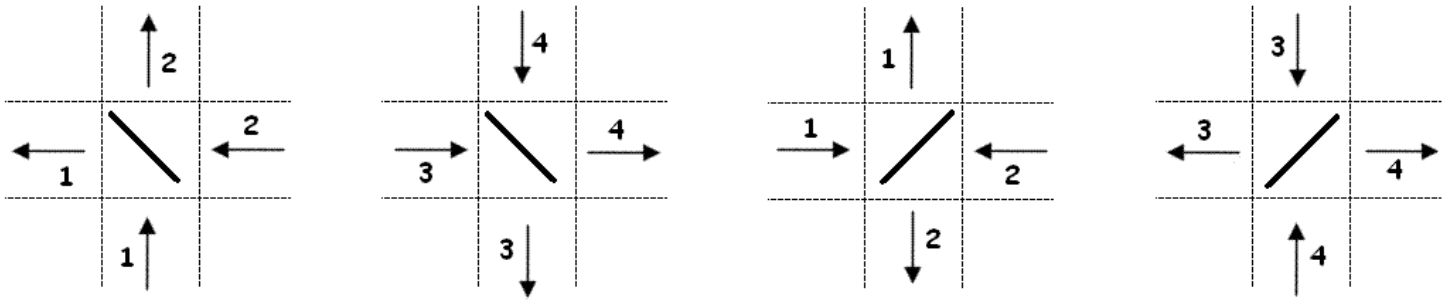
COCI '12 Contest 4 #3 Voyager

Time limit: 1.0s **Memory limit:** 32M

The Voyager 1 space probe (not to be confused with the Intrepid-class starship) was launched a long time ago, in 1977, and is currently on the verge of leaving our Solar System. As it travels further through space, it has been programmed to leave a radio signal message in any star system it stumbles upon, to mark the probe's path for as long as possible.

Let us assume that a star system can be represented by a rectangular grid with N **rows** and M **columns**, dividing the space into $N \times M$ equal cells. Each cell can contain a single **planet**, **black hole**, or be **empty**. The probe broadcasts the signal from a pre-determined empty cell, in one of the four axis-aligned directions (`U`-up, `R`-right, `D`-down, `L`-left).

Upon being broadcast, the signal propagates in a straight line along the same row/column until it reaches a planet, where it is deflected by 90 degrees in another direction. There are two kinds of planets, which we will denote by `/` and `\`. The deflection rules are shown in the image below:



The signal permanently leaves the system upon either entering a cell containing a black hole, or propagating outside the edges of the rectangular grid. It is also known that the signal needs one second to propagate from the current cell to a neighbouring one.

Write a program to determine the direction in which the probe needs to broadcast the signal so that it remains within the system for **as long as possible**, outputting the optimal direction as well as the resulting longest time. If it is possible for the signal to remain in the system indefinitely, output the message `Voyager` instead of the required time.

Input Specification

The first line of input contains two positive integers, N $(1 \leq N \leq 500)$ and M $(1 \leq M \leq 500)$.

Each of the following N lines contains M characters from the set $\{$`/`, `\`, `C`, `.`$\}$, where `/` and `\` represent the two kinds of planets, `C` represents a black hole, and `.` represents an empty cell.

The last line of input contains two positive integers, PR $(1 \leq PR \leq N)$ and PC $(1 \leq PC \leq M)$, the row and column number, respectively, of the cell where the probe is situated.

Output Specification

The first line of output must contain the required optimal broadcast direction (`U`, `R`, `D`, or `L`).

If the solution is not unique, select the first optimal one in the following priority order: first `U`, then `R`, then `D`, and finally `L`.

The second line of output must contain the required longest time (or message).

Scoring

In test data worth at least 50% of total points, the signal will not be able to remain in the system indefinitely.

Sample Input 1

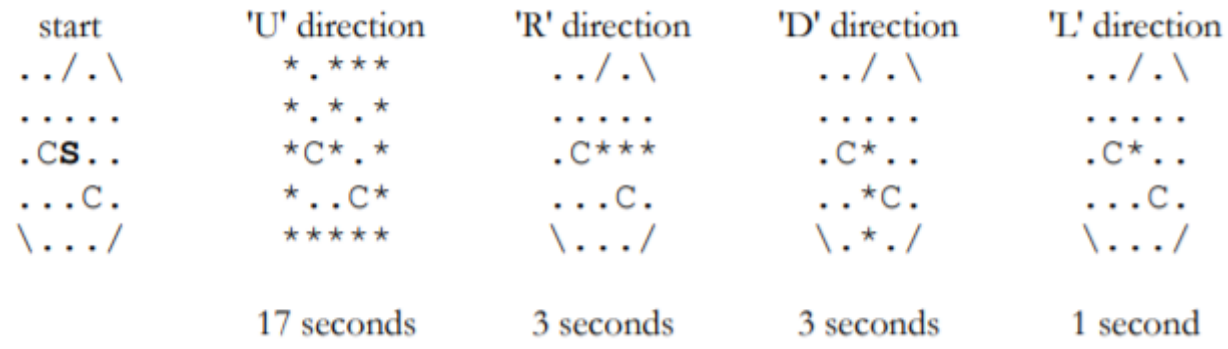
```
5 5
../.\
.....
.C...
...C.
\.../
3 3
```

Sample Output 1

```
U
17
```

Explanation for Sample Output 1

`*` represents the path of the signal:



Sample Input 2

```
5 5
....\
\..\.
./\..
\../C
.\../
1 1
```

Sample Output 2

```
D
12
```

Sample Input 3

```
5 7
/.....\
../..\.
\...../
/.....\
\.\.../
3 3
```

Sample Output 3

```
R
Voyager
```