



## 4663 - Hero's Adventure

Asia - Jakarta - 2009/2010

There is a game production company that is going to develop a new adventure game. You're very interested and join the recruitment phase. You're being tested to solve this simulation:

- For each simulation there will be an  $R \times C$  map with the following characters:
  - ♦ '#' represents wall, hero can't move here.
  - ♦ 'S' represents starting point of the hero.
  - ♦ 'F' represents finish point, the game ends.
  - ♦ Number '1' to '9' represents the life point to be reduced if the hero moves here.
  - ♦ 'E' represents enemy that the hero needs to fight if the hero wants to move here.
  - ♦ 'I' represents item that will add 100 points to the hero's life force, becomes '0' after taken (no life force will be reduced to come back to this point).
- The hero has life force ( $Lf$ ), Experience ( $Exp$ ), Defend power ( $Def$ ) and Strength ( $Str$ ).
- The hero will be given extra 1 (one) point for the strength and defend power for each 25 (twenty five) experience point gained by the hero.
- Hero will die if  $Lf \leq 0$ .
- Rules of the fight with enemy:
  - ♦ Each enemy will have Strength, Life force and Experience.
  - ♦ The hero and the enemy will be given one chance to attack the other each turn starts with the hero, until either the hero or the enemy dies (life force  $\leq 0$ ).
  - ♦ If the hero attacks the enemy, the enemy's life force will be decreased by the hero's strength.
  - ♦ If the enemy attacks the hero, the hero's life force will be decreased by the enemy's strength reduced by the hero's defend power.
  - ♦ The hero will be given the enemy's experience if the hero defeats the enemy.
  - ♦ After the enemy is defeated, the place will become '0' (no life force will be reduced to come back to this point).

For each simulation, you're asked to print three paths,  $Lf$  and  $Exp$  to the finish point that give:

1. The highest  $Lf$ .
2. The highest  $Exp$ . If there's more than one highest  $Exp$ , choose the highest  $Lf$ .
3. The shortest way. If there's more than one shortest way, choose the highest  $Lf$ .

If there is multiple path, choose the lexicographically smallest one.

### Input

Input consists of several cases. Each case begins with four integers in a line:  $Str$  ( $3 \leq Str \leq 10$ ),  $Def$  ( $0 \leq Def \leq 5$ ),  $Exp$  ( $0 \leq Exp \leq 20$ ) and  $Lf$  ( $10 \leq Lf \leq 1000$ ). Denoting the strength, defend, experience and life force of the hero respectively. The next line contains  $C$  ( $3 \leq C \leq 20$ ) and  $R$  ( $3 \leq R \leq 20$ ) denoting the columns and rows of the map respectively. The next  $R$  lines contain the map as described above. The next lines contain the description of the enemy,  $eStr$  ( $0 \leq eStr \leq 10$ ),  $eLf$  ( $10 \leq eLf \leq 100$ ) and  $eExp$  ( $1 \leq eExp \leq 25$ ) denoting the enemy's strength, life force and experience to be gained if it dies respectively. Each enemy data corresponds to each 'e' which appears first in the map.

## Output

For each simulation print "Simulation #n" without double quote(") and #n replace by the simulation number start with 1. The next three lines each contain path, life force and experience. Use 'L' (left), 'R' (right), 'D' (down), 'U' (up) to describe the path that should be taken by the hero.

If it's not possible to reach the finish point then print "No solution." without double quote (") instead of the three lines. Print blank line between simulation.

## Sample Input

```
10 5 20 1000
3 3
###
SEF
###
10 50 15

10 0 0 100
7 4
#####
S12E#2#
#IE456F
#####
3 10 5
10 100 20

10 0 0 10
3 3
###
SEF
###
10 50 15
```

## Sample Output

```
Simulation 1
RR 980 35
RR 980 35
RR 980 35

Simulation 2
RDURRDRRR 181 5
RDRRUDDRRR 90 25
RDRRRRRR 94 20

Simulation 3
No solution.
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