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 $b\_{1}, b\_{2}, … , b\_{n}$ according to the rule

$b\_{i}=\left(b\_{i-1}\*c+d\right) mod 2^{32}$. Let $v\_{i}=a^{b\_{i}} mod 2^{32}$, where [*mod*](https://en.wikipedia.org/wiki/Modulo_operation) denotes the remainder of division.

Find $v\_{1}\^v\_{2}\^...\^v\_{n}$, where [*^*](https://en.wikipedia.org/wiki/Exclusive_or) 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 |