

Problem G

Mosaic Browsing

Time limit: 6 seconds

The International Center for the Preservation of Ceramics (ICPC) is searching for motifs in some ancient mosaics. According to the ICPC's definition, a *mosaic* is a rectangular grid where each grid square contains a colored tile. A *motif* is similar to a mosaic but some of the grid squares can be empty. Figure G.1 shows an example motif and mosaic.

The rows of an $r_q \times c_q$ mosaic are numbered 1 to r_q from top to bottom, and the columns are numbered 1 to c_q from left to right.

A contiguous rectangular subgrid of the mosaic matches the motif if every tile of the motif matches the color of the corresponding tile of the subgrid. Formally, an $r_p \times c_p$ motif appears in an $r_q \times c_q$ mosaic at position (r, c) if for all $1 \leq i \leq r_p$, $1 \leq j \leq c_p$, the tile $(r + i - 1, c + j - 1)$ exists in the mosaic and either the square (i, j) in the motif is empty or the tile at (i, j) in the motif has the same color as the tile at $(r + i - 1, c + j - 1)$ in the mosaic.

Given the full motif and mosaic, find all occurrences of the motif in the mosaic.



Figure G.1: Motif (left) and mosaic (right) of Sample Input 1.

Input

The first line of input contains two integers r_p and c_p , where r_p and c_p ($1 \leq r_p, c_p \leq 1000$) are the number of rows and columns in the motif. Then r_p lines follow, each with c_p integers in the range $[0, 100]$, denoting the color of the motif at that position. A value of 0 denotes an empty square.

The next line of input contains two integers r_q and c_q where r_q and c_q ($1 \leq r_q, c_q \leq 1000$) are the number of rows and columns in the mosaic. Then r_q lines follow, each with c_q integers in the range $[1, 100]$, denoting the color of the mosaic at that position.



Output

On the first line, output k , the total number of matches. Then output k lines, each of the form $r\ c$ where r is the row and c is the column of the top left tile of the match. Sort matches by increasing r , breaking ties by increasing c .

Sample Input 1

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

Sample Output 1

```
3
1 1
1 3
2 2
```