

This file contains the abstract program *FGSqs* of Section 3.2.3 of the book “A Science of Concurrent Programs” by *Leslie Lamport*.

The formulas *Init* and *Next* describe the initial predicate and step predicate.

EXTENDS *Integers*

VARIABLES x, y, pc

$$\begin{aligned} Init \triangleq & \quad \wedge x = 1 \\ & \quad \wedge y = 1 \\ & \quad \wedge pc = \text{“a”} \end{aligned}$$

$$\begin{aligned} Next \triangleq & \quad \text{IF } pc = \text{“a”} \text{ THEN } \wedge x' = x + y + 2 \\ & \quad \wedge y' = y \\ & \quad \wedge pc' = \text{“b”} \\ & \quad \text{ELSE } \wedge x' = x \\ & \quad \wedge y' = y + 2 \\ & \quad \wedge pc' = \text{“a”} \end{aligned}$$

Formula *Inv* is defined as for program *Sqs*, except with *yy* substituted for *y*.

$$\begin{aligned} yy \triangleq & \quad \text{IF } pc = \text{“a”} \text{ THEN } y \text{ ELSE } y + 2 \\ Inv \triangleq & \quad \wedge (x \in Nat) \wedge (y \in Nat) \wedge (pc \in \{\text{“a”}, \text{“b”}\}) \\ & \quad \wedge yy \% 2 = 1 \\ & \quad \wedge x = ((yy + 1) \div 2)^2 \end{aligned}$$

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