MODULE *Alternation*

EXTENDS *Sequences*, *Integers*

$Put(s) \triangleq Append(s, \text{“widget”})$

$Get(s) \triangleq Tail(s)$

VARIABLES $b2$, $box2$

$vars2 \triangleq \langle b2, box2 \rangle$

$$\begin{aligned} Init2 \triangleq\ & \wedge b2 = 0 \\ & \wedge box2 = \langle\rangle \end{aligned}$$

$$\begin{aligned} Producer2 \triangleq\ & \wedge b2 = 0 \\ & \wedge box2' = Put(box2) \\ & \wedge b2' = 1 \end{aligned}$$

$$\begin{aligned} Consumer2 \triangleq\ & \wedge b2 = 1 \\ & \wedge box2' = Get(box2) \\ & \wedge b2' = 0 \end{aligned}$$

$Next2 \triangleq Producer2 \vee Consumer2$

$Spec2 \triangleq Init2 \wedge \Box[Next2]_{vars2}$

$Invariant2 \triangleq Len(box2) \leq 1$

```
**************************************************************************
--algorithm Alternate{
    variable b = 0, box = ⟨⟩ ;
    process ( Producer = 0 )
    { p1: while ( TRUE )
        { await b = 0 ;
          box := Put(box) ;
          b := 1 ;
        }
    }

   fair process ( Consumer = 1 )
    { c1: while ( TRUE )
        { await b = 1 ;
          box := Get(box) ;
          b := 0 ;
        }
    }
}
**************************************************************************
```

BEGIN TRANSLATION ($chksum(pcal) =$ “$4b985bc0$” $\wedge\ chksum(tla) =$ “$ae3ada3a$”)

VARIABLES b, box

$vars \triangleq \langle b,\ box \rangle$

$ProcSet \triangleq \{0\} \cup \{1\}$

$Init \triangleq$ Global variables
$\land\ b = 0$
$\land\ box = \langle\rangle$

$Producer \triangleq \land\ b = 0$
$\land\ box' = Put(box)$
$\land\ b' = 1$

$Consumer \triangleq \land\ b = 1$
$\land\ box' = Get(box)$
$\land\ b' = 0$

$Next \triangleq Producer \lor Consumer$

$Spec \triangleq Init \land \Box[Next]_{vars}$

END TRANSLATION

* Modification History
* Last modified *Mon Oct* 04 11:32:02 *CST* 2021 by *wrz*
* Created *Wed Sep* 29 10:18:30 *CST* 2021 by *wrz*