Negative base

Have you ever heard of base-2 (binary) numbers?

Well, of course you did!!! You are a computer scientist.

How about base-(-2) numbers? Yes, you read it right we are talking about a base that is negative!!!

An integer *n* writte in in base-(-2) is a sequence of bits (`b_i`), written right to left. Each of which is either `0` or `1` (no negative bits are allowed) and the following must hold:

```
n = b_0 + b_1 * (-2) + b+2 * (-2)^2 + b_3 * (-2)^3 + ...
```

Every integer in base-10 has a unique representation in base-(-2) and no negative signs are ever needed.

Your task is to write a program that given a number in base-10 finds its base-(-2) representation.

Input

The number in base-10, -1,000,000,000 <= N <= 1,000,000,000.

Output

The corresponding number in base-(-2) with no leading zeros.

Example 1

```
Input:
1
Output:
1
```

Example 2

```
Input:
7
Output:
11011
```

Example 3

```
Input:
-2
Output:
10
```

Example 4

```
Input:
0
Output:
0
```