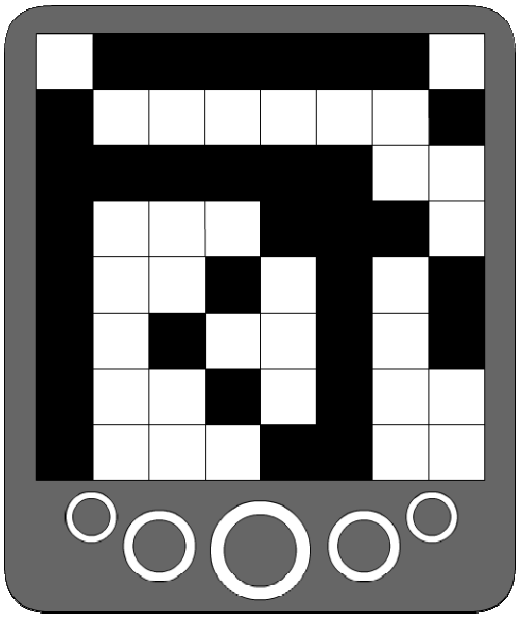
G Power Faster

Input: Standard Input
Output: Standard Output



This is Power Faster. In future, this is going the primary study material for the children of primary schools in Bangladesh. A durable, waterproof, power efficient and light weight electronic device. Laptops are out of consideration in the first place. We are living in a land of hurricanes, heavy rain falls and floods, after all. And besides, this device is supposed to be used by a 5 to 10 year old kid. Carrying it to school everyday and again carrying it back home is only possible when the device is truly portable according to a child's standards.

The flat rectangular part to the front is the display unit. And LDC screen consisting of pixel arranged in a regular grid of ***R*** rows and ***C*** collumns along with a display adaptar comprises the display unit. The LDC screen has some special properties making it power efficient in an unusual way. It consumes least power when exactly 50% of its pixels are turned ON and the rest are OFF. For any other number of ON and OFF pixels, the power consumption increases linearly upto the point of maximum consumption which occurs when either all pixels are turned ON or all are turend OFF.

The display adapter gets a bitmap image with dimensions ***r*** **x** ***c***, let us call it the input image, which has to be shown on the screen. To minimize the power consumption, display adapter scales the image in horizontal and vertical directions by integer scaling factors such that the dimensions of the scaled input image do not exceed that of the display screen. The scaling factors in horizontal and vertical direction are independent.

The scaling process is analogous to enlarging a photograph. When scaled by a horizontal and vertical scaling factor of ***hs*** and ***vs*** respectively, the result is an image of ***r*vs*** rows and ***c*hs*** columns. Each pixel in the input images corresponds to a rectangle of ***vs*** rows and ***hs*** columns in the resulting image. Note that, however tempting it might seem, the display adapter does not perform any kind of rotation.

You are asked to write a program performing the scaling for the display adapter.

Input

Input will consist of multiple test case. Each test case starts with a line containing 4 positive integers ***R C r c*** seperated by whitespace. Next ***r*** lines, each having ***c*** characters on it, comprises the input image. The input image is drawn using '**.**' (dot) and '**#**' (hash) characters and there will be no other character in the input image. You can also assume that, ***R*** >= ***C, r***>=***c*** and all numbers are positive integers smaller than **30000**.

There will be **1005** such test cases.

Output

Print one line of output for each test case. The output of each case starts with the case number written as **"Case n: "** (excluding the quote marks) as shown in the sample output followed by two integers. The first integer will be the scaling factor in horizontal direction, second integer should be the scaling factor in vertical direction.

If more than one possible way to achieve minimum power consumption exists, output the one with largest horizontal scaling factor. If there are still multiple solutions, output the one with smallest vertical scaling factor. All numbers should be positive integers.

Sample Input	Output for Sample Input
50 25 8 4 #### #..# #..# #..# #..# #..# #..# #### 2 2 1 1 #	Case 1: 6 5 Case 2: 2 1

Problem setter: Raiyan Kamal, Special Thanks: Sabbir Yousuf Sanny