MODULE *SendSeq*

This module and modules *SendSeqUndo* and *SendSeqUndoP* form the *SendSeq* example from Section 4.4 of the paper "Auxiliary Variables in TLA+". It is a variant of the *SendSet* example in modules *SendSet*, *SendSetUndo*, and *SendSetUndoP*. The difference between the two examples is that the value of variable y in *SendSet* is a set of data values that may be sent in any order. In the current *SendSeq* example, the value of y is a sequence of data values that are to be sent in order. The $Undo(S)$ action of *SendSetUndo* that removes the set S of data values from the set y is replaced in *SendSeqUndo* by an $Undo(i)$ action that removes element number i from the sequence y.

If you understand module *SendSet*, you should have no problem understanding the current module.

EXTENDS *Sequences*, *Integers*

CONSTANT *Data*

$NonData \triangleq \text{CHOOSE } v : v \notin Data$

VARIABLES x, y

$vars \triangleq \langle x, y \rangle$

$$TypeOK \triangleq \begin{array}{l} \land\, x \in Data \cup \{NonData\} \\ \land\, y \in Seq(Data) \end{array}$$

$$Init \triangleq (x = NonData) \land (y = \langle\rangle)$$

$$Choose \triangleq \begin{array}{l} \land\, \exists\, d \in Data : y' = Append(y,\, d) \\ \land\, x' = x \end{array}$$

$$Send \triangleq \begin{array}{l} \land\, x = NonData \land y \neq \langle\rangle \\ \land\, x' = Head(y) \\ \land\, y' = Tail(y) \end{array}$$

$$Rcv \triangleq \begin{array}{l} \land\, x \in Data \\ \land\, x' = NonData \\ \land\, y' = y \end{array}$$

$$Next \triangleq Choose \lor Send \lor Rcv$$

$$Spec \triangleq Init \land \Box[Next]_{vars}$$

* Modification History
* Last modified *Wed Oct* 19 05:15:04 *PDT* 2016 by *lamport*
* Created *Thu Sep* 15 02:12:27 *PDT* 2016 by *lamport*