MACHINE
tictac
VARIABLES
square, *turn*
INVARIANT
$turn \in (0..1)$
$\wedge\ square \in ((1\ldots3) \times (1\ldots3)) \pfun (0\ldots1)$
DEFINITIONS
$win(p) ==$
$(\ \exists\ x.(x \in 1\ldots3 \wedge \forall\ y.(y \in 1\ldots3 \Rightarrow (x \mapsto y) \mapsto p \in square)))$
$\vee\ (\ \exists\ y.(y \in 1\ldots3 \wedge \forall\ x.(x \in 1\ldots3 \Rightarrow (x \mapsto y) \mapsto p \in square)))$
$\vee\ (\ \forall\ x.(x \in 1\ldots3 \Rightarrow (x \mapsto x) \mapsto p \in square))$
$\vee\ (\ \forall\ x.(x \in 1\ldots3 \Rightarrow (x \mapsto (4\text{-}x)) \mapsto p \in square));$
INITIALISATION
$turn,square := 0, \emptyset$
OPERATIONS
place0$(xx,yy) =$
PRE
$turn = 0 \wedge$
$xx{:}(1\ldots3) \wedge yy{:}(1\ldots3) \wedge$
$xx \mapsto yy \notin \mathbf{dom}(square)$
THEN
$\mathbf{square}(xx \mapsto yy) := 0\ ||$
$turn := 1$
END ;
place1$(xx,yy) =$
PRE
$turn = 1 \wedge$
$xx{:}(1\ldots3) \wedge yy{:}(1\ldots3) \wedge$
$xx \mapsto yy \notin \mathbf{dom}(square)$
THEN
$\mathbf{square}(xx \mapsto yy) := 1\ ||$
$turn := 0$
END
END