

MODULE *traffic_light*

VARIABLE *color*

$AcceptableColor \triangleq color \in \{\text{"red"}, \text{"green"}, \text{"yellow"}\}$

$AlwaysAcceptableColor \triangleq \Box AcceptableColor$

(for use as spec PROPERTY, in lieu of INVARIANT, meaning state “must always be an acceptable color”)

$Init \triangleq color = \text{"red"}$

$TurnGreen \triangleq$
 $\wedge color = \text{"red"}$
 $\wedge color' = \text{"green"}$

$TurnYellow \triangleq$
 $\wedge color = \text{"green"}$
 $\wedge color' = \text{"yellow"}$

$TurnRed \triangleq$
 $\wedge color = \text{"yellow"}$
 $\wedge color' = \text{"red"}$

$Next \triangleq$
 $\vee TurnGreen$
 $\vee TurnYellow$
 $\vee TurnRed$

$Spec \triangleq Init \wedge \Box [Next]_{color}$

(this formula can, as SPECIFICATION, replace *INIT*/NEXT declaration in the model config)