MODULE *HourClock*

EXTENDS *Naturals*, *FiniteSets*, *TLC*

VARIABLES *hr*

$Init \triangleq hr \in 1 \,..\, 12$

$Next \triangleq \lor (hr < 12 \land hr' = hr + 1)$
$\quad\quad\quad \lor (hr = 12 \land hr' = 1)$

$Spec \triangleq Init \land \Box[Next]_{\langle hr \rangle} \land \mathrm{WF}_{\langle hr \rangle}(Next)$ prevent stuttering forever

---

The clock MUST show 1-12 hours on the display
$Corr1 \triangleq hr \geq 1 \land hr \leq 12$

The clock MUST not stop
$Corr2 \triangleq ((hr = 12) \rightsquigarrow (hr = 1)) \land \forall\, n \in 1 \,..\, 11 : (hr = n) \rightsquigarrow (hr = n + 1)$

$Corr3 \triangleq (hr = 12) \rightsquigarrow (hr = 1)$

$Corr \triangleq Corr1 \land Corr2$ $\land\, Corr3$