Inference at $*$ 1 1
of proof for Lemma adjacent-append:

1. T : Type
2. x : T
3. y : T
4. L_1 : T List
5. L_2 : T List
6. i : $\{0..(\|L_1 @ L_2\| - 1)^-\}$
7. $x = (L_1 @ L_2)[i]$
8. $y = (L_1 @ L_2)[(i{+}1)]$
9. $i < \|L_1\|$

$\vdash (\exists i{:}\{0..(\|L_1\| - 1)^-\}.\ (x = L_1[i]\ \&\ y = L_1[(i{+}1)]))$
$\vee ((0 < \|L_1\|)\ \&\ (0 < \|L_2\|)\ \&\ x = \mathrm{last}(L_1)\ \&\ y = \mathrm{hd}(L_2))$
$\vee (\exists i{:}\{0..(\|L_2\| - 1)^-\}.\ (x = L_2[i]\ \&\ y = L_2[(i{+}1)]))$
by ((Decide $i < (\|L_1\| - 1)$)
CollapseTHENA (Auto·))·

1:

10. $i < (\|L_1\| - 1)$
$\vdash (\exists i{:}\{0..(\|L_1\| - 1)^-\}.\ (x = L_1[i]\ \&\ y = L_1[(i{+}1)]))$
$\vee ((0 < \|L_1\|)\ \&\ (0 < \|L_2\|)\ \&\ x = \mathrm{last}(L_1)\ \&\ y = \mathrm{hd}(L_2))$
$\vee (\exists i{:}\{0..(\|L_2\| - 1)^-\}.\ (x = L_2[i]\ \&\ y = L_2[(i{+}1)]))$

2:

10. $\neg(i < (\|L_1\| - 1))$
$\vdash (\exists i{:}\{0..(\|L_1\| - 1)^-\}.\ (x = L_1[i]\ \&\ y = L_1[(i{+}1)]))$
$\vee ((0 < \|L_1\|)\ \&\ (0 < \|L_2\|)\ \&\ x = \mathrm{last}(L_1)\ \&\ y = \mathrm{hd}(L_2))$
$\vee (\exists i{:}\{0..(\|L_2\| - 1)^-\}.\ (x = L_2[i]\ \&\ y = L_2[(i{+}1)]))$

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