Inference at $*$ 1 2 2 1
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. $\|[]\| \geq 0$

$\vdash$increasing(λi.if i $\leq$z $\|L_1\|$ then $f_1(i)$ else $f(i$ - $\|L_1\|)$ fi ;$\|L_1 \ @\ [x\ /\ L_2]\|$)
by InteriorProof (((((((((((((Unfold ‘increasing‘ 0)
CollapseTHEN (Reduce 0))·)

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

CollapseTHENA ((Auto_aux (first_nat 1:n) ((first_nat 1:n),(first_nat 3:n)) (first_tok SupInf:t) inil_term)))·)
CollapseTHEN (SplitOnConclITE))·)
CollapseTHEN ((Auto_aux (first_nat 1:n) ((first_nat 2:n),(first_nat 3:n)) (first_tok SupInf:t) inil_term)))·

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

15. i : $\{0..(\|L_1 \ @\ [x\ /\ L_2]\|$ - 1$)^-\}$
16. $i \leq \|L_1\|$
17. $(i$+1$) \leq \|L_1\|$

$\vdash$ $(f_1(i)) < (f_1(i$+1$))$

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

15. i : $\{0..(\|L_1 \ @\ [x\ /\ L_2]\|$ - 1$)^-\}$
16. $i \leq \|L_1\|$
17. $\|L_1\| < (i$+1$)$

$\vdash$ $(f_1(i)) < (f((i$+1$)$ - $\|L_1\|))$

3: .....falsecase..... NILNIL

15. i : $\{0..(\|L_1$ @ $[x\ /\ L_2]\|$ - $1)^-\}$
16. $\|L_1\| < i$
17. $\|L_1\| < (i+1)$
$\vdash$ $(f(i$ - $\|L_1\|)) < (f((i+1)$ - $\|L_1\|))$
.