C - K-bonacci

Editorial (/contests/abc401/tasks/abc401_c/editorial)

Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 300 points

Problem Statement

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

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

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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.

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