

4691 The Tile Chase

Žofka and Filip set up a crawling game in the kitchen. The kitchen is tiled with square tiles forming a perfect grid pattern. The children have placed raisins on some of the tiles. The game is played by crawling from tile to tile collecting the raisins on some tiles that are visited. The children start crawling from the northwest corner and work their way to the southeast corner. The objective of the game is to collect as many raisins as possible.

The catch is, they have to crawl and collect raisins according to the following rules:

- start in the northwest corner, end in the southeast corner,
- only the following two moves are allowed: move south (not southeast or southwest) to the neighboring tile, or move east (not northeast or southeast) to the neighboring tile, and
- collect raisins from a tile only if you are changing direction on that tile. For example, if you moved east to get to the current tile and your next move is to the south, you collect all raisins on the current tile.

Filip, just one year old, suspects that he needs a bit of help. So, he is asking you to write a program that tells him which route to take to collect the largest possible number of raisins.

Input

The input file contains several test cases, each of them as described below.

Input to your program consists of lines with non-negative integers, separated by white space.

The first line contains r and c , the number of rows and columns in the grid (each ≤ 1000). Each of the next r lines contains c numbers, the number of raisins on each tile in one row of the grid (each ≤ 1000).

The race starts in the northwest corner, i.e., first column of the first row; this tile contains no raisins. The race ends in the last column of the last row — no raisins there, either.

Output

For each test case, the output from your program should be one line with a number and a string, separated by a single space.

The number defines how many raisins are on the path and the string defines the path with each move designated by a letter ('E' for east and 'S' for south). The string length will be $r + c - 2$.

Sample Input

```
3 5
0 2 5 0 6
1 2 0 3 7
0 0 2 8 0
```

Sample Output

```
16 EESESE
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