

MODULE *appex2_2*

Calcul de la fonction de *MacCarthy*
EXTENDS *Naturals*, *TLC*, *Integers*

CONSTANTS x, max, u
 $min \triangleq -max$

VARIABLES $y1, y2, z, pc$

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

ASSUME $BF(x)$

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

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

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

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

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

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

$Next \triangleq start \vee case1 \vee case2 \vee case21 \vee case22 \vee \text{UNCHANGED } \langle y1, y2, z, pc \rangle \vee ePrint$

$init1 \triangleq y1 \in \text{Int} \wedge y2 \in \text{Int} \wedge z \in \text{Int} \wedge pc = \text{"START"}$

$Init \triangleq y1 = u \wedge y2 = u \wedge z = u \wedge pc = \text{"START"}$

$Q1 \triangleq pc \neq \text{"HALT"} \quad$ c prned la valeur *HALT*
 $Q_{partialcorrectness} \triangleq pc = \text{"HALT"} \Rightarrow z = \text{IF } x > 100 \text{ THEN } x - 10 \text{ ELSE } 91$

$Qy1 \triangleq BF(y1)$
 $Qrte \triangleq BF(y1) \wedge BF(y2) \wedge BF(z)$
 $Question \triangleq Q_{partialcorrectness} \wedge Qrte$

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

$test \triangleq QQ$
