10. Sliding Puzzle

PROBLEM: The "Fifteen Puzzle" is a sliding puzzle that consists of a frame of numbered square tiles in random order with one empty space. The object of the puzzle is to place the tiles in order by making sliding moves that use the empty space.

In this problem, you'll use an *N*-by-*N* grid. The grid will start with one cell empty (we'll tell you which one) and the other cells will be filled with tiles numbered 1 through $N^2 - 1$ starting in the upper left corner. Adjacent tiles can move to the empty space. The diagram at the left below shows the number of each cell in a 4-by-4 grid. The second diagram shows an initial configuration of the puzzle with the cell 7 empty. The third diagram shows moving the 14 tile up (which also causes the 10 tile to move up). The fourth diagram shows moving the 13 tile to the right. The last diagram shows moving the 2 down (which causes the 6 and 9 to also move down). Cell 2 is now empty.

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

1	2	3	4
5	6		7
8	9	10	11
12	13	14	15

1	2	3	4
5	6	10	7
8	9	14	11
12	13		15

1	2	3	4
5	6	10	7
8	9	14	11
12		13	15

1		3	4
5	2	10	7
8	6	14	11
12	9	13	15

INPUT: There will be 10 lines of input. Each line will contain the size of the grid, the initial location of the empty space, and then a list of tiles that are moved. The example above would be "4, 7, 14, 13, 2" meaning it's a 4-by-4 grid, cell 7 is initially empty, and then tiles 14, 13, and 2 are moved in that order.

OUTPUT: For each input line, print the final location of the empty space.

SAMPLE INPUT

```
4 7 14 13 2
4 7 14 13 2 6
5 1 5 15 18 3
3 5 2 3 5 4 2
3 5 2 3 5 4 2 5 8 6
3 7 1 3 8 4
4 5 12 14 3 1 13
4 9 1 4 8 1 12 14 4 2 8
5 21 6 8 18 11 19 4 1 6
3 9 6 5 2 1 4 4 3 6 8 3
```

SAMPLE OUTPUT

```
1. 2
2. 10
3. 4
4. 6
5. 7
6. 7
7. 13
8. 4
9. 11
10. 2
```

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TEST DATA

TEST INPUT	TEST OUTPUT
4 11 9 1 4 11	1. 12
4 1 8 10 2 3 15	2. 16
5 5 1 5 8 18 16 21 24 4	3. 5
3 5 7 8 5 4 1 2 8 6 2	4. 1
2 2 1 2 3 1 2 3 1 2 3 1 2 3	5. 2
4 12 10 2 4 15 13 3 2	6. 10
6 12 35 30 7 11 28 25 13 15 22 14 19 27 22 13	7. 14
8 4 27 24 48 49 57 61 21 17 2 1 3 34 39 15 2	8. 10
11 111 120 11 1 100 109 65	9. 65
5 13 14 19 17 3 8	10. 13