COCI '09 Contest 7 #2 Cokolada

Time limit: 0.6s **Memory limit:** 32M

A new type of chocolate arrived in the local shop. The chocolate comes in bars, each bar consisting of N squares. Bars are factory made and only come in sizes which are full powers of two. In other words a single bar has $1, 2, 4, 8, 16, \ldots$ squares.

To fully assess the quality of chocolate Mirko must sample at least K squares. His friend Slavko would also like to try some of the chocolate. Since Mirko is in a hurry to try the chocolate himself, he decides to break the bar he bought in pieces, such that he has **exactly** K squares, and leaves the rest (if any) to Slavko. The bars are a bit brittle, so Mirko can break them only on their exact center. In other words, from one bar with D squares, he can get two bars with $\frac{D}{2}$ squares.

Write a program that will determine the **minimal number of breaks** Mirko must perform in order to obtain exactly K **squares** (not necessarily in one piece). Also, determine the smallest bar size Mirko must buy in order to have at least K squares.

Input Specification

The first and only line of input will contain one integer K $(1 \leq K \leq 1\,000\,000)$, the number of squares Mirko must sample.

Output Specification

The first and only line of output should contain two integers, separated by a single space. The first integer is the smallest bar size Mirko must buy. The second the smallest number of breaks.

Sample Input 1

```
6
```

Sample Output 1

```
8 2
```

Sample Input 2

```
7
```

Sample Output 2

```
8 3
```

Sample Input 3

```
5
```

Sample Output 3

```
8 3
```