MODULE *Session3*

EXTENDS *Integers*, *Sequences*, *TLC*

```
********
--algorithm TupleMax{
   variables inp = ⟨1, 3, 2⟩,  max = −99999, i = 1;
   {
     assert  ∀ n ∈ 1 .. Len(inp) : inp[n] > −99999;
     while ( i ≤ Len(inp) ) {
       if ( inp[i] > max ) { max := inp[i] } ;
       i := i + 1
      } ;
     assert     (∃ n ∈ 1 .. Len(inp) : max = inp[n])
              ∧  (∀ n ∈ 1 .. Len(inp) : max ≥ inp[n])
    }
 }
*******
```

BEGIN TRANSLATION ($chksum(pcal) =$ "$d2f21b4f$" $\land\ chksum(tla) =$ "$faaa532a$")

VARIABLES inp, max, i, pc

$vars \triangleq \langle inp,\ max,\ i,\ pc\rangle$

$Init \triangleq$ Global variables

$\land\ inp = \langle 1, 3, 2\rangle$
$\land\ max = -99999$
$\land\ i = 1$
$\land\ pc =$ "Lbl_1"

$Lbl\_1 \triangleq$ $\land\ pc =$ "Lbl_1"
$\land\ Assert(\forall\, n \in 1 \,..\, Len(inp) : inp[n] > -99999,$
"Failure of assertion at line 9, column 6.")
$\land\ pc' =$ "Lbl_2"
$\land$ UNCHANGED $\langle inp,\ max,\ i\rangle$

$Lbl\_2 \triangleq$ $\land\ pc =$ "Lbl_2"
$\land$ IF $i \le Len(inp)$
THEN $\land$ IF $inp[i] > max$
THEN $\land\ max' = inp[i]$
ELSE $\land$ TRUE
$\land\ max' = max$
$\land\ i' = i + 1$
$\land\ pc' =$ "Lbl_2"
ELSE $\land\ Assert(\ (\exists\, n\ \in 1 \,..\, Len(inp) : max = inp[n])$
$\land\ (\forall\, n \in 1 \,..\, Len(inp) : max \ge inp[n]),$
"Failure of assertion at line 14, column 6.")
$\land\ pc' =$ "Done"

$\land$ UNCHANGED $\langle max,\ i\rangle$
$\land\ inp' = inp$

Allow infinite stuttering to prevent deadlock on termination.

$Terminating \triangleq pc = \text{“Done”} \land \text{UNCHANGED } vars$

$Next \triangleq Lbl\_1 \lor Lbl\_2 \lor Terminating$

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

$Termination \triangleq \Diamond(pc = \text{“Done”})$

END TRANSLATION

* Modification History
* Last modified *Wed Jan* 10 23:19:39 *CET* 2024 by *alexander*
* Last modified Sat *Dec* 26 11:48:57 *PST* 2020 by *claus*
* Created *Fri Dec* 25 00:00:00 *PST* 2020 by *claus*