

Contest Duration: 2025-04-12(Sat) 22:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250412T2100&p1=248>) - 2025-04-12(Sat) 23:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250412T2240&p1=248>) (local time) (100 minutes)

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C - K-bonacci

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 300 points

Problem Statement

You are given positive integers N and K . Define a sequence $A = (A_0, A_1, \dots, A_N)$ of length $N + 1$ as follows:

- $A_i = 1$ for $0 \leq i < K$;
- $A_i = A_{i-K} + A_{i-K+1} + \dots + A_{i-1}$ for $K \leq i$.

Find A_N modulo 10^9 .

Constraints

- $1 \leq N, K \leq 10^6$
- All input values are integers.

Input

The input is given from Standard Input in the following format:

`N K`

Output

Print the answer.

Sample Input 1

[Copy](#)

4 2

[Copy](#)

Sample Output 1

[Copy](#)

5

[Copy](#)

We have $A_0 = A_1 = 1$, and $A_2 = A_0 + A_1 = 2$, $A_3 = A_1 + A_2 = 3$, $A_4 = A_2 + A_3 = 5$.

Sample Input 2

[Copy](#)

10 20

[Copy](#)

Sample Output 2

[Copy](#)

1

[Copy](#)

Sample Input 3

[Copy](#)

1000000 500000

[Copy](#)

Sample Output 3

[Copy](#)

420890625

[Copy](#)

Remember to print A_N modulo 10^9 .

'#telegram)

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