CASTLE

```
.
        1     2     3     4     5     6     7
   * * * * * * * * * * * * * * * * * * * * * * *
1  *           *           *                 *
   * * * *     * * * * *    *     * * * *     *
2  *     *           *     *     *     *     *
   *     * * * * *    * * * * *       * * * *     *
3  *                 *     *     *     *     *
   *     * * * * * * * * * *     * * * * * *    *     *
4  *     *                       *     *
   * * * * * * * * * * * * * * * * * * * * * * *
```
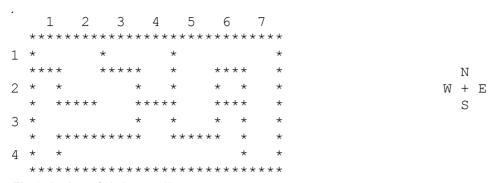
```
          N
     W  +  E
          S
```

*Fig 1. (string of *'s is a wall)*

Figure 1 shows the map of a castle. Write a program that calculates
 1) The number of rooms in the castle.
 2) The size in modules of the largest room.
 3) Which wall to remove from the castle (joining two existing rooms) to make as large a room as possible.

The castle is divided into a grid of square modules m rows by n columns (m <= 50, n<= 50). Each module can have from zero to four walls, inclusive.

INPUT DATA

The input has the following format in the form of numbers, one for each module.

- The data starts with the number of modules in the north-south direction and the number of modules in the east-west direction.
- In the following lines each module is described by a number ($0<=p<=15$). This number is the sum of: 1 (= wall to the west), 2 (= wall to the north), 4(=wall to the east), 8(=wall to the south).
- Inner walls are defined twice, a wall to the south in module 1,1 is also indicated as a wall to the north in module 2,1. The module at position 1,1 has a west, north and south wall so the sum is 1 + 2 + 8 = 11.
- The castle always has at least two rooms.

Input for our example:
```
4
7
11   6 11   6   3 10   6
 7   9   6 13   5 15   5
 1 10 12   7 13   7   5
13 11 10   8 10 12 13
```

OUTPUT DATA

To standard output the following are written on three lines:

 1) The number of rooms.
 2) The area of the largest room counted in modules.
 3) A suggestion of which wall to remove that will join two existing room to make as large a room as possible (first the row and then the column of the module next to the wall and finally the compass direction that points to the wall). There may be more than one but you need only choose one to display.

("4 1 E" is one of several possibilities)

```
5
9
4 1 E
```

The last line refers to the removing the wall.