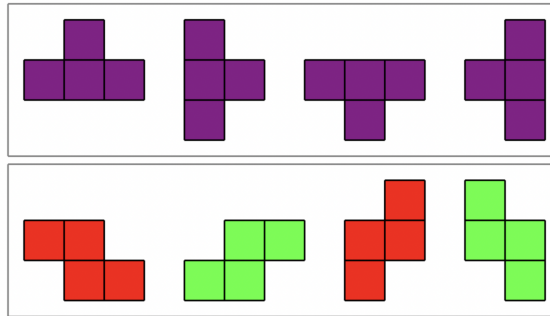


Tetris Tiling (tetristiling)

You are given an integer N . You also have an empty $N \times N$ grid of cells, on top of which you can add tetris pieces in the following way:

1. Select 4 cells from the grid which correspond to one of the following 8 shapes:



Available pieces

2. If all 4 selected cells are empty, then a new tetris piece is placed on top of them.

Any grid obtained through these operations starting from an empty grid is called a *tetris tiling*. Find any $N \times N$ tetris tiling which uses the **maximum** possible number of pieces.

🔗 Among the attachments of this task you may find a template file `tetristiling.*` with a sample incomplete implementation.

Input

The first and only line of input contains a single integer N , the size of the grid.

Output

First, output one line containing one integer indicating the maximum number of tetris pieces that can be placed on an $N \times N$ grid.

Then, output N lines, each containing N space-separated integers. The j -th integer of the i -th line is denoted by $A_{i,j}$.

If $A_{i,j} > 0$ then the cell in row i and column j belongs to piece $A_{i,j}$. Otherwise, if $A_{i,j}$ is 0, the corresponding cell is empty and does not belong to any piece.

If there are multiple solutions which maximizes the number of pieces in the tiling, output any of them.

Constraints

- $1 \leq N \leq 1000$.

Scoring

Your program will be tested against several test cases. **The score of a submission is the sum of the scores across all correctly solved test cases.**

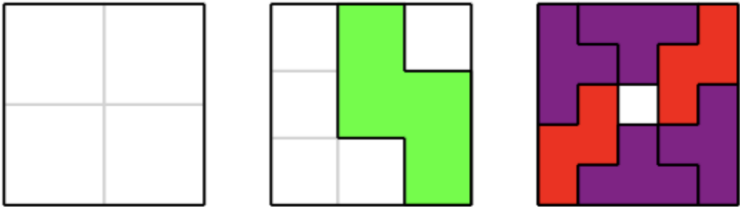
There are 40 test cases, each worth 2.5 points. The first 10 test cases belong to Subtask 1, the next 10 test cases belong to Subtask 2, and the last 20 test cases belong to Subtask 3.

- **Subtask 1** (25 points) $N \leq 10$.
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- **Subtask 2** (25 points) $10 < N \leq 20$.
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- **Subtask 3** (50 points) $20 < N$.
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Examples

input	output
2	0 0 0 0 0
3	1 0 1 0 0 1 1 0 0 1
5	6 1 2 2 2 3 1 1 2 3 3 1 6 0 3 4 6 6 5 4 4 6 5 5 5 4

Explanation



The tetris tilings in the examples.

It can be proven that for these values of N , there are no tetris tilings that use more pieces than the ones depicted above.