Inference at $*$
of proof for Lemma append_overlapping_sublists:

$\vdash \forall T$:Type, L_1, L_2, L:(T List), x:T.
no_repeats(T;L) $\Rightarrow$ L_1 @ $[x]$ $\subseteq$ L $\Rightarrow$ $[x$ / $L_2]$ $\subseteq$ L $\Rightarrow$ L_1 @ $[x$ / $L_2]$ $\subseteq$ L
by (((((((Auto_aux (first_nat 1:n) ((first_nat 1:n),(first_nat 3:n)) (first_tok :t
) inil_term))
CollapseTHEN (All (Unfolds "sublist no_repeats")))·)
CollapseTHEN (
All Reduce))·)
CollapseTHEN (ExRepD))·

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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. $\forall j{:}\{0..(\|L_2\|+1)^-\}.\ [x / L_2][j] = L[(f(j))]$

$\vdash \exists f{:}\{0..\|L_1$ @ $[x / L_2]\|^-\} \rightarrow \{0..\|L\|^-\}$
(increasing(f;$\|L_1$ @ $[x / L_2]\|$)
& ($\forall j{:}\{0..\|L_1$ @ $[x / L_2]\|^-\}.\ (L_1$ @ $[x / L_2])[j] = L[(f(j))]$))

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