Accompanying document for the list.sol implementation. Contains predicate logic style declarations for the post and pre conditions of the methods.
Is a work in progress and subject to change!

1 list.sol

1.1 Add

requires

(a) *nothing*

ensures

(a) $\text{array}[\text{array.length} - 1] = \text{num}$

(b) $\forall i.((i \leq 0 \land\ i < \text{array.length} - 1) \rightarrow \text{array}[i] = \text{old}(\text{array}[i]))$

(c) $\text{array.length} = \text{old}(\text{array.length}) + 1$

1.2 size

requires

(a) *nothing*

ensures

(a) $\text{ret} = \text{array.length}$

(b) $\forall i.((0 \leq i \land i < \text{array.length}) \rightarrow \text{array}[i] = \text{old}(\text{array}[i]))$

1.3 contains

requires

(a) *nothing*

ensures

(a) $\text{isContained} \rightarrow \exists i.(0 \leq i \land i < \text{array.length} \land \text{array}[i] = \text{num})$

(b) $\overline{\text{isContained}} \rightarrow \forall i.((0 \leq i \land i < \text{array.length}) \rightarrow \text{array}[i] \neq \text{num})$

1.4 remove

requires

(a) $\text{array.length} \geq 1$

(b) $\text{index} \geq 0 \land \text{index} < \text{array.length}$

ensures

(a) array.length = old(array.length) − 1

(b) $\forall i.((0 \leq i \wedge i < index) \rightarrow \text{array}[i] = \text{old}(\text{array}[i]))$

(c) $\forall i.((index \leq i \wedge i < \text{array.length}) \rightarrow \text{array}[i] = \text{old}(\text{array}[i+1]))$

(d) ret = old(array[*index*])

1.5 get

requires

(a) $0 \geq index \wedge index <$ array.length

ensures

(a) ret = array[*index*]

(b) $\forall i.((0 \leq i \wedge i < \text{array.length}) \rightarrow \text{array}[i] = \text{old}(\text{array}[i]))$