TrafficLight

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Mathematic definition

$C = (P, T, I, O)$
$P = \{L1R, L1G, L1Y, L2R, L2G, L2Y, L34R, L34G, L34Y\}$
$T = \{ab, bc, cd, de, ea\}$
$I(ab) = \{L1R, L34R\}$ $O(ab) = \{L1G, L34G\}$
$I(bc) = \{L34G\}$ $O(bc) = \{L34Y\}$
$I(cd) = \{L2R, L34Y\}$ $O(cd) = \{L2G, L34R\}$
$I(de) = \{L1G, L2G\}$ $O(de) = \{L1Y, L2Y\}$
$I(ea) = \{L1Y, L2Y\}$ $O(ea) = \{L1R, L2R\}$
The initial marking is: $\mu = (1, 0, 0, 1, 0, 0, 1, 0, 0)$

The definition of all colsets

```
colset DATA = string;
var c,c': DATA;
fun TransColor(c:DATA) = (case c of
 "Red" => 1"Green"| "Green" => 1"Yellow"
 | "Yellow" => 1"Red");
```

State space analysis

```
Statistics
------------------------------------------------------------------------

State Space
Nodes:  5
Arcs:   5
Secs:   0
Status: Full

Scc Graph
Nodes:  1
Arcs:   0
Secs:   0
```

```
14
15
16 Boundedness Properties
17 ----------------------------------------------------------------------------
18
19 Best Integer Bounds
20 Upper        Lower
21 TrafficLight'L1G 1        1              0
22 TrafficLight'L1R 1        1              0
23 TrafficLight'L1Y 1        1              0
24 TrafficLight'L2G 1        1              0
25 TrafficLight'L2R 1        1              0
26 TrafficLight'L2Y 1        1              0
27 TrafficLight'L34G 1       1              0
28 TrafficLight'L34R 1       1              0
29 TrafficLight'L34Y 1       1              0
30
31 Best Upper Multi-set Bounds
32 TrafficLight'L1G 1   1"Green"TrafficLight'L1R 1 1"Red"
33 TrafficLight'L1Y 1   1"Yellow"TrafficLight'L2G 1 1"Green"
34 TrafficLight'L2R 1   1"Red"TrafficLight'L2Y 1 1"Yellow"
35 TrafficLight'L34G 1  1"Green"TrafficLight'L34R 1 1"Red"
36 TrafficLight'L34Y 1  1"Yellow"Best Lower Multi-set BoundsTrafficLight'L1G
   1 emptyTrafficLight'L1R 1 emptyTrafficLight'L1Y 1 emptyTrafficLight'L2G 1 emp-
   tyTrafficLight'L2R 1 emptyTrafficLight'L2Y 1 emptyTrafficLight'L34G 1 empty-
   TrafficLight'L34R 1 emptyTrafficLight'L34Y 1 emptyHome Properties----------
   ----------Home MarkingsAllLiveness Properties-----------------------------
   ----------Dead MarkingsNoneDead Tran-
   sition InstancesNoneLive Transition InstancesAllFairness Properties--------
   ----------Impartial Transition InstancesTrafficLight'ab
   1TrafficLight'bc 1TrafficLight'cd 1TrafficLight'de 1TrafficLight'ea 1Fair Transition
   InstancesNoneJust Transition InstancesNoneTransition Instances with No Fairness-
   None
```