1189 - Skew Binary

Description

When a number is expressed in decimal, the k^{th} digit represents a multiple of 10^k. (Digits are numbered from right to left, where the least significant digit is number 0) For example: 81307(10) = 8 * 10^4 + 1 * 10 ^3 + 3 * 10^2 + 0 * 10^1 + 7 * 10^0 = 80000 + 1000 + 300 + 0 + 7 = 81307. When a number is expressed in binary, the k^{th} digit represents a multiple of 2^k. For example: 10011(2) = 1 * 2^4 + 0 * 2^3 + 0 * 2^2 + 1 * 2^1 + 1 * 2^0 = 16 + 0 + 0 + 2 + 1 = 19. In skew binary, the k^{th} digit represents a multiple of 2^(k+1)-1. The only possible digits are 0 and 1, except that the least-significant nonzero digit can be a 2. For example: 10120(skew) = 1 * (2^5-1) + 0 * (2^4-1) + 1 * (2^3-1) + 2 * (2^2-1) + 0 * (2^1-1) = 31 + 0 + 7 + 6 + 0 = 44. The first 10 numbers in skew binary are 0, 1, 2, 10, 11, 12, 20, 100, 101, and 102. (Skew binary is useful in some applications because it is possible to add 1 with at most one carry. However, this has nothing to do with the current problem.)

Input specification

The input contains one or more lines, each of which contains an integer n. If n = 0 it signals the end of the input, and otherwise n is a nonnegative integer in skew binary.

Output specification

For each number, output the decimal equivalent. The decimal value of n will be at most 2^31-1 = 2147483647.

Sample input

```
10120
20000000000000000000000000000
10
10000000000000000000000000000
11
100
```

```
11111000001110000101101102000
0
```

Sample output

```
44
2147483646
3
2147483647
4
7
1041110737
```

Hint(s)

Source	ACM-ICPC Mid-Central - USA - 1997
Added by	**ejaltuna**
Addition date	2011-10-13 08:09:11.0
Time limit (ms)	1000
Test limit (ms)	1000
Memory limit (kb)	131072
Output limit (mb)	64
Size limit (bytes)	100000
Enabled languages	C C# C++ Java Pascal Perl PHP Python Ruby Text