     Day 2: ooo    Decorated: **.
            oo.            ooo               **.

#3   Day 1: .oo     Day 2: .oo    Decorated: .**
            .oo            .oo               .**

#4   Day 1: .oo     Day 2: ooo    Decorated: .**
            .oo            ooo               .**

#5   Day 1: ooo     Day 2: oo.    Decorated: **.
```

```
            ooo           oo.               **.

  #6   Day 1: ooo     Day 2: .oo    Decorated: .**
            ooo           .oo               .**

  #7   Day 1: ooo     Day 2: ooo    Decorated: **.
            ooo           ooo               **.
```

Note that, in the example above, configuration #7 uses the whole city for both events, thus, the decorated blocks can be any K blocks in the city. The shown decorated blocks are only given as examples.

Sample 1

Input	Output
2 2 3 4	7