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|----- MODULE appex2_2 -----|
|  Calcul de la fonction de MacCarthy |
|  EXTENDS Naturals, TLC, Integers |
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|  CONSTANTS x, max, u |
|  min  $\triangleq$   $-max$  |
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|  VARIABLES y1, y2, z, pc |
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|  BF(Y)  $\triangleq$   $Y \neq u \Rightarrow Y \in min .. max$  |
|  ASSUME BF(x) |
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|  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  $\triangleq$  |
|     $\wedge pc = \text{"OBS"} \wedge y2 = 1$  |
|     $\wedge z' = y1 - 10 \wedge pc' = \text{"HALT"}$  |
|     $\wedge \text{UNCHANGED } \langle y1, y2 \rangle$  |
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|  ePrint  $\triangleq$   $pc = \text{"HALT"} \wedge PrintT(z) \wedge \text{UNCHANGED } \langle y1, y2, z, pc \rangle$  |
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|  Next  $\triangleq$   $start \vee case1 \vee case2 \vee case21 \vee case22 \vee \text{UNCHANGED } \langle y1, y2, z, pc \rangle \vee ePrint$  |
|  init1  $\triangleq$   $y1 \in Int \wedge y2 \in Int \wedge z \in Int \wedge pc = \text{"START"}$  |
|  Init  $\triangleq$   $y1 = u \wedge y2 = u \wedge z = u \wedge pc = \text{"START"}$  |
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$Q1 \triangleq pc \neq \text{"HALT"}$  c prned la valeur *HALT*  
 $Q_{\text{partialcorrectness}} \triangleq pc = \text{"HALT"} \Rightarrow z = \text{IF } x > 100 \text{ THEN } x - 10 \text{ ELSE } 91$   
 $Qy1 \triangleq BF(y1)$   
 $Qrte \triangleq BF(y1) \wedge BF(y2) \wedge BF(z)$   
 $Question \triangleq Q_{\text{partialcorrectness}} \wedge Qrte$   
 $QQ \triangleq 0 \leq y2 \wedge y2 \leq 2$   
 $test \triangleq QQ$

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