A Mouse on a Checkerboard (150 points)

Introduction

A mouse is on a checkerboard of size MxN (The North West corner is (0,0)). With every step, the mouse can move **North**, **East**, **South**, **West** or **Stay** at the same place with probablities Pn, Pe, Ps, Pw and Pstay respectively.

The mouse starts on position (X0,Y0).

What is the probabily of finding the mouse at position (Xf, Yf) after K steps?

Note that if the mouse is on the border, the probabilities are **renormalized** to take into account the impossibility of moving in one or more directions.

Input Specifications

M, N, X0, Y0, Xf, Yf, K are integers Pn, Pe, Ps, Pw, Pstay are floats.

Your program will take a single line in the following format as input:

- M N Pn Pe Ps Pw Pstay X0 Y0 Xf Yf K

Output Specifications

The probability of finding the mouse on Xf Yf after K steps, **truncated** at 3rd decimal e.g:

- 0.02398754245 => 0.023

Sample Input/Output

Input

3 3 0.25 0.25 0.25 0.25 0 1 1 0 1 1

Output

0.25

Explanation

After one step the mouse has a probability of 25% to be North of the starting position.

Input

9 9 0.25 0.25 0.125 0.125 0.25 4 4 4 4 3

Output

0.109

Explanation

The probability of finding the mouse in the initial position after 3 steps is ~10.9%.

Input

`3 3 0.25 0.25 0.125 0.125 0.25 1 1 1 1 10`

Output

`0.121`

Explanation

On the border, the mouse cannot move in certain directions. The remaining options need to have their probability re-normalized.