

4584 Ordered Pairs and Positive Integers

Any positive integer x can be represented by an ordered pair (a, b) such that $0 < a \leq b$ and

$$x = \sum_{k=a}^b k$$

The ordered pair (x, x) is the trivial representation of x . A positive integer however may have more than one representation. For example, the number 9 has three representations: $(2, 4)$, $(4, 5)$ and $(9, 9)$. Observe that $9 = 2 + 3 + 4$ and $9 = 4 + 5$.

Your task is to write a program that determines all the ordered pair representations of a given positive integer x . The program should terminate immediately if $x \leq 0$ or $x > 100,000,000$.

Input

The input consists of several input lines. Each input line consists of an integer x .

Output

For each input line consisted by x , output the number x , a colon, the number of positive pairs, another colon, followed by all the ordered pair representations of input x . Separate the ordered pairs by a space.

Sample Input

```
1
9
123
0
```

Sample Output

```
1 : 1 : (1,1)
9 : 3 : (2,4) (4,5) (9,9)
123 : 4 : (18,23) (40,42) (61,62) (123,123)
```