

0.0.1 Append

The operation *append* will return a Collection with a Value added at a specified numeric Index.

$append[Collection, V, \mathbb{N}_1]$ $coll?, coll! : Collection$ $v? : V$ $idx? : \mathbb{N}_1$ $append : Collection \times V \times \mathbb{N}_1 \rightarrow Collection$	_____
$coll! = append(coll?, v?, idx?) \bullet$ $let\ coll' == front(\{ i : \mathbb{N}_1 \mid i \in 0..idx? \} \upharpoonright coll?) \frown v?$ $coll'' == \{ j : \mathbb{N}_1 \mid j \in idx? .. \# coll? \} \upharpoonright coll? \bullet$ $= coll' \frown coll'' \Rightarrow front(coll') \frown v? \frown coll'' \wedge v? \mapsto idx? \in coll! \wedge \# coll! = \# coll? + 1$	

where *coll'* is the items in *coll?* up to *idx* but the value at *idx?* is replaced with *v?* and *coll''* is the items in *coll?* from *idx* to $\# coll?$ and is inclusive of $coll?_{idx?}$. The composition of the two Collections results in *coll!* which contains $idx? \mapsto v?$ and all subsequent $idx \mapsto v \in coll?$ are now $idx + 1 \mapsto v_{idx}$. The following example illustrates these properties.

$$\begin{aligned}
X &= \langle x_0, x_1, x_2 \rangle \\
x_0 &= 0 \\
x_1 &= foo \\
x_2 &= \langle a, b, c \rangle \\
v? &= bar \\
append(X, v?, 0) &= \langle bar, 0, foo, \langle a, b, c \rangle \rangle \\
append(X, v?, 1) &= \langle 0, bar, foo, \langle a, b, c \rangle \rangle \\
append(X, v?, 2) &= \langle 0, foo, bar, \langle a, b, c \rangle \rangle \\
append(X, v?, 3) &= \langle 0, foo, \langle a, b, c \rangle, bar \rangle
\end{aligned}$$