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MODULE *appex2\_1*

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EXTENDS *Naturals, TLC*  
 VARIABLES *M*  
 CONSTANT *T*  
 $Places \triangleq \{ \text{"p11"}, \text{"p21"}, \text{"p22"}, \text{"p12"}, \text{"p31"}, \text{"p33"}, \text{"p0"} \}$

**condition de *t1***  
 $t1 \triangleq$   
 $\wedge M[\text{"p11"}] \geq 1 \wedge M[\text{"p12"}] \geq 1 \wedge M[\text{"p0"}] \geq 1$   
 $\wedge M' = [ [ [ [ M \text{ EXCEPT } ![\text{"p11"}] = @ - 1]$   
 $\text{EXCEPT } ![\text{"p12"}] = @ - 1]$   
 $\text{EXCEPT } ![\text{"p21"}] = @ + 1]$   
 $\text{EXCEPT } ![\text{"p31"}] = @ + 1]$   
 $\text{EXCEPT } ![\text{"p0"}] = @ - 1]$

$t2 \triangleq$   
 $\wedge M[\text{"p21"}] \geq 1$   
 $\wedge M' = [ [ [ M \text{ EXCEPT } ![\text{"p21"}] = @ - 1]$   
 $\text{EXCEPT } ![\text{"p22"}] = @ + 2]$   
 $\text{EXCEPT } ![\text{"p11"}] = @ + 1]$

$t3 \triangleq$   
 $\wedge M[\text{"p31"}] \geq 1$   
 $\wedge M' = [ [ [ M \text{ EXCEPT } ![\text{"p31"}] = @ - 1]$   
 $\text{EXCEPT } ![\text{"p33"}] = @ + 1]$   
 $\text{EXCEPT } ![\text{"p12"}] = @ + 1]$

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$Init \triangleq M = [p \in Places \mapsto \text{IF } p \in \{ \text{"p11"}, \text{"p12"} \} \text{ THEN } 1 \text{ ELSE } 0]$   
 $Next \triangleq t1 \vee t2 \vee t3 \vee M' = M$

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$Q \triangleq M[\text{"p11"}] = 1 \wedge M[\text{"p12"}] = 1 \Rightarrow 2 * M[\text{"p33"}] = M[\text{"p22"}]$

$Q1 \triangleq M[\text{"p22"}] \neq 32$

$Q2 \triangleq M[\text{"p21"}] = 1 \wedge M[\text{"p31"}] = 1 \Rightarrow M[\text{"p22"}] = 2 * M[\text{"p33"}]$

$test \triangleq Q2$

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