IOI Training Camp 2013 – Test 4, 4 May, 2013

Divisor Jumping

You are given a grid A of M rows and N columns where each cell contains an integer value. From a location (i, j) in the grid, you may *jump* to a different location using the following rule: You may move to any of the cells $(i - d, j)$, $(i, j - d)$, $(i - d, j - d)$ provided d ($d \geq 1$) divides both i and j (and you stay within the limits of the grid).

Your aim is to reach the cell $(0, 0)$ using a sequence of such jumps. Starting from any given cell, there may be several ways of doing so. The *value* of a sequence leading to $(0, 0)$ is the sum of the values in the cells visited during that jump sequence (the sum includes the values at the starting cell and at $(0, 0)$). The aim is to choose a sequence that maximizes this value.

In this problem your aim is to do the following: given a grid as described above and a sequence of Q starting positions you must report, for each starting position, the maximum possible value of any sequence of jumps leading to $(0, 0)$.

Input format

- The first line consists of three space-separated integers M, N and Q, the dimensions of the grid and the number of questions respectively.
- The next M lines contain N space separated integers each. This constitutes the grid A.
- The subsequent Q lines contain two space separated integers corresponding to the locations (r, c) of the query.

Output format

Q lines, each line containing the answer to the corresponding query.

Test data

In all subtasks, $Q \leq MN$, $0 \leq r < M$, $0 \leq c < N$

- Subtask 1 (10 marks) : $M, N \leq 7$, $|A[i][j]| \leq 100,000$ for all $0 \leq i < M$ and $0 \leq j < N$.
- Subtask 2 (15 marks) : $M, N \leq 500$, $A[i][j] = -1$ for all $0 \leq i < M$ and $0 \leq j < N$.
- Subtask 3 (15 marks) : $M, N \leq 500$, $A[i][j] = 1$ for all $0 \leq i < M$ and $0 \leq j < N$.
- Subtask 4 (60 marks) : $M, N \leq 500$, $|A[i][j]| \leq 100,000$ for all $0 \leq i < M$ and $0 \leq j < N$.

Sample input

```
3 3 4
0 -1 -2
1 2 -3
-3 1 0
2 2
0 0
1 0
1 2
```

Sample output

```
4
0
1
0
```

Limits

- *Memory limit* : 128 MB
- *Time limit* : 4s