Robot on Ice

| Problem Code	hw08c_robot
Running Time Limit	1 sec
Memory Limit	32 mb

Objective

- Be able to solve search problem using backtracking.

Introduction

A robot working at a north pole has to survey a rectangular area of glacier. The glacier is a rectangular grid of M rows and N columns. Each cell is labeled as $(row, column)$ where the lower left corner is labeled as grid $(0,0)$. The robot hast to visit all cells in the grid. The robot is set to start at cell $(0,0)$ and it has to travel through every cell and ends at cell $(0,1)$. However, as the glacier is very fragile, the robot must visit each cell only once. From a cell, a robot is allowed to move to 4 immediate neighbor cells (north, east, west and south). In total, the robot must visit exactly $M \times N$ cells.

Additionally, the robot does not have enough fuel to travel through all cells in one go. It has to re-fuel three times when it has traveled 1/4, 2/4 and 3/4 of total distance. There are exactly three fuel stations in the grid at specific cell. The robot must visit the first station exactly when it has travelled 1/4 of its total distance. It must also visit the second station exactly when it has travelled 2/4 of its total distance and it must visit the last station exactly when it has travelled 3/4 of its total distance.

For example, assume that the glacier is a grid of 3×6 cells and the fuel station, in order of visitation, are at $(2,1), (2,4)$ and $(0,2)$. Then the robot must start at $(0,0)$ and end at $(0,1)$ after visiting all 18 cell. It must visit location $(2,1)$ on step 4 $(= \lfloor 18/4 \rfloor)$, location $(2,4)$ on step 9 $(= \lfloor 2 \times 18/4 \rfloor)$, and location $(0,4)$ on step 13 $(= \lfloor 3 \times 18/4 \rfloor)$. There are just two ways to do this as depicted in the following illustration.
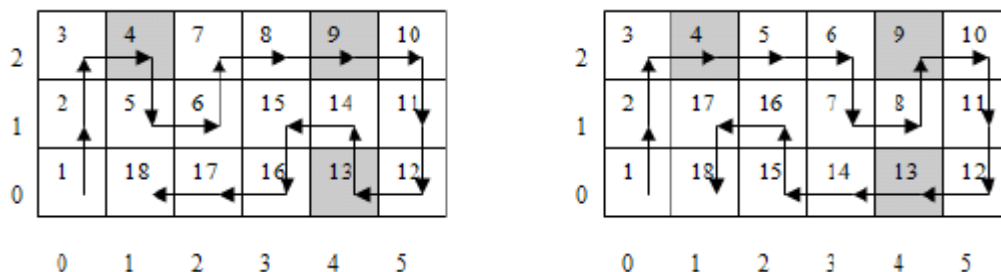
Task

Your task is to compute the total number of possible route that the robot could travel, given the size of the glacier and the three re-fueling cells.

Input

The first line of input contains two positive integer M and N ($2 \leq M, N \leq 8$). The next line contains six positive integers that give the row and column coordinate of the three re-fuelling cells.

Output

The output contains exactly one number that gives the total number of tours. Report 0 when there is no possible tour.

Problem Credit

This problem is taken from ACM-ICPC UVa online judge problem #4793

Example

Ex1

Input	Output
3 6 2 1 2 4 0 4	2

Ex2

Input	Output
4 3 2 0 3 2 0 2	0