
MODULE *BufferStateSpace*

The buffer (*i.e.*, sequence) representation of state space used in *AJupiter*, *NJupiter* and *GJupiter*.
This module defines generalized *OT* functions on operation sequences.

EXTENDS *Naturals*, *SequenceUtils*

RECURSIVE $xFormOpOps(-, -, -)$ Transform *op* against an operation sequence *ops*.
 $xFormOpOps(xform(-, -), op, ops) \triangleq$
IF $ops = \langle \rangle$ THEN $\langle op \rangle$ Maintain and return the intermediate transformed operations.
ELSE $\langle op \rangle \circ xFormOpOps(xform, xform(op, Head(ops)), Tail(ops))$

$xFormOpsOp(xform(-, -), ops, op) \triangleq$ Transform an operation sequence *ops* against *op*.
LET $opX \triangleq xFormOpOps(xform, op, ops)$
IN $[i \in 1 \dots Len(ops) \mapsto xform(ops[i], opX[i])]$

$xFormFull(xform(-, -), op, ops) \triangleq$
 $[xop \mapsto Last(xFormOpOps(xform, op, ops)),$
 $xops \mapsto xFormOpsOp(xform, ops, op)]$

$xFormShift(xform(-, -), op, ops, shift) \triangleq$ shift of *ops*
 $xFormFull(xform, op, SubSeq(ops, shift + 1, Len(ops)))$

$xFormAppend(xform(-, -), op, ops, pos) \triangleq$ after *xform, op* will be appended to *ops*
LET $xformResult \triangleq xFormShift(xform, op, ops, pos)$
IN $[xop \mapsto xformResult.xop,$
 $xops \mapsto SubSeq(ops, 1, pos) \circ xformResult.xops \circ \langle xformResult.xop \rangle]$

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