Problem 4

Shortest Time in the Maze

The maze in this case is a rectangular building with rooms which can be depicted as horizontal rows and vertical columns in a table.

For example:

25	30	12	0	77
12	56	65	0	22
14	13	7	8	33
55	22	18	44	0

This maze has 4 rows and 5 columns, with the first row and first column in the upper left corner of the table.

The value associated with each room is the number of seconds it takes to travel through the room. **A room with the value of zero may not be traveled through.**

Your job is to find the quickest route from a given room in the maze to a given exit. The given exit will be one of the rooms on the perimeter of the building. One can only travel through the building by going to rooms that are adjacent (above, below, left or right) to the room that you are in. Traveling to a room on a diagonal to the current room is not permitted. You must include the time for the "starting" room and the "exit" room.

In the above example, let's say that you start in the room that is in the third row and fourth column, and that the exit is located in the room that is in the first row and second column. Your quickest route would be through the rooms with times 8, 7, 13, 14, 12, 25, and 30, for a total time of 109 seconds.

The input file (DATA4) will contain five sets of data. Each set will contain the following information:
- the first line will contain the number of rows, r, and columns, c, of the table that represents the maze of rooms. $1<=r<=20$ and $1<=c<=20$. The values r and c are separated by a single space.
- the next r lines will contain c integer values, s, that specify the number of seconds it takes to travel through the room. $0<=s<=10000$. There is a single space between each value, s.
- the r+2 line will contain the row and column of the room to start in separated by a single space. The starting room will not have a value of zero.
- the r+3 line will contain the row and column of the room that contains the exit separated by a single space. The exit room will not have a value of zero.

The output file (OUT4) will contain five lines of data, corresponding to each set of the input file. Each line will contain the quickest time from the starting room to the exit. The time must be displayed in hours, minutes and seconds in the form HH:MM:SS. If a path does not exist to the exit output the time 99:99:99.

Sample Input (Two sets of data given)

```
4 5
25 30 12 0 77
12 56 65 0 22
14 13 7 8 33
55 22 18 44 0
3 4
1 2
6 7
12 100 36 74 56 12 24
22 0 22 13 78 93 12
14 90 0 0 22 16 55
18 22 33 44 89 1010 0
32 43 56 78 87 87 62
12 0 33 433 0 88 39
5 5
1 1
```

Sample Output

```
00:01:49
00:05:30
```