

# LAB 1 Traffic Light

## Group 12

Machine:

```
MACHINE
  lightChange
SEES
  ◦ Context1
VARIABLES
  ◦ light1
  ◦ light2
INVARIANTS
  ◦ inv1: light1 ∈ Colors not theorem
  ◦ inv2: light2 ∈ Colors not theorem
  ◦ inv3: ¬(light1 = green ∧ light2 = green) not theorem
EVENTS
  ◦ INITIALISATION: not extended ordinary
    THEN
      ◦ act1: light1 = red
      ◦ act2: light2 = red
    END

  ◦ redToYellow1: not extended ordinary
    WHERE
      ◦ grd1: light1 = red not theorem
    THEN
      ◦ act1: light1 = yellow
    END

  ◦ redToYellow2: not extended ordinary
    WHERE
      ◦ grd1: light2 = red not theorem
    THEN
      ◦ act1: light2 = yellow
    END

  ◦ yellowToGreen1: not extended ordinary
    WHERE
      ◦ grd1: light1 = yellow not theorem
      ◦ grd2: light2 ≠ green not theorem
    THEN
      ◦ act1: light1 = green
    END

  ◦ yellowToGreen2: not extended ordinary
    WHERE
      ◦ grd1: light2 = yellow not theorem
      ◦ grd2: light1 ≠ green not theorem
    THEN
      ◦ act1: light2 = green
    END

  ◦ greenToRed1: not extended ordinary
    WHERE
      ◦ grd1: light1 = green not theorem
    THEN
      ◦ act1: light1 = red
    END

  ◦ greenToRed2: not extended ordinary
    WHERE
      ◦ grd1: light2 = green not theorem
    THEN
```

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◦ greenTored2: not extended ordinary >
WHERE
◦ grd1: light2=green not theorem >
THEN
◦ act1: light2=red >
END
END

```

Context:

```

CONTEXT
  Context1 >
SETS
◦ Colors >
CONSTANTS
◦ red >
◦ green >
◦ yellow >
AXIOMS
◦ axm1: red ∈ Colors not theorem >
◦ axm2: green ∈ Colors not theorem >
◦ axm3: yellow ∈ Colors not theorem >
◦ axm4: partition(Colors,{red},{green},{yellow}) not theorem >
END

```

Proof Obligations:

```

▼ TrafficLight
  ▼ Context1
    > Carrier Sets
    > Constants
    > Axioms
    ✓ Proof Obligations
  ▼ lightChange
    > Variables
    > Invariants
    > Events
    ▼ ✓ Proof Obligations
      ✓ INITIALISATION/inv3/INV
      ✓ redToyellow1/inv3/INV
      ✓ redToyellow2/inv3/INV
      ✓ yellowTogreen1/inv3/INV
      ✓ yellowTogreen2/inv3/INV
      ✓ greenTored1/inv3/INV
      ✓ greenTored2/inv3/INV

```