

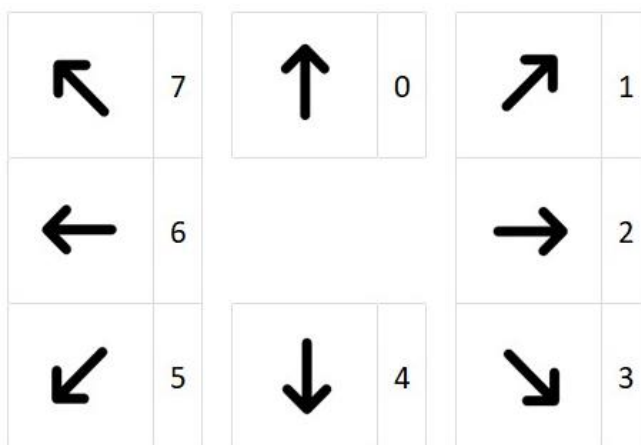
FlowField



SEASON 9 – SECOND ROUND

The physics faculty needs a simulation with the following parameters:

There is a discrete two dimensional space (grid with cells) with C columns and R rows. Initially, in every cell a single particle is placed, as well as a one of eight possible vectors (described later). The time is discrete too, separated in simulation steps. Every step, every particle on the grid goes to one of the eight **neighbour** cells (or falls out of the grid and disappears), depending on the vector in that cell. For example, if a particle is in cell $(3;3)$ and there is a vector of type 1 $(1;-1)$, in the next simulation step the particle will be in cell $(4;2)$. Write a program that will compute how many particles there are in every cell of the grid after S simulation steps.



Each of the eight possible vectors has a digit (type) associated with it. The direction of the arrow shows in which **neighbour** cell a particle following that vector will go.

For example, a vector of type 3 would make a particle go from $(c;r)$ to $(c+1;r+1)$.

Input

From the first line of the file `flowfield.in` three integers are entered - C , R and S
On each of the next R lines there are C digits (0 to 7) - the vectors in every cell of the grid.

Output

In the file `flowfield.out` output the number of particles in every cell of the grid after S simulations. **There are spaces between the digits.**

Constraints

$$2 \leq R, C \leq 100$$

$$1 \leq S \leq 10^{17}$$

Time limit: 0.3 seconds

Memory limit: 256 MB

Example

FlowField

SEASON 9 – SECOND ROUND

Input (flowfield.in)	Output (flowfield.out)
3 3 2	1 2 0
2 4 6	1 2 0
0 4 0	1 1 0
0 6 4	

On the following illustration you can see the state of the grid after zero (initially), one and two simulation steps. Particles are named for clarity only.

