

Worksheet #20: Parallel Spanning Tree Algorithm

Name: _____

Netid: _____

1. Insert `finish`, `async`, and `isolated` constructs (pseudocode is fine) to convert the sequential spanning tree algorithm below 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?



Sequential Parallel Spanning Tree Algorithm

```
1. class V {
2.     V [] neighbors; // adjacency list for input graph
3.     V parent; // output value of parent in spanning tree

4.     boolean makeParent(V n) {
5.         if (parent == null) { parent = n; return true; }
6.         else return false; // return true if n became parent
7.     } // makeParent

8.     void compute() {
9.         for (int i=0; i<neighbors.length; i++) {
10.             final V child = neighbors[i];
11.             if (child.makeParent(this))
12.                 child.compute(); // recursive call
13.         }
14.     } // compute
15. } // class V
16. . . . // main program
17. root.parent = root; // Use self-cycle to identify root
18. root.compute();
19. . . .
```

