Justin Mang 556002335 - Mutual Exclusion - Assignment 3 - CMPT 477 Summer 2018

Assumptions About the Environment:

- 1. A waitlist must empty before taking on a new process.
- 2. Waitlist 1 empties when its process can enter its critical state.
- 3. Waitlisted processes can only move up, via FIFO stack.
- 4. An empty waitlist can remain empty if no process is in a trying state.
- 5. A process will not remain in its critical section infinitely.
- 6. A process will attempt to enter its critical state.

Modelling Decisions:

A process that is trying will eventually become critical

SPEC

$$AG(pr1.st = t) \rightarrow AF(pr1.st = c)$$

SPEC

$$AG(pr2.st = t) \rightarrow AF(pr2.st = c)$$

SPEC

$$AG(pr3.st = t) \rightarrow AF(pr3.st = c)$$

A process that is in non-critical will eventually try

SPEC

$$AG ((pr1.st = n) \rightarrow EX(pr1.st = t))$$

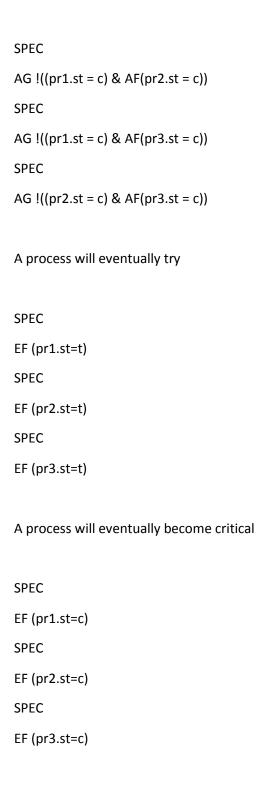
SPEC

$$AG ((pr2.st = n) \rightarrow EX(pr2.st = t))$$

SPEC

$$AG ((pr3.st = n) -> EX(pr3.st = t))$$

Only one process can be in its critical section at a time



Additional Properties:

A waitlist cannot hold identical processes

SPEC

SPEC

SPEC

Verification Time for Properties:

< 0.5 seconds