D. Spongebob and Squares

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Spongebob is already tired trying to reason his weird actions and calculations, so he simply asked you to find all pairs of n and m, such that there are exactly x distinct squares in the table consisting of n rows and m columns. For example, in a 3×5 table there are 15 squares with side one, 8 squares with side two and 3 squares with side three. The total number of distinct squares in a 3×5 table is $15 + 8 + 3 = 26$.

Input

The first line of the input contains a single integer x ($1 \le x \le 10^{18}$) — the number of squares inside the tables Spongebob is interested in.

Output

First print a single integer k — the number of tables with exactly x distinct squares inside.

Then print k pairs of integers describing the tables. Print the pairs in the order of increasing n, and in case of equality — in the order of increasing m.

Examples

input
26

output
6 1 26 2 9 3 5 5 3 9 2 26 1

input
2

output
2 1 2 2 1

input
8

output
4 1 8 2 3 3 2 8 1

Note

In a 1×2 table there are 2 1×1 squares. So, 2 distinct squares in total.

In a 2×3 table there are 6 1×1 squares and 2 2×2 squares. That is equal to 8 squares in total.