

11933 Splitting Numbers

We define the operation of splitting a binary number n into two numbers $a(n), b(n)$ as follows. Let $0 \leq i_1 < i_2 < \dots < i_k$ 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
```