

# H

## Making Quadrilaterals

Input: Standard Input  
Output: Standard Output



A quadrilateral is a simple geometric shape. The formal definition of Quadrilateral for this problem can be given as

*"A quadrilateral is a simple polygon with four sides, having a strictly positive area."*



If you are given four rods made of steel and having integer length, you may or may not be able to make a quadrilateral with it. For example you cannot make a quadrilateral with four rods of length 4, 5, 8 and 17 units but you can make a quadrilateral with four rods of length 2, 3, 4 and 5 units respectively. Now you have to supply  $n$  rods to the Architecture department of a University. But the University authority has asked you to make the length of the rods such that no four of them can be used to make a Quadrilateral. They are afraid that if the students can make such shapes then they will use up some of the rods in the sculptures they make. Given the value of  $n$ , what is the minimum possible length of the

longest rod? You can assume that:

1. Only one rod has to be used as one side of the Quadrilateral.
2. A rod cannot be divided into two smaller pieces.
3. Two or more rods cannot be joined to make a longer rod.

### Input

The input file contains around 100 line of input. Each line contains an integer, which denotes the value of  $n$  ( $3 < n < 61$ ). A line containing a 0 (zero) terminates the input.

### Output

For each line of input produce one line of output. This line contains serial of output followed by a decimal integer that denotes the shortest possible length of longest rod. You can safely assume that this length will fit in a 64-bit signed integer. Look at the output for sample input for details.

### Sample Input

```
4
6
0
```

### Output for Sample Input

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Case 1: 3
Case 2: 9
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Illustration of first Sample Input: If you have four sticks of length 1, 1, 1 and 3 then you cannot make a quadrilateral with them. So when  $n=4$ , the minimum possible length of the longest rod is 3.

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