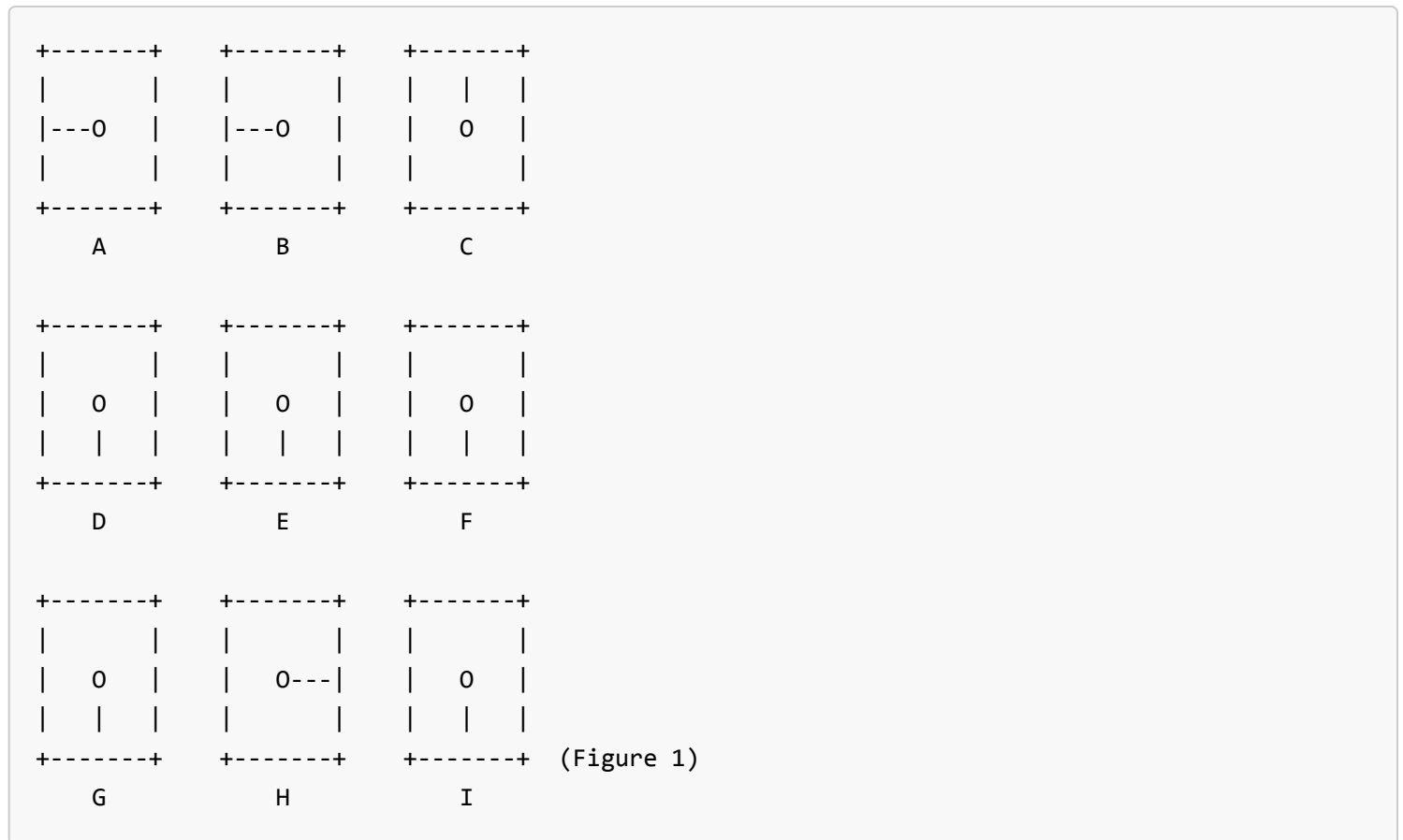


IOI '94 P4 - The Clocks

Time limit: 0.6s Memory limit: 16M

IOI '94 - Haninge, Sweden



There are nine clocks in a 3×3 array (figure 1). The goal is to return all the dials to 12 o'clock with as few moves as possible. There are nine different allowed ways to turn the dials on the clocks. Each such way is called a move. Select for each move a number 1 to 9. That number will turn the dials 90 degrees clockwise on those clocks which are affected according to figure 2 below.

Move	Affected clocks
1	ABDE
2	ABC
3	BCEF
4	ADG
5	BDEFH
6	CFI
7	DEGH
8	GHI
9	EFHI (Figure 2)

Input Specification

The input gives nine numbers. These numbers give the start positions of the dials. 0 represents 12 o'clock, 1 represents 3 o'clock, 2 represents 6 o'clock, and 3 represents 9 o'clock. The example in figure 1 gives the following input data file:

```
3 3 0
2 2 2
2 1 2
```

Output Specification

The output should be the shortest sequence of moves (numbers), which returns all the dials to 12 o'clock. In case there are many solutions, only one is required. There is at least one solution.

Sample Input

```
3 3 0
2 2 2
2 1 2
```

Sample Output

```
4 5 8 9
```

Explanation

Each number represents a time according to the following table:

0 = 12 o'clock

1 = 3 o'clock

2 = 6 o'clock

3 = 9 o'clock

3 3 0		3 0 0		3 0 0		0 0 0		0 0 0
2 2 2	5->	3 3 3	8->	3 3 3	4->	0 3 3	9->	0 0 0
2 1 2		2 2 2		3 3 3		0 3 3		0 0 0