MODULE *appex2_2*

EXTENDS *Naturals*, *TLC*, *Integers*
CONSTANTS x, min, max
VARIABLES $y1$, $y2$, z, pc
$D \triangleq min \,..\, max$
ASSUME $x \in D$

$start \triangleq pc = \text{“START”} \land y1' = x \land y2' = 1 \land pc' = \text{“LOOP”} \land \text{UNCHANGED } \langle z \rangle$

$case1 \triangleq$
$\land pc = \text{“LOOP”} \land y1 \leq 100$
$\land y1' = y1 + 11 \land y2' = y2 + 1$
$\land \text{UNCHANGED } \langle z, pc \rangle$

$case2 \triangleq$
$\land pc = \text{“LOOP”} \land y1 > 100$
$\land pc' = \text{“h”}$
$\land \text{UNCHANGED } \langle z, y1, y2 \rangle$

$case21 \triangleq$
$\land pc = \text{“h”} \land y2 \neq 1$
$\land y1' = y1 - 10 \land y2' = y2 - 1$
$\land pc' = \text{“LOOP”}$
$\land \text{UNCHANGED } \langle z \rangle$

$case22 \triangleq$
$\land pc = \text{“h”} \land y2 = 1$
$\land z' = y1 - 10 \land pc' = \text{“HALT”}$
$\land \text{UNCHANGED } \langle y1, y2 \rangle$

$ePrint \triangleq pc = \text{“HALT”} \land PrintT(z) \land \text{UNCHANGED } \langle y1, y2, z, pc \rangle$

$Next \triangleq start \lor case1 \lor case2 \lor case21 \lor case22 \lor \text{UNCHANGED } \langle y1, y2, z, pc \rangle \lor ePrint$
$init1 \triangleq y1 \in Int \land y2 \in Int \land z \in Int \land pc = \text{“START”}$
$Init \triangleq y1 = 0 \land y2 = 0 \land z = 0 \land pc = \text{“START”}$

$Q1 \triangleq pc \neq \text{“HALT”}$ c prned la valeur *HALT*
$Q2 \triangleq pc = \text{“HALT”} \Rightarrow z = \text{IF } x > 100 \text{ THEN } x - 10 \text{ ELSE } 91$

$Qy1 \triangleq min \leq y1 \land y1 \leq max$
$Qef \triangleq y1 \in D \land y2 \in D \land z \in D$
$Question \triangleq Q2 \land Qef$