Inference at $*$ 1 2 2 2
of proof for Lemma append_overlapping_sublists:

1. T : Type
2. L_1 : T List
3. L_2 : T List
4. L : T List
5. x : T
6. $\forall i, j$:$\mathbb{N}$. $(i < \|L\|) \Rightarrow (j < \|L\|) \Rightarrow (\neg(i = j)) \Rightarrow (\neg(L[i] = L[j]))$
7. f_1 : $\{0..\|L_1$ @ $[x]\|^-\} \rightarrow \{0..\|L\|^-\}$
8. increasing(f_1;$\|L_1$ @ $[x]\|$)
9. $\forall j$:$\{0..\|L_1$ @ $[x]\|^-\}$. $(L_1$ @ $[x])[j] = L[(f_1(j))]$
10. f : $\{0..(\|L_2\|+1)^-\} \rightarrow \{0..\|L\|^-\}$
11. increasing(f;$\|L_2\|$+1)
12. $\forall j$:$\{0..(\|L_2\|+1)^-\}$. $[x$ / $L_2][j] = L[(f(j))]$
13. $\|L_1$ @ $[x$ / $L_2]\| = \|L_1\|+\|L_2\|+1$
14. $\|[]\| \geq 0$
15. j : $\{0..\|L_1$ @ $[x$ / $L_2]\|^-\}$

$\vdash (L_1$ @ $[x$ / $L_2])[j] = L[$if $j \leq$z $\|L_1\|$ then $f_1(j)$ else $f(j$ - $\|L_1\|)$ fi $]$

by InteriorProof ((((AssertBY $\|L_1$ @ $[x]\| = \|L_1\|+1$
((((RWO "length_append" 0)

CollapseTHEN (Reduce 0))·)
CollapseTHEN ((Auto_aux (first_nat 1:n
) ((first_nat 1:n),(first_nat 3:n)) (first_tok SupInf:t) inil_term)))·)

CollapseTHEN (SplitOnConclITE))·)
CollapseTHENA (
(Auto_aux (first_nat 1:n) ((first_nat 1:n),(first_nat 3:n)) (first_tok
:t) inil_term)))·

1: .....truecase..... NILNIL

16. $\|L_1$ @ $[x]\| = \|L_1\|+1$
17. $j \leq \|L_1\|$

$\vdash (L_1$ @ $[x$ / $L_2])[j] = L[(f_1(j))]$

2: .....falsecase..... NILNIL

16. $\|L_1$ @ $[x]\| = \|L_1\|+1$
17. $\|L_1\| < j$

$\vdash (L_1$ @ $[x$ / $L_2])[j] = L[(f(j$ - $\|L_1\|))]$

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http://www.nuprl.org/FDLcontent/p0_963683_/p122_84469_{append_overlapping_sublists}1_2_2_2.html