



Romanian Master of Informatics

4th Edition, Bucharest, 20th -23rd October 2016

Image

Fourier has an image of $M \times N$ pixels (M lines, N columns). All the pixels are initially white. Fourier wants to color some pixels in black in order to obtain an amazing image. He considers an image to be amazing if, in any contiguous group of K pixel columns, there exists at least one column containing at least F black pixels.

Task

Fourier is very curious about how many possibilities he has for coloring the image and he asks you to calculate this for him.

Input data

The file **image.in** contains a single line with four integers, M N K F , with the meanings described above.

Output data

The file **image.out** must contain a single integer representing the number of amazing images modulo 1,000,000,007.

Limits and constraints

- $1 \leq K \leq N$
- $1 \leq F \leq M$
- Time limit: 0.6 seconds
- Memory limit: 256 MB

Subtasks

Test cases will be scored **in groups**.

Subtask	Percentage of test cases	Additional input constraints
1	10%	$M \times N \leq 20$
2	20%	$N \times K \leq 10,000,000$ $M \leq 20$
3	30%	$N \leq 10,000,000$ $M \leq 20$
4	40%	$N \leq 1,000,000,000$ $K \leq 100$ $M \leq 20$



Romanian Master of Informatics

4th Edition, Bucharest, 20th -23rd October 2016

Example

image.in	image.out
2 6 2 2	217
2 6 2 1	3105