Power

2022/2023 SEASON – SECOND ROUND

You and your classmate Denislav have received for homework in informatics to make a project to solve the following problem:

"Let a, b_0, c, d, n be given natural numbers. We create the sequence $b_1, b_2, \ldots, b_n$ according to the rule $b_i = (b_{i-1} * c + d)\ mod\ 2^{32}$. Let $v_i = a^{b_i}\ mod\ 2^{32}$, where *mod* denotes the remainder of division.

Find $v_1 \hat{} v_2 \hat{} \ldots \hat{} v_n$, where ^ denotes the bitwise exclusive or operation."

Unfortunately, your classmate is too busy chatting with his girlfriend, so the implementation part of the project is left to you.

Input

The first and only line of the file **power.in** contains the numbers a, b_0, c, d, n.

Output

On the only line of the file **power.out**, print the required value.

Constraints

$1 \leq n \leq 10^7$

$1 \leq a, b_0, c, d < 2^{32}$

Time limit: 0.2 sec.
Memory limit: 256 MB.

Sample test

Input (power.in)	**Изход (power.out)**
3 5 7 9 11	2510761843