ACSL

**2005 - 2006** **American Computer Science League** **Contest #4**

**Intermediate Division**

PATHWAYS

PROBLEM: Given a set of ordered pairs that represent the nodes of a graph, determine the number of paths that exist between two nodes. Note that each node may be visited just once in each path. A path is defined here as a vertical or horizontal move from one node to an adjacent node.

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | x | | | | |
| 2 | | x | x | | |
| 3 | | x | x | | |
| 4 | | | x | x | |
| 5 | x | | | x | x |

INPUT: There will be 6 lines of input. The first line will contain a list of non-negative integers that in pairs represent the location of nodes in the graph. The list will end with 0,0 which is not a location. The remaining 5 lines will each contain 4 positive integers representing a starting and ending ordered pair. Line #1 in the Sample Input represents the graph above.

OUTPUT: For each of the last five lines of input print the number of paths that connect the start and end nodes if a path exists. If no path exists print NONE.

SAMPLE INPUT

1. 1,1,2,2,2,3,3,2,3,3,4,3,4,4,5,4,5,5,5,1,0,0
2. 2,2,4,3
3. 2,2,5,1
4. 3,2,5,5
5. 3,3,5,5

SAMPLE OUTPUT

1. 2
2. NONE
3. 2
4. 1