淡江大學電機工程學系106學年度勒體實驗題目

12.【追蹤試算表中的儲存格/Spreadsheet Tracking】

有一個 r 列 c 欄（$1 \le r, c \le 50$）的試算表，列從上到下編號為 1~r，欄從左到右編號為 1~c。如圖（a）所示，如果先刪除第 1、5 列，然後刪除第 3、6、7、9 欄，結果如圖（b）和（c）所示。

↘	1	2	3	4	5	6	7	8	9
1	**22**	**55**	**66**	**77**	**88**	**99**	**10**	**12**	**14**
2	2	24	6	8	22	12	14	16	18
3	18	19	20	21	22	23	24	25	26
4	24	25	26	67	22	69	70	71	77
5	**68**	**78**	**79**	**80**	**22**	**25**	**28**	**29**	**30**
6	16	12	11	10	22	56	57	58	59
7	33	34	35	36	22	38	39	40	41

（a）

↘	1	2	3	4	5	6	7	8	9
1	2	24	6	8	22	12	14	16	18
2	18	19	20	21	22	23	24	25	26
3	24	25	26	67	22	69	70	71	77
4	16	12	11	10	22	56	57	58	59
5	33	34	35	36	22	38	39	40	41

（b）

↘	1	2	3	4	5
1	2	24	8	22	16
2	18	19	21	22	25
3	24	25	67	22	71
4	16	12	10	22	58
5	33	34	36	22	40

（c）

接下來在第 2、3、5 列前各插入一個空列，然後在第 3 欄前插入一個空欄，會得到如圖（d）和（e）的結果。

↘	1	2	3	4	5
1	2	24	8	22	16
2					
3	18	19	21	22	25
4					
5	24	25	67	22	71
6	16	12	10	22	58
7					
8	33	34	36	22	40

（d）

↘	1	2	3	4	5	6
1	2	24		8	22	16
2						
3	18	19		21	22	25
4						
5	24	25		67	22	71
6	16	12		10	22	58
7						
8	33	34		36	22	40

（e）

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你的任務是模擬這樣的 n 個操作，具體來說一共有 5 種操作：

- EX r1 c1 r2 c2 交換儲存格（r1, c1），(r2, c2）
- <command> A x_1 x_2... x_A 插入或刪除 A 列或欄（DC−刪除欄，DR−刪除列，IC−插入欄，IR−插入列，$1 \le A \le 10$）

在插入/刪除指令後，各個 x 值不同，且順序任意。接下來是 q 個查詢，每個查詢格式為「r c」，表示查詢原始表格的儲存格 (r, c)。對於每個查詢，輸出操作執行完成後該儲存格的新位置。輸入保證在任何時刻列欄數均不超過 50。

輸入（註 1）：

```
7 9
5
DR 2 1 5
DC 4 3 6 7 9
IC 1 3
IR 2 2 4
EX 1 2 6 5
4
4 8
5 5
7 8
6 5
0 0
```

輸出（註 2）：

```
Spreadsheet #1
Cell data in (4, 8) moved to (4, 6)
Cell data in (5, 5) GONE
Cell data in (7, 8) moved to (7, 6)
Cell data in (6, 5) moved to (1, 2)
```

（註 1）

Input

The input consists of a sequence of spreadsheets, operations on those spreadsheets, and queries about them. Each spreadsheet definition begins with a pair of integers specifying its initial number of rows (r) and columns (c), followed by an integer specifying the number (n) of spreadsheet operations. Row and column labeling begins with 1. The maximum number of rows or columns of each spreadsheet is limited to 50. The following n lines specify the desired operations.

An operation to exchange the contents of cell (r_1, c_1) with the contents of cell (r_2, c_2) is given by:

`EX` r_1 c_1 r_2 c_2

The four insert and delete commands—`DC` (delete columns), `DR` (delete rows), `IC` (insert columns), and `IR` (insert rows) are given by:

$< command > A\ x_1\ x_2\ \ldots\ x_A$

where $< command >$ is one of the four commands; A is a positive integer less than 10, and $x_1, \ldots, x_A$ are the labels of the columns or rows to be deleted or inserted before. For each insert and delete command, the order of the rows or columns in the command has no significance. Within a single delete or insert command, labels will be unique.

The operations are followed by an integer which is the number of queries for the spreadsheet. Each query consists of positive integers r and c, representing the row and column number of a cell in the original spreadsheet. For each query, your program must determine the current location of the data that was originally in cell (r, c). The end of input is indicated by a row consisting of a pair of zeros for the spreadsheet dimensions.

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（註 2）

Output

For each spreadsheet, your program must output its sequence number (starting at 1). For each query, your program must output the original cell location followed by the final location of the data or the word 'GONE' if the contents of the original cell location were destroyed as a result of the operations. Separate output from different spreadsheets with a blank line.

The data file will not contain a sequence of commands that will cause the spreadsheet to exceed the maximum size.