Programming Competition

NUTEC

Crazy Bacteria

Time: 12 sec

Memory: 5KB

A scientist observing a specimen under a microscope observes some crazy bacteria on it. The specimen is a 2D grid of 50×50 cells. A bacteria can reside inside one cell only. If a cell contains a trace of the bacteria, it is marked as 1, otherwise it is 0. The collective representation of these 1's and 0's in the grid represents the specimen state at time ti. As time evolves from ti to ti+1, the scientist observes the following behavioural patterns in the bacteria:

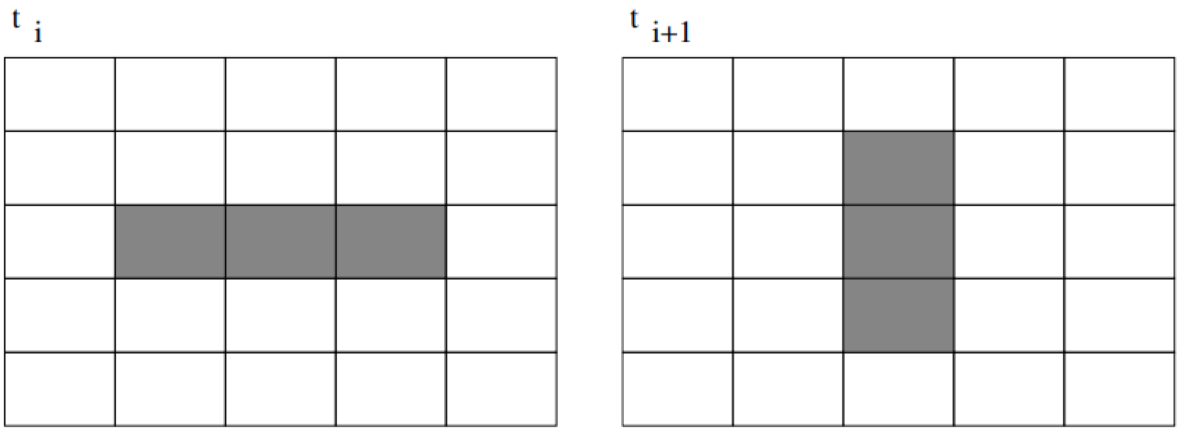
If a bacteria living in a cell has < 2 neighbours at ti , it dies of loneliness at ti+1.
If a bacteria living in a cell has > 3 neighbours at ti , it dies of suffocation at ti+1.
If a bacteria has exactly 2, or 3 neighbours at ti , it continues to live at ti+1.

If a non-living cell has 3 neighbouring cells with bacteria in it at ti , it will become alive at ti+1.

Each cell may have 3, 5, or 8 neighbouring cells, depending on their position in the specimen. This behaviour leads to interaction between neighbouring bacteria and as a result, complex and crazy life-forms can be observed in the specimen.

Task

Your job is to run the simulation for a specimen with a given number of life-forms. The simulation will comply with the behaviour rules observed by the scientist.



Pictorial Representation: A rotating life-form created by the participation of 3 bacteria, observed at time t i and then at t i+1

Input

The first line contains the total number of life-forms (1 to 100) in the specimen. The subsequent lines describe how the life-form is structured inside the specimen. The single digit number at the start of the line (ranging from 1 to 2500) represents the participating bacteria in the life-form. The remainder of the line contains the x,y co-ordinates of where those bacteria contaminated cells are located.

Your simulation will take the first life-form and run it from t0 to t49. Then, it will add the next life-form to whatever is the current state of the grid at t49, and run it for 50 more iterations (t50 to t99), so on and so forth.

Output

The output will represent the total number of bacteria present on the specimen at various intervals during the simulation. When the simulation takes the first life-form and runs it from t0 to t49, the total number of bacteria in the specimen at the end of time t0, t25, t49 are output as three values on a single line separated by a space. When the simulation takes the second life-form and runs it from t50to t99, the number of bacteria in the specimen at the end of time t50, t75, t99 are output on the second line. This process continues until all life-forms are simulated.

Sample Input

5

7 24,23 23,24 24,24 25,24 23,25 24,25 25,25

8 10,10 9,11 10,12 12,10 13,12 13,13 12,13 14,13

5 35,35 36,35 35,36 34,36 33,36

6 35,10 34,10 34,11 33,11 33,12 32,12

6 10,35 11,35 10,36 12,36 11,37 12,37

Sample Output

6 12 12

22 40 39

48 55 109

101 104 91

95 50 33