The PCB Problem

locked

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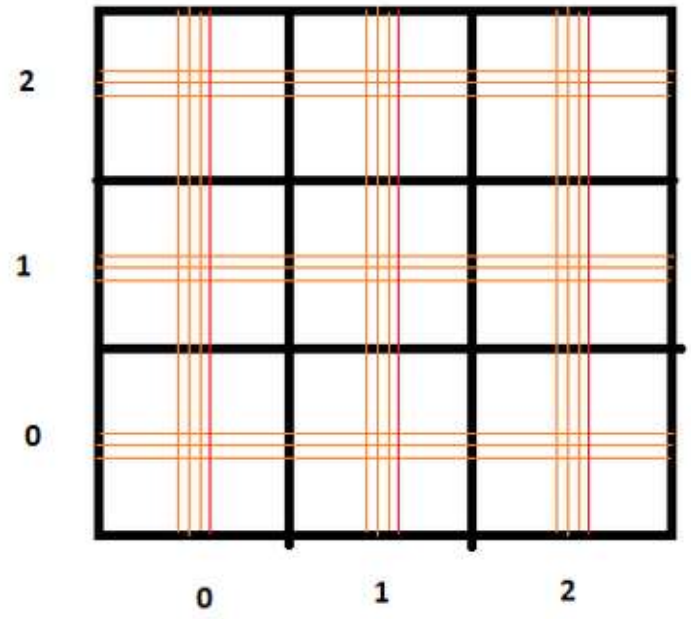
A generic, dual-layer printed circuit board (PCB), designed for high speed digital electronics applications is divided into M rows and N columns. Each square can have only one componented mounted in it. Each square has (Nht) number of horizontal, and (Nvt) number of vertical copper traces passing under them. Once components are mounted, connectivity can be established by vias in each square. Traces will not share connectivity, i.e. a trace path will connect only two components.

Due to design constraints and manufacturing defects, signal delays incur from traces between each two squares. Delay between each two squares for horizontal direction is given by a matrix of size M x (N -1), and the delays between each two squares in vertical direction is given by matrix of size (M-1) x N.



M = 3
N = 3
Nht = 3
Nvt = 4

5	4
3	2
7	5

Horizontal delay matrix.
"7" is the delay from
square (0,0) to (1,0)

3	5	2
4	8	1

Vertical delay matrix.
"5" is delay from
square (1,2) to (1,1)

Given a set of connections to be created for a given design, an algorithm is required to find the best possible (least delay) trace route for each connection. Connections are served FCFS, i.e first connection should be treated and given the best route.

Input Format

3 3 // Number of rows and columns in the board, 3 rows, 3 columns
3 4 // 3 horizontal traces and 4 vertical traces per square
5 4 // beginning of horizontal delay matrix
3 2
7 5
3 5 2 // beginning of vertical delay matrix
4 8 1

0,0 0,2 // connection required from square (0,0) to square (0,2) (x,y coordinate notation)

Constraints

row count M >= 2 column count N >= 2 Nht >= 1, Nvt >= 1

Output Format

0,0 0,1 0,2 // suggested connection from (0,0) to (0,2) via square (0,1)
NC // No connection can be made for the second connection given in input file

Sample Input 0

```
3 3
1 1
5 1
5 2
4 6
6 8 1
7 3 5

0,0 2,2
0,0 2,2
0,0 2,2
```

Sample Output 0

```
0,0 1,0 1,1 2,1 2,2
0,0 0,1 0,2 1,2 2,2
NC
```

C++

```cpp
#include <cmath>
#include <cstdio>
#include <vector>
#include <iostream>
#include <algorithm>
using namespace std;


int main() {
    /* Enter your code here. Read input from STDIN. Print output to STDOUT */
    return 0;
}

```

Line: 1 Col: 1

Upload Code as File Test against custom input Run Code Submit Code