

## Problem E – Robot

Little Long is now in grade 10<sup>th</sup>. He is making a transportation robot to compete in the Intel ISEF. After 3 days of working with his supervisor, Little Long managed to create a robot which can accept four kinds of instruction: 'u', 'd', 'r', 'l' – which mean moving one step upward, downward, to the right and to the left respectively.

He is a very careful and strict person so he follows the Software Development Life Cycle. He brings the robot inside a room of  $m * n$  squares for testing. He puts the robot at a random square and gives it a sequence of instructions (a string consists of only four characters – u, d, r, l). The robot executes the instruction from left to right and follows the direction of the instruction. The robot will not execute an instruction which asks him to move out of the room, so if there is such instruction, the robot will simply ignore the instruction and move to the next one. Little Long is curious with a question: how many different positions in which the robot can finish its journey (i.e. the initial location can be any position in the room).

### Input

The first line of the input contains one integer  $T$  ( $T \leq 10$ ), which is the number of cases in this input set. There are  $T$  test cases follow. Each test case consists of 2 lines:

- The first line has only 2 numbers  $m$  and  $n$  ( $m, n \leq 10^5$ ) which is the width (left-right dimension), the length (up-down dimension).
- The second line has one string  $s$  ( $length(s) \leq 10^5$ ), which is the instruction sequence.

### Output

$T$  lines, which are the answers for  $T$  test cases with the same format as the sample data.

### Sample

Sample input	Output for sample input
3 2 2 ul 3 3 ulrrrr 4 2 Uddlur	Case 1: 1 Case 2: 2 Case 3: 3