

We define the operation of splitting a binary number  $n$  into two numbers  $a(n), b(n)$  as follows. Let  $0 \leq i_1 < i_2 < \dots < i_k$  be the indices of the bits (with the least significant bit having index 0) in  $n$  that are 1. Then the indices of the bits of  $a(n)$  that are 1 are  $i_1, i_3, i_5, \dots$  and the indices of the bits of  $b(n)$  that are 1 are  $i_2, i_4, i_6, \dots$ .

For example, if  $n$  is 110110101 in binary then, again in binary, we have  $a = 010010001$  and  $b = 100100100$ .

## Input

Each test case consists of a single integer  $n$  between 1 and  $2^{31} - 1$  written in standard decimal (base 10) format on a single line. Input is terminated by a line containing '0' which should not be processed.

## Output

The output for each test case consists of a single line, containing the integers  $a(n)$  and  $b(n)$  separated by a single space. Both  $a(n)$  and  $b(n)$  should be written in decimal format.

## Sample Input

```
6
7
13
0
```

## Sample Output

```
2 4
5 2
9 4
```

