Tiling Madness (`tiling`)

You want to cover a $N \times N$ grid with N non-overlapping identical $2N$-minoes.

The $2N$-minoes are not required to be entirely inside the $N \times N$ grid.

More formally, every solution to this problem must fix a $2N$-mino, and then place N copies of it on a grid (without rotating or reflecting it) so that:
- every cell of the grid is part of at most one of the $2N$-minoes.
- there exists an $N \times N$ subgrid entirely covered by the $2N$-minoes.

A $2N$-mino is a connected set of $2N$ squares; you can find an example of a valid and of an invalid $2N$-mino in Figure 1.
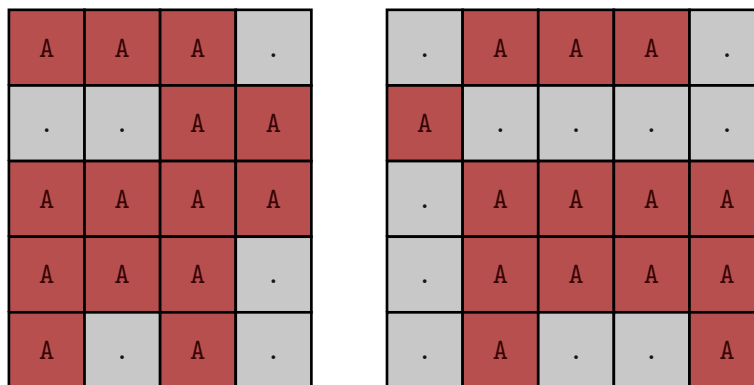

Figure 1: The figure on the left is a valid 14-mino. The one on the right is not since it is not connected.

We want to know many ways to tile the grid, each of which uses a **unique** $2N$-mino; your score will depend on how many valid $2N$-minoes that tile the $N \times N$ square you provide.

Note that $2N$-minoes that can be obtained from each other by rotation or reflection are considered **distinct**.

Implementation

This is an output-only task. You will have to submit exactly one output file.

Input format

The only input file consists of a single line, containing the integer N.

Output format

The only output file should be in the following format:
- The first line should contain a single integer C ($0 \le C \le 16000$): the number of different solutions contained in your output.
- Then C solution blocks should follow. Each block should be in the following format:
  ▸ The first line should contain two integers h and w ($0 \le h, w \le 5N$): the height and the width of the grid where you are going to place the $2N$-minoes in.
  ▸ The next h lines should each contain a string of length w, made up of the first N uppercase letters of the latin alphabet and the dot (`.`) character. The i-th letter of the alphabet indicates that the cell is occupied by the i-th copy of the $2N$-mino, while the dot indicates that the cell is left empty.

For each solution block, the grid must contain a $N \times N$ sub-grid that doesn't contain any . character. All the N copies of the $2N$-mino must be identical.

Scoring

This task has exactly 1 test case, where $N = 7$. The score S for your solution is determined according to the following table. Between the values specified in the table, the score will be assigned by **linear interpolation**. A malformed output always scores zero points.

Solutions	Score
0	0
4	10
30	30
250	50
2000	70
16000	100
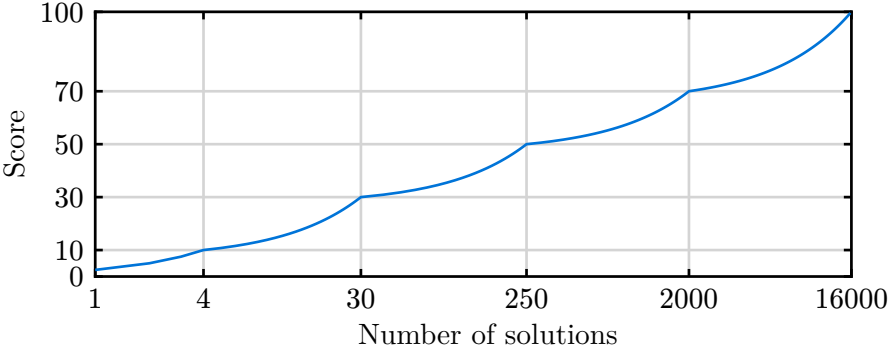
Examples

input	output
3	2
	5 6
	.AAA..
	.AAA..
	BBBCCC
	BBBCCC
	......
	5 7
	BB.....
	.BBB...
	CCBAA..
	.CCCAAA
	..C..A.

Explanation

In **the sample case** we are asked to use 6-minoes to cover a 3×3 square: note that this is not a valid input, since in the only input $N = 7$.

The output shows two of the many possible solutions, shown in the image below.
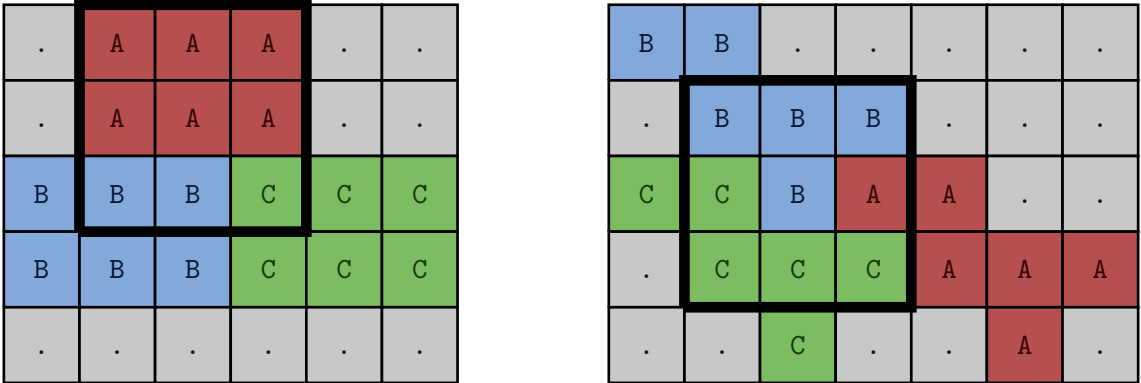
In both cases, we can see that there are 3 identical non overlapping 6-minoes and that a 3×3 square is covered.