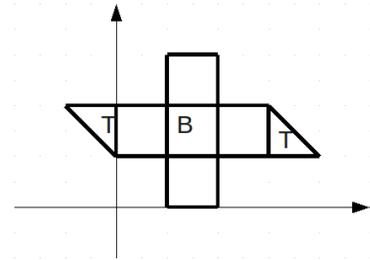


C Cube Folding (cube.{c,cc,java})

C.1 Description

Amy is assembling packing boxes from Adhesive Cube Manufacturers, and she needs your help. These packing boxes start out as a single piece of cardboard, creased so that when properly folded, they turn into a cube. All of the outer edges are treated with adhesive so that the cube will stay intact when folded up. Unfortunately, the company seems to have some...variety...in their templates for making these, so while each piece of cardboard is guaranteed to fold exactly into a cube, each piece does so differently, in some cases very much so. One section of the piece is always marked as belonging to the bottom face of the cube. To help Amy out, can you identify which sections belong to the top?

We can think of such a piece of cardboard as a collection of polygons that share edges. Unshared edges correspond to the outer edge of the cardboard, while shared edges correspond to creases. This means that each polygon belongs to exactly one face, and that polygons that share an edge belong to adjacent faces of the cube.



C.2 Input

The input consists of multiple test cases. Each test case begins with two integers V and P on a single line. $14 \leq V \leq 10^5, 6 \leq P \leq 10^5$. That line is followed by V lines with two integers x_i and y_i each, denoting that vertex i is at (x_i, y_i) . $-10^9 \leq x_i, y_i \leq 10^9$ for all i . After those lines are P lines, each consisting of a single integer n_j followed by n_j integers p_{jk} , denoting the n_j vertices of polygon j in clockwise order. $3 \leq n_j \leq 10^6$ for all j . Both vertices and polygons are 0-indexed. The first polygon given (polygon 0) belongs to the bottom face.

All polygons are such that each edge intersects none of the V vertices other than its two endpoints. All polygons are simple, and no two polygons have any overlapping area. Shared edges between polygons correspond to portions of edges on the folded cube. The given set of polygons, when folded along its shared edges, is guaranteed to fold exactly into a cube.

The last test case will be followed by $V = P = 0$, which should not be processed.

For example:

```
14 7
0 1
0 2
1 0
1 1
1 2
1 3
2 0
2 1
2 2
2 3
3 1
3 2
4 1
-1 2
4 3 4 8 7
4 0 1 4 3
4 2 3 7 6
4 4 5 9 8
```

```
4 7 8 11 10
3 10 11 12
3 13 1 0
0 0
```

C.3 Output

For each test case, print on a single line the number of polygons that belong to the top face of the cube. For example:

```
2
```