Bar Code

You are given a rectangular picture with $n \times m$ pixels (n rows, m columns). Each pixel can be white or black. Your task is to change the colours of as few pixels as possible to obtain a *bar code*. A picture is a bar code if the following conditions are fulfilled:

1. In each column, all pixels are of the same colour.

2. For some given integer parameters $x \leq y$, the width of each monochrome vertical line is at least x pixels and at most y pixels. In other words, if we group together adjacent columns with pixels of the same colour, the number of columns in each group cannot be less than x or greater than y.

For instance, consider the following picture, where "." represents a white pixel and "#" represents a black pixel. Suppose $x = y = 1$.

```
#####
.....
```

We can alternately flip the top and bottom pixel in each column to get the following bar code after five flips.

```
.#.#.
.#.#.
```

Input format

- Line 1 contains four space-separated integers n, m, x and y.
- The next n lines describe the original image. Each of these lines contains exactly m characters. The character "." represents a white pixel and the character "#" represents a black pixel. The picture description does not have any other characters other than "." and "#".

Output format

A single line containing a single integer, the minimum number of pixels to be transformed to create a bar code meeting the given constraints. Output 0 if no bar code exists.

Test data

In all testcases, $x \leq y$.

- Subtask 1 (20 marks) : $1 \leq n, m, x, y \leq 18$.
- Subtask 2 (80 marks) : $1 \leq n, m, x, y \leq 1000$.

Sample input 1

```
6 5 1 2
##.#.
.###.
###..
#...#
.##.#
###..
```

Sample output 1

```
11
```

In the first sample input, the picture can be transformed as follows:

```
.##..
.##..
.##..
.##..
.##..
.##..
```

Limits

- *Memory limit* : 128 MB
- *Time limit* : 4s

Sample input 2

```
2 5 1 1
#####
.....
```

Sample output 2

```
5
```

In the second sample input, the picture can be transformed as follows:

```
.#.#.
.#.#.
```