An Odd Sum[1] (prob1)

The Problem

Some numbers such as 40 can be written as the sum of consecutive integers. For example,

$$40 = 6 + 7 + 8 + 9 + 10.$$

Shiflett and Shultz [1] defined *odd-summing* natural numbers as "natural numbers that are the sum of two or more consecutive [positive] odd numbers." Perfect squares (larger than one) are always odd-summable, while primes will not be. If a number is odd-summable, there may be more than one way to express it in that manner. For example,

$$40 = 19 + 21 = 7 + 9 + 11 + 13$$

For any odd summable number n, you are to enumerate all the sets of consecutive odd positive integers that sum to the given number n.

Input

The first line of input will be the number of problems. The remaining lines will contain one number n, $1 \leq n \leq 10^9$ per line.

Output

For each problem, output one line for each solution for a number in the input set. On the line, first have the original number, followed by a colon and a space. Then have the set of consecutive odd integers whose sum is n. Output the endpoints of each set as shown in the sample output.

When multiple solutions exist, output them sorted by the first term. If no solution exists for a given n, output a single line with "impossible" instead of the set.

Sample Input

```
3
7
35
400
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Sample Output (corresponding to sample input)

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7: impossible
35: [3, 11]
400: [1, 39]
400: [31, 49]
400: [43, 57]
400: [97, 103]
400: [199, 201]
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[1]**Adapted from *An Odd Sum* by Ray C. Shiflett and Harris S. Shultz and published in The Mathematics Teacher, Vol. 95, No. 3 (March 2002), pp. 206-209**