

184 Let  $L$  be a list-of-integers state variable (program variable)  $L: [*int]$ . Formalize the specification “sort list  $L$ ”.

After trying the question, scroll down to the solution.

§ First, I expand the informal specification as follows:  
(each integer occurs the same number of times as an item in  $L$  as it does in  $L'$ )  
 $\wedge$  ( $L'$  is monotonic)

Now formally:

$$\begin{aligned} & (\forall i: \text{int} \cdot \phi(\S j: \Box L \cdot L j = i) = \phi(\S j: \Box L' \cdot L' j = i)) \\ & \wedge (\forall i, j: \Box L' \cdot i \leq j \Rightarrow L' i \leq L' j) \end{aligned}$$