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MODULE *appex2\_1*

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

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

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

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

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

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

$Q1 \triangleq M["p22"] \neq 32$

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

$test \triangleq Q2$

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