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

$\vdash \forall T$:Type, x, y:T, L_1, L_2:(T List).
adjacent(T;L_1 @ L_2;x;y)
$\iff$ (adjacent(T;L_1;x;y)
$\vee$ (($0 < \|L_1\|$) & ($0 < \|L_2\|$) & $x = \text{last}(L_1)$ & $y = \text{hd}(L_2)$)
$\vee$ adjacent(T;L_2;x;y))
by ((RepUR"adjacent" 0)
CollapseTHEN (((MaAuto·)
CollapseTHEN (((ExRepD·)

CollapseTHEN (Auto'))·))·))·

1:

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

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

2:

1. T : Type
2. x : T
3. y : T
4. L_1 : T List
5. L_2 : T List
6. ($\exists i$:$\{0..(\|L_1\| - 1)^-\}$. ($x = L_1[i]$ & $y = L_1[(i+1)]$))
$\vee$ (($0 < \|L_1\|$) & ($0 < \|L_2\|$) & $x = \text{last}(L_1)$ & $y = \text{hd}(L_2)$)
$\vee$ ($\exists i$:$\{0..(\|L_2\| - 1)^-\}$. ($x = L_2[i]$ & $y = L_2[(i+1)]$))

$\vdash \exists i$:$\{0..(\|L_1 \text{ @ } L_2\| - 1)^-\}$. ($x = (L_1 \text{ @ } L_2)[i]$ & $y = (L_1 \text{ @ } L_2)[(i+1)]$)

3:

1. T : Type
2. T
3. T
4. L_1 : T List
5. L_2 : T List

6. $0 < \|L_1\|$
7. $0 < \|L_2\|$
$\vdash \neg(\uparrow \mathrm{null}(L_1))$

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http://www.nuprl.org/FDLcontent/p0_963683_/p39_372879_{adjacent-append}.html