Self-stabilizing α-maximal-partitioning
Group 43
Shivneshwar Velayutham and Madhumitha Venkatesan

Pseudocode

```
processor_logic()
do forever:
        temp_set = my_set

        if i am not in my set:
                temp_set = me
        if size(temp_set) > alpha // ensures that size is never greater than alpha
                temp_set = me
        if check_if_set_is_a_connected_tree(me, temp_set) is false
                temp_set = me

        for every neighbor:
                if neighbor in temp_set and I am not in neighbor.set and
size(neighbor.set) >= size(temp_set)
                        // ensures that there is no intersection between partitions
                        temp_set = me
                        // assigns my set to me since neighbor's set is larger
                if neighbor.set has me and size(neighbor.set) > size(temp_set)
                        temp_set = neighbor.set
                if neighbor is not my temp_set and neighbor.set does not contain
me and size(temp_set) + size(neighbor.set) <= alpha
                        // unions two sets to ensure that this is a maximal paritition
                        temp_set = temp_set + neighbor.set
        end
my_set = temp_set
end
```

As you can see from the algorithm that no partition is empty will at least have one element. Other properties of the partitioning are reached and explained with the help of the comments in the pseudocode above.

check_if_set_is_a_connected_tree(root, set) // bfs algorithm

```
for each p in set:
        explored[p] = false
end
explored[root] = true
q = empty queue
q.enqueue(root)
while q is not null:
        tmp = q.dequeue()
        for each neighbor n of tmp:
                if n belongs to set and explored[n] = false
                        explored[n] = true
                        q.enqueue(n)
        end
end
if explored contains one false
        return false
else
        return true
```

The above functions helps when the configuration loaded is bad one has elements in the set that do not form a tree. The above is done using bfs algorithm. Thus the algorithm will stabilize with any starting system configuration.