

## Converting Decimal Numbers to Leutonian

Instead of binary or decimal, the Kingdom of Leutonia uses an unusual system to represent numbers, based on the Fibonacci sequence. The Fibonacci sequence  $F_0, F_1, F_2, \dots$  is defined recursively as follows.

$$\begin{aligned}F_0 &= 1 \\F_1 &= 1 \\F_n &= F_{n-1} + F_{n-2} \text{ for } n \geq 2\end{aligned}$$

A Leutonian number is a string of 0's and 1's that begins with a 1 and never has two consecutive 1's. If  $s = s_\ell s_{\ell-1} \dots s_1$  is such a string of length  $\ell$ , where each  $s_i$  is in  $\{0, 1\}$ , the number represented by  $s$  is  $\sum_{i=1}^{\ell} s_i \cdot F_i$ .

For example, the number represented by 1000101 is  $F_7 + F_3 + F_1 = 21 + 3 + 1 = 25$ .

### Input

The input will be a list of positive integers, one per line. The last line (which should not be processed) will contain 0.

### Output

For each number given in the input, output the Leutonian representation of the number. Each Leutonian number that you will have to output will be at most 25 characters long. Each Leutonian number should appear on a separate line.

### Sample Input

```
2
25
0
```

### Sample Output

```
10
1000101
```