Escape from Chernobyl

The government of the Soviet Union is in panic after the explosions in the Chernobyl Nuclear Power Plant. People are trying to escape from the power plant. The government has provided a map to all the workers of the power plant, but people are panicking and are unable to find a path. You are Anatoly Dyatlov, the chief of the Chernobyl Nuclear Power Plant. Feeling responsible for the explosions, you are trying to work out a path for each of your workers.

"If you don't find out how this happened, it will happen again."

Escape Plan:

You have a map of the Chernobyl Nuclear Power Plant. It is in the form of a 2D grid. Your workers have to start from the bottom-left cell and reach the gate of the power plant, where the government will rescue them and take them to safety. Although most of the cells are safe right now, in some of them there are explosions happening. In case, any of your workers sets foot in a cell where an explosion is happening, they go back by some **"K"** steps. Now, the only problem is that all you can do is tell the workers what step size they have to take, which ranges from **[L, R]** . The workers will move certain steps on their own each time.

In other words, you have to do the following:

- You(server) have to generate a map of the power plant which is represented as a 2D grid. The empty cells are represented as **"."** and bombs are represented as **"#"** .
- Each of the workers(clients) can take a random step size at each timestep. The step size lies in the range **[L, R]** . After generating the step size, each of your workers report it to the server and the server modifies the grid accordingly.
    - If the current cell is free, then the worker can rest there for that timestep.
    - If the current cell has an explosion going on, the worker will move **"K"** steps back.
- After a certain finite number of timesteps, each resident will escape.
- Whenever a worker(client) escapes, print the "<worker name> escaped." on the terminal of every other worker(client). Also, close the client connection, once that worker(client) escapes.
- After everyone has escaped successfully, print the order in which the workers escape the nuclear power plant in the server terminal. And rest easy! :)

Program Files:

You have to make two scripts in Python/C++.

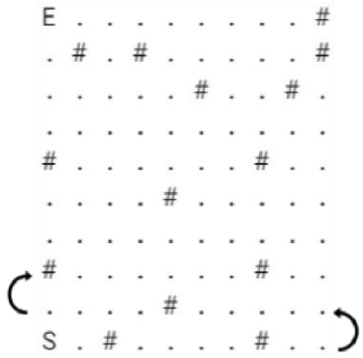
1. **Chief of Power Plant (Server)**: Sets up the map for the escape plan in the power plant and assigns ID/Name to each worker . At the beginning of the escape, sends two numbers **“L”** and **“R”** to the workers. Accepts random step sizes from each worker (client), and moves them ahead or back depending on the condition. At each timestep, prints the map with worker positions in its terminal. Also, prints which worker has escaped on all the clients’ terminals. Lastly, prints the order in which workers escaped in its own terminal.
2. **Workers (Clients)**: Sends a random number in the range **[L, R]** to the server.
   Note:- all the workers must run the same script.

Constraints:

- No. of workers = 4
- Grid: 10 x 10
- L=1, R=6
- K=8

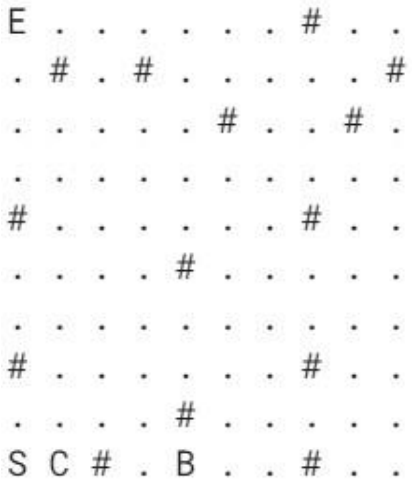
Example

- **Grid: (“.” are free cells, “#” are explosions)**

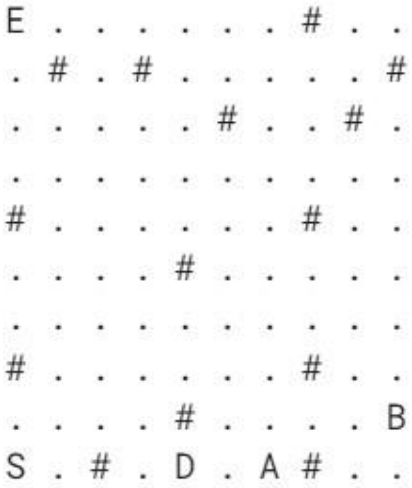


- 4 residents (A, B, C, D) start from the bottom-left corner of the grid.
- At each timestep (t), every resident assigned a step size randomly in range [1, 6]. Each player moves by assigned steps.
- t=1, A = 2, B = 4, C = 1, D = 2

- Player A and D move to cell (2, 0) and Player B goes to (4, 0) and C goes to (1, 0).
- Since A and D hits a cell containing bomb, they are moved back by k steps. As they cannot move back more than 2 steps they will restart from start cell.



- t=2, A= 6, B = 4, C = 5, D = 4
- After t = 2, the grid looks like:



- After a finite number of time steps, all 4 residents will escape.