Subway

Time limit: 1 second
Memory limit: 256 MB

Given an integer number K, generate a tree with minimum number of nodes such that there are exactly K pairs of nodes (X, Y), where X is an ancestor of Y.

Input
The input (from the console) will contain a single integer number, K – the number of pairs with the specified property.

Output
The output (to the console) will contain N+1 lines, representing the generated tree, the nodes being indexed from 0.

The first line will contain the number N – the number of nodes in the tree.

The following N lines will contain each 2 numbers X and T, separated by a space, with the following meaning: node T is the direct ancestor of node X. If node X doesn't have a direct ancestor, T will have value -1.

Constraints

Subtask	Score	Restrictions
1	20 points	$0 \leq K \leq 50$
2	30 points	$0 \leq K \leq 500$
3	50 points	$0 \leq K \leq 10^9$

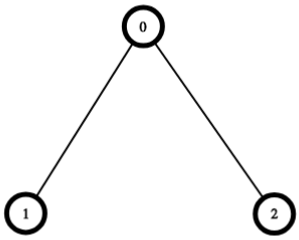
For every test, you will get:

1. 100% points if $N_{participant} = N_{committee}$
2. 80% points if $N_{participant} \in [N_{committee} + 1, N_{committee} + 2]$
3. P% points if $N_{participant} \geq N_{committee} + 3$, unde $P = \frac{N_{committee}+3}{N_{participant}} * 50$

Note: $N_{committee}$ is the minimum number of nodes that a tree with the specified property can be generated with.

EXEMPLES

Input (from the console)	*Output (to the console)*
2	3 0 -1 1 0 2 0

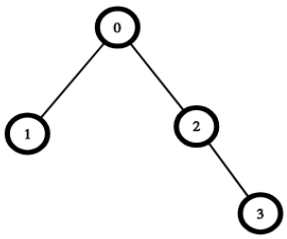


Details:

There are 2 pairs (X, Y), such that X is the ancestor of Y:

1. (X,Y) = (0, 1)
2. (X,Y) = (0, 2)

Input (from the console)	*Output (to the console)*
4	4 0 -1 1 0 2 0 3 2



Details:

There are 4 pairs (X, Y), such that X is the ancestor of Y:

1. (X,Y) = (0, 1)
2. (X,Y) = (0, 2)
3. (X,Y) = (0, 3)
4. (X,Y) = (2, 3)