

Problem 238: Set the Stage

Difficulty: Medium

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Problem Background

While actors and actresses get paid the most in movies and theater productions, their performances wouldn't be nearly as impressive without the support of a huge number of people behind the scenes. Lighting and sound technicians, set designers, and the stage managers that coordinate all of their efforts can turn a bland recital into a blockbuster sensation. Properly setting the scene is critical to ensuring an excellent performance.

This is just as true for small productions as big ones. To that end, your local community center needs your help working out if they have enough parts to build stages for various productions.

Problem Description

The stages are built from three basic components:

1 square meter frames, which come in two heights: 1 meter and 0.25 meters.



1 square meter deck panels, which fit on top of the frames and make the stage floor.



Stages can be built to different heights by stacking the frames on top of each other. Each stack, regardless of height, will need a single deck panel placed on top. Depending on the type of performance, the stage may need to have different widths from front to back and could have varying heights. Unfortunately, the stage crew don't always know if they'll have enough components to build the desired stages. That's where you come in!

You'll need to write a program that can read a planned stage design and calculate how many of each component will be needed to build the stage and determine whether there are enough of each part remaining in the inventory. If you run out of 1-meter-high frames, you may need to use leftover quarter-meter-high frames to make up for the shortfall; however, quarter-meter-high frames should

first be used to fill in height increments of less than a meter, since meter-high frames cannot replace quarter-meter-high frames. If you also run out of quarter-meter-high frames while doing this replacement, complete as many missing meter-high frames as possible, then report the remaining shortfall of meter-high frames. Areas of the stage with a height of zero meters do not require any components, including a deck panel.

Sample Input

The first line of your program's input, received from the standard input channel, will contain a positive integer representing the number of test cases. Each test case will include:

- A line containing two positive integers, Y and X, separated by a comma, representing the maximum depth and width of the stage in meters, respectively.
- A line containing three non-negative integers, separated by commas, representing the current stock of deck panels, meter-high frames, and quarter-meter-high frames, respectively.
- Y lines, each containing up to X non-negative numbers separated by commas, representing the height of each square meter section of the stage. For lines that contain fewer than X numbers, assume a height of 0 meters for any remaining sections in that row.

```
3
4,8
25,4,35
0,1,1,1,1,1,1,0
0,0.75,0.75,0.75,0.75,0.75,0.75,0
0,0.5,0.5,0.5,0.5,0.5,0.5,0
0.25,0.25,0.25,0.25,0.25,0.25,0.25,0.25
5,7
35,10,55
1.25,1.25,1.25,1.25,1.25,1.25,1.25
1,1,1,1,1,1,1
0.75,0.75,0.75,0.75,0.75,0.75,0.75
0.5,0.5,0.5,0.5,0.5,0.5,0.5
0.25,0.25,0.25,0.25,0.25,0.25,0.25
3,6
20,10,18
1,1,1,1,1,1
1,1,1,1,1,1
1,1,1,1,1,1
```

Sample Output

For each test case, your program must print a single line containing the following information for each type of stage component:

- The number of components of that type that must be used from the existing inventory
- A space

- Within parenthesis, the number of spare components of that type left over after the stage is built. If there were not enough in inventory, report any shortfall as a negative value.

Separate each report with a comma. Report deck panels first, then meter-high frames, then quarter-meter-high frames.

25 (-1), 4 (-2), 35 (-3)

35 (0), 10 (-3), 53 (2)

18 (2), 10 (-4), 16 (2)