Worksheet #20: Sequential->Parallel Spanning Tree Algorithm

Name: _______________________________          Netid: _________________

1. Insert finish, async, and isolated constructs (pseudocode is fine) to convert the sequential spanning tree algorithm from the other side into a parallel algorithm.

2. Is it better to use a global isolated or an object-based isolated construct for the parallelization in question 1? If object-based is better, which object(s) should be included in the isolated list?
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1. class V {
2.   V [] neighbors; // adjacency list for input graph
3.   V parent; // output value of parent in spanning tree
4.   
5.   boolean makeParent(V n) {
6.     if (parent == null) { parent = n; return true; }
7.     else return false; // return true if n became parent
8.   } // makeParent
9.   
10.  void compute() {
11.     for (int i=0; i<neighbors.length; i++) {
12.       final V child = neighbors[i];
13.       if (child.makeParent(this))
14.         child.compute(); // recursive call
15.     }
16.   } // compute
17. } // class V
18. . . . // main program
19. root.parent = root; // Use self-cycle to identify root
20. root.compute();
21. . . .