The University of Melbourne
School of Computing and Information Systems
COMP90020 Distributed Algorithms

Tutorial Week 6: Leader Election

Notes

Exercises

25. In the Bully algorithm, a recovering process starts an election and will become the new coordinator if it has a higher identifier than the current incumbent. Is this a necessary feature of the algorithm?

26. Suggest how to adapt the Bully algorithm to deal with temporary network partitions (slow communication) and slow processes.

27. Assume that processes do not have a unique identifier (as previously assumed) and are instead anonymous. Is there a deterministic election algorithm for leader election in a ring of $n > 1$ processes? Provide a counter-example or provide such an algorithm..

28. The problem of leader election has some similarities with the mutual exclusion problem. Last week we discussed Maekawa's distributed mutual exclusion algorithm with $O(\sqrt{n})$ message complexity. Can we use similar ideas to design a leader election algorithm with sub-linear message complexity?

29. In a hypercube of n nodes, suggest an algorithm for leader election with a message complexity of $O(n \cdot \log n)$.