Problem F- Binary

0110111001011101111
1000100110101011100
11011110111110000100011О
0101001110100101011011 01
0111110001100111010110111 1100
111011111011111100000100001......

You've just discovered that any number can be written in binary representation and decided to convert as many numbers as you can into binary and write them down. You started with 0, then wrote 1, 10, 11, 100, and so on (you did not put spaces or commas between the numbers). At around 10000 you decided that it is too boring and should be automated, so you are going to write a computer program that will help you: it will produce the k^{th} digit of the binary sequence.

Input Specification:

There will be multiple test cases (at most 10000). Each test case will be represented by a single integer, k ($0 \leq k \leq 10^9$). All integers in the input will be separated by spaces and/or new lines. Input will be terminated by the end of file.

Output Specification:

For each test case, output the k^{th} character of the binary sequence (indexing starts with 0), on a line by itself.

Sample Input:

```
0 1 2 3 4
5 6 7
1000000000
```

2^2 - 2^4

Sample Output:

```
0
1
1
0
1
1
1
0
0
```