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MODULE OT
Specification of OT (Operational Transformation) functions.
EXTENDS OpOperators, SetUtils

xFormII(lins, rins) ≜  lins is transformed against rins
    IF lins.pos < rins.pos
     THEN lins
     ELSE IF lins.pos > rins.pos
             THEN [lins EXCEPT !.pos = @ + 1]
             ELSE IF lins.ch = rins.ch
                     THEN Nop
                     ELSE IF lins.pr > rins.pr
                             THEN [lins EXCEPT !.pos = @ + 1]
                             ELSE lins

xFormID(ins, del) ≜  ins is transformed against del
    IF ins.pos ≤ del.pos
     THEN ins
     ELSE [ins EXCEPT !.pos = @ − 1]

xFormDI(del, ins) ≜  del is transformed against ins
    IF del.pos < ins.pos
     THEN del
     ELSE [del EXCEPT !.pos = @ + 1]

xFormDD(ldel, rdel) ≜  ldel is transformed against rdel
    IF ldel.pos < rdel.pos
     THEN ldel
     ELSE IF ldel.pos > rdel.pos
             THEN [ldel EXCEPT !.pos = @ − 1]
             ELSE Nop

xForm(lop, rop) ≜  lop is transformed against rop
    CASE lop = Nop ∨ rop = Nop → lop
       □ lop.type = "Ins" ∧ rop.type = "Ins" → xFormII(lop, rop)
       □ lop.type = "Ins" ∧ rop.type = "Del" → xFormID(lop, rop)
       □ lop.type = "Del" ∧ rop.type = "Ins" → xFormDI(lop, rop)
       □ lop.type = "Del" ∧ rop.type = "Del" → xFormDD(lop, rop)

\* Modification History
\* Last modified Sat Jan 12 20:14:40 CST 2019 by hengxin
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