interestring

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

When Dictator S is not busy silencing his political opponents, he likes to play games with Assistant Y. Specifically, they enjoy playing with strings. That is why Dictator S always sends his best helpers on the lookout for *interesting* strings.

A string is a linear sequence of characters. Assistant Y likes strings of length N, so that is what Dictator S is searching for. And obviously, all strings must be in the local alphabet. The alphabet has size M and letters are numbered in order from 1 to M. Moreover, **the alphabet is cyclic**. This means that the letter numbered 1 is 1 letter after the letter numbered M.

Dictator S is skilled at counting forwards in the alphabet and dislikes it when he reaches a letter too quickly from another letter. Hence, a string T is *bad* if, for all ordered pairs of adjacent letters (T_i, T_{i+1}), the letter T_{i+1} is at most H letters after the letter T_i in the alphabet. Note that all strings of length 1 are *bad*. Then, a string U is *interesting* if the length of the longest *bad* substring of U is at most K. A substring of U is defined as one or more consecutive characters in the string U.

As one of Dictator S's trustiest helpers, you have been assigned the extremely essential role of calculating the number of *interesting* strings of length N, modulo $10^9 + 7$.

Input

The first and only line of input contains 4 integers N, M, H and K ($1 \leq K \leq N \leq 2 \cdot 10^5$, $0 \leq H < M \leq 2 \cdot 10^5$).

Output

Output a single integer representing the number of *interesting* strings, modulo $10^9 + 7$.

Scoring

Subtask	Score	N	M	Additional constraints
1	5	-	-	$K = 1$
2	5	$1 \leq N \leq 7$	$1 \leq M \leq 7$	-
3	18	$1 \leq N \leq 50$	$1 \leq M \leq 50$	-
4	10	$1 \leq N \leq 5000$	$1 \leq M \leq 5000$	$H = 0$
5	20	$1 \leq N \leq 5000$	$1 \leq M \leq 5000$	-
6	10	-	-	$H = 0$
7	32	-	-	-
8	0	Sample Testcases		

Examples

standard input	standard output
3 3 1 2	15
5 4 0 1	324

Note

For the first sample testcase, let numbers from 1 to $M = 3$ represent letters of the alphabet. Then, the *interesting* strings are: `113, 121, 131, 132, 133, 211, 212, 213, 221, 232, 313, 321, 322, 323, 332`.