

SWE2004: Principles in Programming(Spring 2014)

Lab #13

Due-date: June 12, 14:45 PM

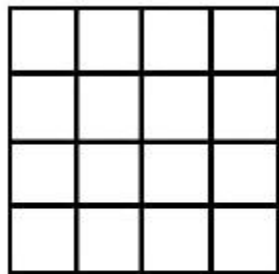
Q&A: jminlee at csl.skku.edu

Description

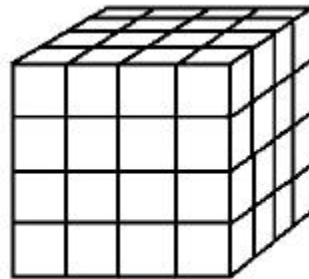
How many squares and rectangles are hidden in the 4×4 grid below? Maybe you can count it by hand for such a small grid, but what about for a 100×100 grid or even larger?

What about higher dimensions? Can you count how many cubes or boxes of different size there are in a $10 \times 10 \times 10$ cube, or how many hypercubes and hyperboxes there are in a four-dimensional $5 \times 5 \times 5 \times 5$ hypercube?

Your program needs to be efficient, so be clever. You should assume that squares are not rectangles, cubes are not boxes, and hypercubes are not hyperboxes.



A 4×4 Grid



A $4 \times 4 \times 4$ Cube

Input

The input contains one integer N ($0 \leq N \leq 100$) in each line, which is the length of one side of the grid, cube, or hypercube. In the example above $N = 4$. There may be as many as 100 lines of input.

Output

For each line of input, output six integers $S_2, R_2, S_3, R_3, S_4, R_4$ on a single line, where S_2 denotes the number of squares and R_2 the number of rectangles occurring in a two-dimensional ($N \times N$) grid. The integers S_3, R_3, S_4, R_4 denote similar quantities in higher dimensions.

Sample Input

1
2
3

Sample Output

1 0 1 0 1 0
5 4 9 18 17 64
14 22 36 180 98 1198