$\overline{}$ MODULE spa $\overline{}$

EXTENDS $Naturals$

CONSTANT max_num_q

VARIABLE $num,\ count\_right,\ count\_wrong,\ result,\ input\_enabled,\ check\_enabled,\ new\_question\_enabled$

$vars \triangleq \langle num,\ count\_right,\ count\_wrong,\ result,\ input\_enabled,\ check\_enabled,\ new\_question\_enabled\rangle$

$Init \triangleq \ \wedge\ num = 1$
$\qquad\qquad \wedge\ count\_right\ \ = 0$
$\qquad\qquad \wedge\ count\_wrong = 0$
$\qquad\qquad \wedge\ input\_enabled = \text{TRUE}$
$\qquad\qquad \wedge\ check\_enabled = \text{FALSE}$
$\qquad\qquad \wedge\ new\_question\_enabled = \text{FALSE}$
$\qquad\qquad \wedge\ result = \text{``''}$

$Input\_Answer \triangleq \ \wedge\ input\_enabled = \text{TRUE}$
$\qquad\qquad\qquad\quad \wedge\ input\_enabled' = \text{FALSE}$
$\qquad\qquad\qquad\quad \wedge\ check\_enabled' = \text{TRUE}$
$\qquad\qquad\qquad\quad \wedge\ \text{UNCHANGED}\ \langle num,\ count\_right,\ count\_wrong,\ new\_question\_enabled,\ result\rangle$

$Check \triangleq \ \wedge\ check\_enabled = \text{TRUE}$
$\qquad\qquad \wedge\ check\_enabled' = \text{FALSE}$
$\qquad\qquad \wedge\ new\_question\_enabled' = \text{TRUE}$
$\qquad\qquad \wedge\ \exists\ answer\_correct \in \{\text{TRUE, FALSE}\} : \text{IF}\ answer\_correct = \text{TRUE THEN}$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \wedge\ count\_right' = count\_right + 1$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \wedge\ result' = \text{``Right''}$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \wedge\ \text{UNCHANGED}\ count\_wrong$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \text{ELSE} \ \ \wedge\ count\_wrong' = count\_wrong + 1$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \wedge\ \text{UNCHANGED}\ count\_right$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \wedge\ result' = \text{``Wrong''}$
$\qquad\qquad\qquad \wedge\ \text{UNCHANGED}\ \langle num,\ input\_enabled\rangle$

$New\_Question \triangleq \ \wedge\ num < max\_num\_q$
$\qquad\qquad\qquad\quad \wedge\ new\_question\_enabled = \text{TRUE}$
$\qquad\qquad\qquad\quad \wedge\ new\_question\_enabled' = \text{FALSE}$
$\qquad\qquad\qquad\quad \wedge\ num' = num + 1$
$\qquad\qquad\qquad\quad \wedge\ input\_enabled' = \text{TRUE}$
$\qquad\qquad\qquad\quad \wedge\ result' = \text{``''}$
$\qquad\qquad\qquad\quad \wedge\ \text{UNCHANGED}\ \langle count\_right,\ count\_wrong,\ check\_enabled\rangle$

$Terminating \triangleq \ \wedge\ num = max\_num\_q$
$\qquad\qquad\qquad \wedge\ \text{UNCHANGED}\ vars$

$Next \triangleq \ \vee\ Input\_Answer$
$\qquad\qquad \vee\ Check$

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$\qquad \lor \; New\_Question$

$\qquad \lor \; Terminating$

$Spec \;\triangleq\; Init \land \Box[Next]_{vars} \land \mathrm{WF}_{vars}(Next)$

\ * Modification History
\ * Last modified *Tue Jan* 17 19:47:09 *CET* 2023 by *martin*
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