

### 0.0.1 Remove

The inverse of the *append* Operations.

$$\text{remove}(\text{coll}, \text{idx}) = \sim \text{append}(\text{coll}, \text{idx})$$

The operation *remove* will return a Collection minus the Value removed from the specified Numeric Index

$$\begin{array}{l} \text{Remove}[\text{Collection}, \mathbb{N}] \text{-----} \\ \text{coll?}, \text{coll!} : \text{Collection} \\ \text{idx?} : \mathbb{N} \\ \text{remove\_} : \text{Collection} \times \mathbb{N} \rightarrow \text{Collection} \\ \hline \# \text{idx?} = 1 \\ \text{coll!} = \text{remove}(\text{coll?}, \text{idx?}) \bullet \\ \text{let coll' == front}(\{i : \mathbb{N} \mid i \in 0 \dots \text{idx?}\} \upharpoonright \text{coll?}) \\ \text{coll'' == tail}(\{j : \mathbb{N} \mid j \in \text{idx?} \dots \# \text{coll?}\} \upharpoonright \text{coll?}) \\ = \text{coll'} \wedge \text{coll''} \Rightarrow \\ (\text{coll?}_{\text{idx?}} \notin \text{coll'}) \wedge \\ (\text{coll?}_{\text{idx?}} \notin \text{coll''}) \wedge \\ (\# \text{coll!} = \# \text{coll?} - 1) \end{array}$$

such that

$$\begin{array}{ll} X = \langle x_0, x_1, x_2 \rangle & \\ x_0 = 0 & \\ x_1 = \text{foo} & \\ x_2 = \text{baz} & \\ \text{remove}(X, 0) = \langle \text{foo}, \text{baz} \rangle & [0 \text{ was removed from } X] \\ \text{remove}(X, 1) = \langle 0, \text{baz} \rangle & [\text{foo was removed from } X] \\ \text{remove}(X, 2) = \langle 0, \text{foo} \rangle & [\text{baz was removed from } X] \\ \text{remove}(X, 3) = \langle 0, \text{foo}, \text{baz} \rangle = X & [\text{nothing at 3, } X \text{ unaltered}] \end{array}$$