

## Problem 3. SUDOKU

Sudoku is a popular newspaper puzzle consisting of a  $9 \times 9$  grid. The grid is divided into nine  $3 \times 3$  “blocks”. Each cell in the grid contains either a blank spot or a digit from 1-9. The goal is to fill in the blank spots so that each row, column, and block contain one of each digit. An example puzzle and solution is presented below.

5	3			7					5	3	4	6	7	8	9	1	2
6			1	9	5				6	7	2	1	9	5	3	4	8
	9	8					6		1	9	8	3	4	2	5	6	7
8				6				3	8	5	9	7	6	1	4	2	3
4			8		3			1	4	2	6	8	5	3	7	9	1
7				2				6	7	1	3	9	2	4	8	5	6
	6					2	8		9	6	1	5	3	7	2	8	4
			4	1	9			5	2	8	7	4	1	9	6	3	5
				8			7	9	3	4	5	2	8	6	1	7	9

Source: Wikimedia Commons

Your task is to write a program that will solve any given sudoku puzzle.

### Input

The input will always consist of nine lines, each representing a row of the sudoku puzzle. Each line will contain nine integers, each between 0 and 9 (inclusive). The 0s represent the blank cells in the puzzle. It is guaranteed that there is a way to complete this partially filled grid satisfying the constraints. Unlike the puzzles you find in the newspaper, the puzzles here are randomly generated, and may have more than one solution.

### Output

Output nine lines, with each line containing the corresponding row of the solution to the puzzle and each cell separated by a space. If multiple solutions exist, you should output the one which fills the first blank with a smaller number. If the first blank is the same number for both, then you should choose the solution which fills the second blank with a smaller number and so on. Note: The “first” blank refers to the topmost and leftmost blank. Thus, in the example above, the 4 is in the first blank, the 6 in the second, the 8 in the third, and so on.

### Example

standard input	standard output
0 0 0 0 0 7 0 0 3	1 2 4 5 6 7 8 9 3
0 0 0 0 0 0 0 0 0	3 5 6 1 8 9 2 7 4
0 0 0 0 0 0 0 0 0	7 8 9 2 3 4 5 1 6
0 0 0 0 0 0 1 4 0	2 3 5 6 7 8 1 4 9
0 0 0 0 0 1 7 0 0	4 6 8 9 2 1 7 3 5
0 1 0 0 4 0 0 0 0	9 1 7 3 4 5 6 2 8
0 0 0 0 0 0 3 0 0	5 4 1 7 9 6 3 8 2
0 0 0 0 5 2 9 0 0	8 7 3 4 5 2 9 6 1
0 0 0 0 0 0 0 0 0	6 9 2 8 1 3 4 5 7