

# TrafficLight

## Mathematic definition

$C = (P, T, I, O)$

$P = \{L1R, L1G, L1Y, L2R, L2G, L2Y, L34R, L34G, L34Y\}$

$T = \{ab, bc, cd, de, ea\}$

$I(ab) = \{L1R, L34R\} \quad O(ab) = \{L1G, L34G\}$

$I(bc) = \{L34G\} \quad O(bc) = \{L34Y\}$

$I(cd) = \{L2R, L34Y\} \quad O(cd) = \{L2G, L34R\}$

$I(de) = \{L1G, L2G\} \quad O(de) = \{L1Y, L2Y\}$

$I(ea) = \{L1Y, L2Y\} \quad O(ea) = \{L1R, L2R\}$

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

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State Space

Nodes: 5

Arcs: 5

Secs: 0

Status: Full

Scc Graph

Nodes: 1

Arcs: 0

Secs: 0

Boundedness Properties

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Best Integer Bounds

Upper Lower

TrafficLight'L1G 1 1 0

TrafficLight'L1R 1 1 0

TrafficLight'L1Y 1 1 0

TrafficLight'L2G 1	1	0
TrafficLight'L2R 1	1	0
TrafficLight'L2Y 1	1	0
TrafficLight'L34G 1	1	0
TrafficLight'L34R 1	1	0
TrafficLight'L34Y 1	1	0

#### Best Upper Multi-set Bounds

TrafficLight'L1G 1	1`"Green"
TrafficLight'L1R 1	1`"Red"
TrafficLight'L1Y 1	1`"Yellow"
TrafficLight'L2G 1	1`"Green"
TrafficLight'L2R 1	1`"Red"
TrafficLight'L2Y 1	1`"Yellow"
TrafficLight'L34G 1	1`"Green"
TrafficLight'L34R 1	1`"Red"
TrafficLight'L34Y 1	1`"Yellow"

#### Best Lower Multi-set Bounds

TrafficLight'L1G 1	empty
TrafficLight'L1R 1	empty
TrafficLight'L1Y 1	empty
TrafficLight'L2G 1	empty
TrafficLight'L2R 1	empty
TrafficLight'L2Y 1	empty
TrafficLight'L34G 1	empty
TrafficLight'L34R 1	empty
TrafficLight'L34Y 1	empty

#### Home Properties

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##### Home Markings

All

#### Liveness Properties

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##### Dead Markings

None

##### Dead Transition Instances

None

##### Live Transition Instances

All

#### Fairness Properties

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##### Impartial Transition Instances

TrafficLight'ab 1
TrafficLight'bc 1
TrafficLight'cd 1
TrafficLight'de 1

TrafficLight'ea 1

Fair Transition Instances

None

Just Transition Instances

None

Transition Instances with No Fairness

None