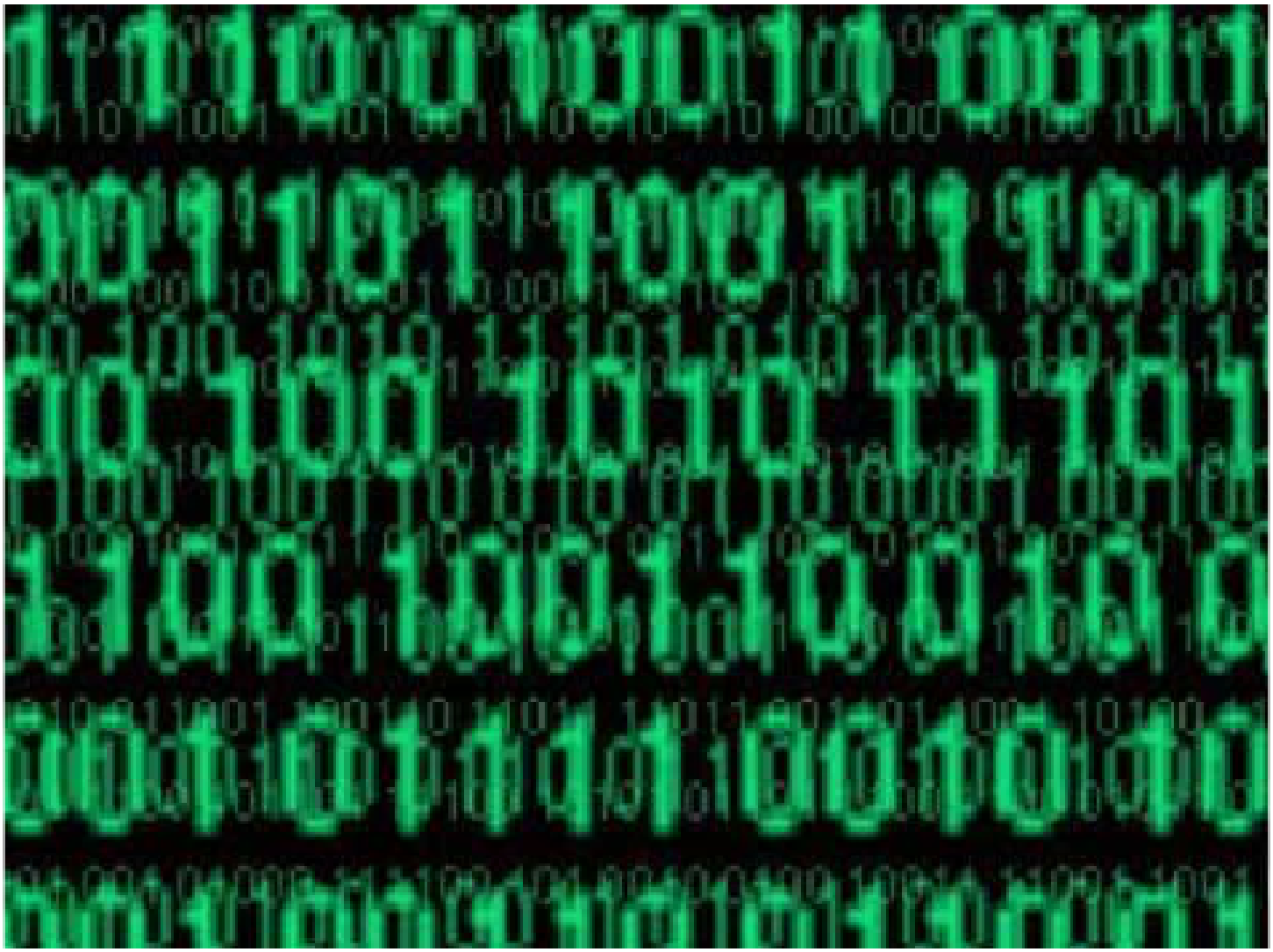
Splitting Numbers

We define the operation of splitting a binary number n into two numbers a(n), b(n) as follows. Let $0 \leq i_1 < i_2 < \ldots < i_k$ 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,... and the indices of the bits of b(n) that are 1 are i_2, i_4, i_6,...



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
```