Distributed Algorithms

Fall 2019

NBAC & TRB
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Exercise 1 - NBAC & Weak Termination

Devise an algorithm that, without consensus, implements a weaker specification of NBAC by replacing the termination property with

Weak termination: Let *p* be a distinguished process, known to all other processes. If *p* does not crash then all correct processes eventually decide.

Your algorithm may use a perfect failure detector.

Exercise 2 - NBAC & Very Weak Termination

Devise an algorithm that, without consensus, implements a weaker specification of NBAC by replacing the termination property with

Very weak termination: If no process crashes, then all processes decide.

Is a failure detector needed to implement this algorithm?

Exercise 3 - TRB & ◇P

Can we implement TRB with an eventually perfect failure detector ◇P, under the assumption that at least one process can crash?

Exercise 4 - TRB to Consensus

Design an algorithm that implements consensus using multiple TRB instances.

Exercise 5 - TRB to Total Order Broadcast

Design an algorithm that implements Total Order Broadcast using multiple TRB instances.