

MODULE *ICenSet2*

This module defines the program *ICenSet2* described in Section 7.4.3.2 of “A Science of Concurrent Programs” by *Leslie Lamport*. It is imported by the root module *ICenSet1*.

EXTENDS *Integers, Sequences*

CONSTANT *Art, NotArt*

VARIABLES *inp, aw, disp, old*
 $v \triangleq \langle inp, aw, disp, old \rangle$

$TypeOKSet \triangleq \wedge inp \in Art \cup \{NotArt\}$
 $\wedge disp \in Art \times \{0, 1\}$
 $\wedge aw \subseteq Art$
 $\wedge old \subseteq Art$

$InitSet \triangleq \wedge inp = NotArt$
 $\wedge aw = \{\}$
 $\wedge disp \in Art \times \{0, 1\}$
 $\wedge old = \{\}$

$InpOrNotSet \triangleq \wedge inp = NotArt$
 $\wedge inp' \in Art \setminus old$
 $\wedge \vee aw' = aw \cup \{inp'\}$
 $\vee aw' = aw$
 $\wedge old' = old \cup \{inp'\}$
 $\wedge disp' = disp$

$AckSet \triangleq \wedge inp \in Art$
 $\wedge inp' = NotArt$
 $\wedge UNCHANGED \langle aw, disp, old \rangle$

$DisplaySet \triangleq \exists w \in aw :$
 $\wedge disp' = \langle w, 1 - disp[2] \rangle$
 $\wedge aw' = aw \setminus \{w\}$
 $\wedge UNCHANGED \langle inp, old \rangle$

$NextSet2 \triangleq InpOrNotSet \vee AckSet \vee DisplaySet$

$ICenSet2 \triangleq InitSet \wedge \Box[NextSet2]_v$

Although not done in the book, we define the fairness requirement for the *ICenSet2* program. It is weak fairness of all the actions except the *InpOrNotSet* action, since we don't want to require that the artist keep submitting works of art.

$Fairness2 \triangleq WF_v(AckSet \vee DisplaySet)$

$ICenSet2 \triangleq InitSet \wedge \Box[NextSet2]_v \wedge Fairness2$

\ * Modification History

\ * Last modified *Fri Oct 18 15:19:53 CEST 2024* by *lamport*

* Created Sat Oct 22 07:58:56 PDT 2022 by lamport