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

"Let be given natural numbers. We create the sequence according to the rule

. Let , where [*mod*](https://en.wikipedia.org/wiki/Modulo_operation) denotes the remainder of division.

Find , 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.

**Output**

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

**Constraints**

**Time limit: 0.2 sec.**

**Memory limit: 256 MB.**

**Sample test**

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