

A one-dimensional array with length l can be used to store $m \times n$ two-dimensional arrays with arbitrary values for m and n in following manner:

$$A_k = B_{i,j} \quad \forall i \in \{1, \dots, m\} \quad \forall j \in \{1, \dots, n\}$$

where A_k is the k^{th} element of array A and $B_{i,j}$ is the element of matrix B in i^{th} row and j^{th} column. The index k is a combination of index i and index j . For a row-major matrix, we have $k = i * n + j$; for a column-major matrix, we have $k = j * m + i$.

Write a program to transfer a one-dimensional array to the corresponding two-dimensional array, or transfer a two-dimensional array to the corresponding one-dimensional array. Your program must store the contents of input and output in two separate arrays.

Input

The input has several cases and ends with an asterisk symbol. Each case contains three integers m, n and l , and two symbols. The first symbol indicates the direction of transfer (U for dimension up , D for dimension down), and the second symbol represents the form of the matrix (R for row-major, C for column major).

Output

For each case, output the corresponding one or two-dimensional array. Each row should be separated by a newline character and two neighboring columns should be separated by a space. Also, there must be a newline character to separate two consecutive cases.

Sample Input

3 10 30 U R
8 0 8 8 0 6 8 1 9 8 9 7 2 2 8 2 8 9 0 7 8 1 5 8 6 1 2 4 2 5

6 2 12 U C
6 6 7 6 7 7 1 9 1 6 2 7

2 4 D R
1 2 3 4
5 6 7 8

2 4 D C
1 3 5 7
2 4 6 8

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Sample Output

8 0 8 8 0 6 8 1 9 8
9 7 2 2 8 2 8 9 0 7
8 1 5 8 6 1 2 4 2 5

6 1
6 9
7 1
6 6
7 2
7 7

1 2 3 4 5 6 7 8

1 2 3 4 5 6 7 8