# Beyond classical chip design
# Exercise II

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**Ex 6.** Does Dijkstra's algorithm work with a distributed scheduler and $V = [n-1]$? Prove your answer.

**Ex 7.** Prove Proposition 2: The full-reversal algorithm on the line fulfills no deadlock (i.e., there is always at least one sink) in all executions generated by a distributed scheduler from arbitrary initial states. Is "no deadlock" a safety or liveness property?

**Ex 8.** Prove Proposition 3: The full-reversal algorithm on the line fulfills weak fairness (i.e., every node infinitely often is a sink) in all executions generated by a distributed scheduler from arbitrary initial states. Is "weak fairness" a safety or liveness property?

**Ex 9.** Study executions of the full-reversal algorithm on the line generated by a distributed scheduler from arbitrary initial states. What do you observe on the number of sinks over time (constant, decreasing, increasing, ...)? Can you explain your observations? [You might want to write simulation programs for this in your favorite language.]

**Ex 10.** Prove ($A$ simulates $B$) $\rightarrow$ ($B$ implements $A$).