MODULE *appex2_2*

Calcul de la fonction de *MacCarthy*

EXTENDS *Naturals*, *TLC*, *Integers*

CONSTANTS x, max, u

$min \triangleq -max$

VARIABLES $y1$, $y2$, z, pc

$BF(X) \triangleq X \neq u \Rightarrow X \in min \,..\, max$

ASSUME $BF(x)$

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

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

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

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

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

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

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

$Q1 \triangleq pc \neq \text{“HALT”}$ c prned la valeur *HALT*

$Qpartialcorrectness \triangleq pc = \text{“HALT”} \Rightarrow z = \text{IF } x > 100 \text{ THEN } x - 10 \text{ ELSE } 91$

$Qy1 \triangleq BF(y1)$
$Qrte \triangleq BF(y1) \land BF(y2) \land BF(z)$
$Question \triangleq Qpartialcorrectness \land Qrte$

$QQ \triangleq 0 \leq y2 \land y2 \leq 2$

$test \triangleq QQ$