MODULE GCD

EXTENDS $Integers$
CONSTANTS M, N
VARIABLES x, y
$PositiveInteger \triangleq$ CHOOSE $i : i \in Nat \land i \neq 0$

$$TypeInvariant \triangleq \quad x \in PositiveInteger \land y \in PositiveInteger$$

Estado inicial

$$Init \triangleq (x = M) \land (y = N)$$

Proximo estado da computacao

$$Next \triangleq \quad ((x < y) \land (x' = x) \land (y' = y - x)) \lor ((y < x) \land (y' = y) \land (x' = x - y))$$

$$Spec \triangleq Init \land \Box[Next]_{\langle x, y \rangle}$$

THEOREM $Spec \Rightarrow TypeInvariant$