

Junior Division

PATHWAYS

PROBLEM: Given a set of ordered pairs that represent the nodes of a graph, determine if a simple path exists between two of the nodes. A simple path is a path with no node repeated.

	1	2	3	4	5
1	x				
2		x			
3		x			
4			x	x	
5	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 ordered pairs that connect the start and end nodes if a simple path exists. ACSL guarantees that at most one simple path will exist. If no simple path exists print NONE.

SAMPLE INPUT

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

SAMPLE OUTPUT

1. 2,2,3,2,4,3
2. NONE
3. 3,2,4,3,4,4,5,5