Problem 1: Happy Together

A massively multiplayer online role-playing (MMORG) game features several towns that players can visit, where each town is connected to zero or more other towns by routes. To make the game more interesting, the map of towns and the routes between them is randomly regenerated every month. Each time a map is regenerated, the game designers need to make sure that no matter where a player starts, there are sufficient routes to ensure he or she will be able visit all towns.

Write a program which, given a description of a map with r routes linking t towns, determines if all towns can be reached either directly or indirectly from any other town. The towns are represented by integers from 0 to t-1, inclusive. Your input will be an (r+1)-line textfile, in which the first line contains the values of t and r and each of the subsequent r lines specifies a route in terms of the pair of integer-codes of the two towns that this route links. You may assume that all input files are formatted correctly.

Sample input #1 (available as file "test1a.dat"):

54 01

23

0 2

34

Sample output #1:

Towns are all connected

Sample input #2 (available as file "test1b.dat"):

54

0 1

23

4 2

34

Sample output #2:

Towns are not connected

Sample input #3 (available as file "test1c.dat"):

 $\begin{array}{ccccccc} 11 & 12 \\ 10 & 4 \\ 6 & 3 \\ 9 & 7 \\ 8 & 6 \\ 0 & 8 \\ 9 & 2 \\ 10 & 6 \\ 9 & 4 \\ 10 & 5 \\ 6 & 0 \\ 8 & 2 \\ 3 & 1 \end{array}$

Sample output #3:

Towns are all connected