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Algorithms Lab

Exercise – New Tiles

Problem Domino Magic started releasing brand new 2×2 tiles because everybody is already tired of the 1×2 domino tiles. To make a long story short, you are given a rectangular floor plan with some cells which you are not allowed to place tiles on, and your goal is to maximize the number of new 2×2 tiles you can put in this rectangle without overlapping.

Input The first line contains $1 \le t \le 20$, the number of testcases. Each of the t testcases is described as follows:

- It starts with a single line that contains two integers h w, separated by a space, specifying specify the height h and the width w of the floor plan at hand $(1 \le h \le 100, 1 \le w \le 17)$.
- The following h lines each describe one row of the floor plan, ordered from top to bottom. Each such line consists of w space-separated characters: '1' if that square can be tiled and '0' if it cannot be used. You may assume that the floor plan is surrounded by a wall, so the border cells of the input consist of 0's.

Output For each test case output a single line with the maximum number of new 2x2 tiles you can place on the grid without overlapping.

Points There are two test sets:

- 1. For the first set, worth 50 points, you may assume that $w \leq 10$.
- 2. For the second set, worth 50 points, there are no additional constraints.

Sample input	Sample output
2	1
5 5	2
0 0 0 0 0	
0 0 1 1 0	
0 1 1 1 0	
0 1 1 1 0	
0 0 0 0 0	
5 6	
0 0 0 0 0	
0 0 1 1 0 0	
0 1 1 1 1 0	
0 1 1 1 1 0	
0 0 0 0 0	