Infix in Matrix

Data Structures Assignment 1
Stacks and Queues

2018.3.27

NTHU EE and CS

https://acm.cs.nthu.edu.tw/problem/11860/

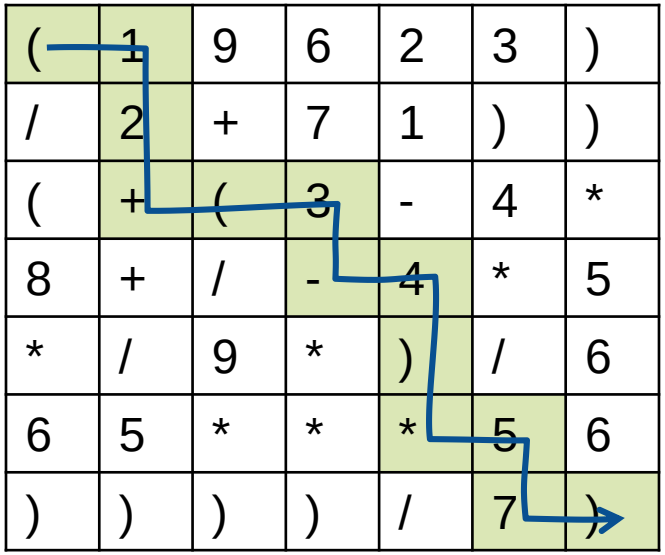
- 禁止互相參考作業或直接取用他人的程式
  - 禁止直接從網路上取用現成的程式片段
  - 禁止上傳非自己獨力完成的程式到OJ或LMS
    - 包括幫忙debug、幫忙測試、不小心傳錯...都禁止
  - 如發現非自己獨力完成(雷同)的作業程式，該次作業會得到零分(包括被別人抄襲、或參考網路資源)或甚至這科不及格(抄襲別人)
  - 保管好自己的程式，不要放在其他人能取得的地方，造成自己的成績損失
    - 如果是在公用 Linux 環境寫作業，務必將家目錄權限設成 700，避免有他人能讀取你的程式

```
cd ~/..
chmod 700 YourHomeDir
```

換成你的帳號

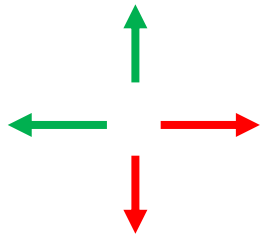
Objective

- Determine whether a matrix contains at least a legal infix expression
  - From the top-left corner to the bottom-right corner
  - If yes, convert it based on the postfix notation



Hint

- Each cell can be reached by up to four directions (up, down, right, left)
- Each cell can be visited at most one time
- The priority directions are: down>right>left>up
- Matrices are consisted of 1~9, +,-,*,/, (,)
  - The consecutive numbers are considered as one operand
  - There is no negative number (e.g., -5 is illegal)
- Use a space to separate operands and operators
- Matrix width and height < 100



- Valid expression examples
  - 12345
  - ((12345))
  - 1 + ((2))
- Illegal expression examples
  - ( ) + (3)
  - - 4 + 3
  - 3 + (- 4)
  - + 5 + 5
  - 3 (1 + 2)
  - (1 + 2) (3 + 4)

Input

Total number of matrices	2
Matrix width	7
Matrix height	7
The matrix	(1 9 6 2 3) / 2 + 7 1)) (+ (3 - 4 * 8 + / - 4 * 5 * / 9 *) / 6 6 5 * * * 5 6)))) / 7)
Matrix width	4
Matrix height	4
The matrix	2 3 2 1 3 4 1 5 * + 2 1 1 + 1 1

Output

- Repeat all inputs
- Additionally print
  - If Yes, output
    - Yes
    - Infix expression
    - Postfix expression
  - If No, output
    - No

```
2↲
7↲
7↲
( 1 9 6 2 3 )↲
/ 2 + 7 1 ) )↲
( + ( 3 - 4 *↲
8 + / - 4 * 5↲
* / 9 * ) / 6↲
6 5 * * * 5 6↲
) ) ) ) / 7 )↲
Yes↲
( 12 + ( 3 - 4 ) * 57 )↲
 12 3 4 - 57 * +↲
4↲
4↲
2 3 2 1↲
3 4 1 5↲
* + 2 1↲
1 + 1 1↲
Yes↲
23 * 1 + 11↲
23 1 * 11 +↲
```