MODULE *leftpad*

EXTENDS TLC, $Integers$, $Sequences$

$Seqs(s,\ n) \triangleq$ UNION $\{[1\ ..\ m \to s] : m \in 1\ ..\ n\}$

$Max(a,\ b) \triangleq$ IF $a > b$ THEN a ELSE b

$Leftpad(padding,\ padded\_size,\ str) \triangleq$
LET
$padded\_length \triangleq Max(Len(str),\ padded\_size)$
$pad\_length \triangleq$ CHOOSE $l \in 0\ ..\ padded\_size :$
$l + Len(str) = padded\_length$
IN
$[x \in 1\ ..\ pad\_length \mapsto padding] \circ str$

VARIABLES
$unpadded$,
$padded$,
$padding$,
pc

$vars \triangleq \langle unpadded,\ padded,\ padding,\ pc\rangle$

$Init \triangleq$
$\land\ unpadded \in Seqs(\{\text{“a”},\ \text{“b”},\ \text{“c”},\ \text{“d”}\},\ 5)$
$\land\ padding \in 1\ ..\ 10$
$\land\ padded = \text{“”}$
$\land\ pc = \text{“init”}$

$LP \triangleq$
$\land\ pc = \text{“init”}$
$\land\ padded' = Leftpad(\text{“ ”},\ padding,\ unpadded)$
$\land\ pc' = \text{“done”}$
$\land$ UNCHANGED $\langle unpadded,\ padding\rangle$

$Done \triangleq$
$\land\ pc = \text{“done”}$
$\land$ UNCHANGED $vars$

$Next \triangleq LP \lor Done$

$PaddedEndsUpWithUnpadded \triangleq$
$\land\ (pc = \text{“done”}) \Rightarrow \forall\ i \in 0\ ..\ Len(unpadded) - 1 : unpadded[Len(unpadded) - i] = padded[Len(padded$

$PaddedHasAtLeastPadLength \triangleq$

$\land\ (pc = \text{“done”}) \Rightarrow Len(padded) \geq padding$

$IfPaddedIsLargerThanUnpaddedItMustBeginWithPad \triangleq$
$\land\ (Len(padded) > Len(unpadded)) \Rightarrow padded[1] = \text{“ ”}$