Savings

Time Limit: 1.0s **Memory Limit:** 256M

Sylva and Müko have a $\mathbf{N} \times \mathbf{M}$ chessboard which they use as a piggy bank. Rows are numbered from 0 to $\mathbf{N} - 1$ and columns -- from 0 to $\mathbf{M} - 1$. Sylva uses white cells for his savings while Müko uses black ones (the cell at row 0 and column 0 is white). Currently the cell at row r and column c contain $r \; xor \; c$ coins. Here xor is a bitwise exclusive or operation.

Because of coronavirus in order to make a living the guys have to take $\mathbf{K}$ coins out of each board cell (if a cell contains less than $\mathbf{K}$ coins they take everything from it). Then they need to calculate a savings balance which is a difference between the number of Sylva's coins and the number of Müko's coins. Your task is to help them to find the balance value modulo 1000000007 $(10^9 + 7)$.

Input

The only line contains three integers $\mathbf{N}$, $\mathbf{M}$, and $\mathbf{K}$.

- $1 \leq \mathbf{N}, \mathbf{M} \leq 10^{18}$,
- $0 \leq \mathbf{K} \leq 10^{18}$.

Output

The savings balance modulo 1000000007.

Examples

Input 1:

```
5 3 3
```

Output 1:

```
2
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