

Exercise Session 8

Shared Memory

Problem 2

Explain why every process needs to maintain a copy of the register value in the “Majority Voting” algorithm (Either Algorithm 4.2 in the book, or ABD95 algorithm from slides).

Solution

The algorithm also needs to maintain a copy of the register value at all processes, even if we assume only one reader. Assume that some process q does not maintain a copy. Assume, furthermore, that the writer updates the value of the register: it can do so only by accessing a majority of the processes. If q is in that majority, then the writer would have stored the value in a majority of the processes minus one. It might happen that all processes in that majority, except for q , crash. But the set of remaining processes plus q also constitute a majority. A subsequent read in this majority might not return the last value written.