See the proof for Theorem strorder_sublist_antisym in table 1

Table 1: Proof of Theorem strorder_sublist_antisym

Next step in Coq	Proof situation
$Proof.$	——— $\forall\ L\ K : List\ \mathbb{N},\ list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$
$prove\_by\_induction.$	Hidden 2 goal(s)
$+_{1/2}$	——— $\forall\ K : List\ \mathbb{N},\ list\_in\_strorder\ [] \to list\_in\_strorder\ K \to [] \subseteq K \to K \subseteq [] \to [] = \{List\ \mathbb{N}\}\ K$
$prove\_all\_imp\_star.$	$K\ : List\ \mathbb{N}$ $H\ : list\_in\_strorder\ []$ $H0\ : list\_in\_strorder\ K$ $H1\ : [] \subseteq K$ $H2\ : K \subseteq []$ ——— $[] = \{List\ \mathbb{N}\}\ K$
$exception\ H2.$	$K\ : List\ \mathbb{N}$ $H\ : list\_in\_strorder\ []$ $H0\ : list\_in\_strorder\ K$ $H1\ : [] \subseteq K$ $H2\ : K = \{List\ \mathbb{N}\}\ []$ ——— $[] = \{List\ \mathbb{N}\}\ K$
$switch\ in\ H2.$	$K\ : List\ \mathbb{N}$ $H\ : list\_in\_strorder\ []$ $H0\ : list\_in\_strorder\ K$ $H1\ : [] \subseteq K$ $H2\ : [] = \{List\ \mathbb{N}\}\ K$ ——— $[] = \{List\ \mathbb{N}\}\ K$
$use\ H2.$	$+_{1/2}$ completed
$+_{2/2}$	$a\ : \mathbb{N}$ $L\ : List\ \mathbb{N}$ $IHL\ : \forall\ K : List\ \mathbb{N},\ list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ ——— $\forall\ K : List\ \mathbb{N},\ list\_in\_strorder\ (a :: L) \to list\_in\_strorder\ K \to a :: L \subseteq K \to K \subseteq a :: L \to a :: L = \{List\ \mathbb{N}\}\ K$
$rename\ a\ into\ n.$	$n\ : \mathbb{N}$ $L\ : List\ \mathbb{N}$ $IHL\ : \forall\ K : List\ \mathbb{N},\ list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ ——— $\forall\ K : List\ \mathbb{N},\ list\_in\_strorder\ (n :: L) \to list\_in\_strorder\ K \to n :: L \subseteq K \to K \subseteq n :: L \to n :: L = \{List\ \mathbb{N}\}\ K$
$prove\_by\_structure.$	Hidden 2 goal(s)

Continuing proof of Theorem strorder_sublist_antisym on the next page

Table 1: Proof of Theorem strorder_sublist_antisym continued

Next step in Coq	Proof situation
$*_{1/2}$	n : $\mathbb{N}$ L : $List\ \mathbb{N}$ IHL : $\forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ ――――――――――― $list\_in\_strorder\ (n :: L) \to list\_in\_strorder\ [] \to n :: L \subseteq [] \to [] \subseteq n :: L \to n :: L = \{List\ \mathbb{N}\}\ []$
$prove\_all\_imp\_star.$	n : $\mathbb{N}$ L : $List\ \mathbb{N}$ IHL : $\forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ H : $list\_in\_strorder\ (n :: L)$ $H0$: $list\_in\_strorder\ []$ $H1$: $n :: L \subseteq []$ $H2$: $[] \subseteq n :: L$ ――――――――――― $n :: L = \{List\ \mathbb{N}\}\ []$
$prove\_False.$	n : $\mathbb{N}$ L : $List\ \mathbb{N}$ IHL : $\forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ H : $list\_in\_strorder\ (n :: L)$ $H0$: $list\_in\_strorder\ []$ $H1$: $n :: L \subseteq []$ $H2$: $[] \subseteq n :: L$ ――――――――――― $False$
$exception\ H1.$	n : $\mathbb{N}$ L : $List\ \mathbb{N}$ IHL : $\forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ H : $list\_in\_strorder\ (n :: L)$ $H0$: $list\_in\_strorder\ []$ $H2$: $[] \subseteq n :: L$ $H1$: $n :: L = \{List\ \mathbb{N}\}\ []$ ――――――――――― $False$
$my\_contradiction\ H1.$	$*_{1/2}$ completed
$*_{2/2}$	n : $Basic.\mathbb{N}$ L : $List\ Basic.\mathbb{N}$ IHL : $\forall\ K : List\ Basic.\mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ Basic.\mathbb{N}\}\ K$ $\mathbb{N}$: $Basic.\mathbb{N}$ K : $List\ Basic.\mathbb{N}$ ――――――――――― $list\_in\_strorder\ (n :: L) \to list\_in\_strorder\ (\mathbb{N} :: K) \to n :: L \subseteq \mathbb{N} :: K \to \mathbb{N} :: K \subseteq n :: L \to n :: L = \{List\ Basic.\mathbb{N}\}\ \mathbb{N} :: K$

Continuing proof of Theorem strorder_sublist_antisym on the next page

Table 1: Proof of Theorem strorder_sublist_antisym continued

Next step in Coq	Proof situation
rename $\mathbb{N}$ *into m.*	n : $\mathbb{N}$ L : $List\ \mathbb{N}$ IHL : $\forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ m : $\mathbb{N}$ K : $List\ \mathbb{N}$ ――― $list\_in\_strorder\ (n :: L) \to list\_in\_strorder\ (m :: K)\ \to n :: L \subseteq m :: K \to m :: K \subseteq n :: L \to n :: L = \{List\ \mathbb{N}\}\ m :: K$
prove_all_imp_star.	n : $\mathbb{N}$ L : $List\ \mathbb{N}$ IHL : $\forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ m : $\mathbb{N}$ K : $List\ \mathbb{N}$ H : $list\_in\_strorder\ (n :: L)$ $H0$: $list\_in\_strorder\ (m :: K)$ $H1$: $n :: L \subseteq m :: K$ $H2$: $m :: K \subseteq n :: L$ ――― $n :: L = \{List\ \mathbb{N}\}\ m :: K$
fact (list_in_strorder_n_l_to_list_in_strorder_l H).	n : $\mathbb{N}$ L : $List\ \mathbb{N}$ IHL : $\forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ m : $\mathbb{N}$ K : $List\ \mathbb{N}$ H : $list\_in\_strorder\ (n :: L)$ $H0$: $list\_in\_strorder\ (m :: K)$ $H1$: $n :: L \subseteq m :: K$ $H2$: $m :: K \subseteq n :: L$ $H3$: $list\_in\_strorder\ L$ ――― $n :: L = \{List\ \mathbb{N}\}\ m :: K$
fact (list_in_strorder_n_l_to_list_in_strorder_l H0).	n : $\mathbb{N}$ L : $List\ \mathbb{N}$ IHL : $\forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ m : $\mathbb{N}$ K : $List\ \mathbb{N}$ H : $list\_in\_strorder\ (n :: L)$ $H0$: $list\_in\_strorder\ (m :: K)$ $H1$: $n :: L \subseteq m :: K$ $H2$: $m :: K \subseteq n :: L$ $H3$: $list\_in\_strorder\ L$ $H4$: $list\_in\_strorder\ K$ ――― $n :: L = \{List\ \mathbb{N}\}\ m :: K$

Continuing proof of Theorem strorder_sublist_antisym on the next page

Table 1: Proof of Theorem strorder_sublist_antisym continued

Next step in Coq	Proof situation
$fact$ ($strorder\_sublist\_antisym\_help$ H $H0$ $H1$).	$n\ :\mathbb{N}$ $L\ : List\ \mathbb{N}$ $IHL\ : \forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ $m\ :\mathbb{N}$ $K\ : List\ \mathbb{N}$ $H\ : list\_in\_strorder\ (n :: L)$ $H0\ : list\_in\_strorder\ (m :: K)$ $H1\ : n :: L \subseteq m :: K$ $H2\ : m :: K \subseteq n :: L$ $H3\ : list\_in\_strorder\ L$ $H4\ : list\_in\_strorder\ K$ $H5\ : L \subseteq K$ ——— $n :: L = \{List\ \mathbb{N}\}\ m :: K$
$fact$ ($strorder\_sublist\_antisym\_help$ $H0$ H $H2$).	$n\ :\mathbb{N}$ $L\ : List\ \mathbb{N}$ $IHL\ : \forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ $m\ :\mathbb{N}$ $K\ : List\ \mathbb{N}$ $H\ : list\_in\_strorder\ (n :: L)$ $H0\ : list\_in\_strorder\ (m :: K)$ $H1\ : n :: L \subseteq m :: K$ $H2\ : m :: K \subseteq n :: L$ $H3\ : list\_in\_strorder\ L$ $H4\ : list\_in\_strorder\ K$ $H5\ : L \subseteq K$ $H6\ : K \subseteq L$ ——— $n :: L = \{List\ \mathbb{N}\}\ m :: K$
$fact$ (IHL K $H3$ $H4$ $H5$ $H6$).	$n\ :\mathbb{N}$ $L\ : List\ \mathbb{N}$ $IHL\ : \forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ $m\ :\mathbb{N}$ $K\ : List\ \mathbb{N}$ $H\ : list\_in\_strorder\ (n :: L)$ $H0\ : list\_in\_strorder\ (m :: K)$ $H1\ : n :: L \subseteq m :: K$ $H2\ : m :: K \subseteq n :: L$ $H3\ : list\_in\_strorder\ L$ $H4\ : list\_in\_strorder\ K$ $H5\ : L \subseteq K$ $H6\ : K \subseteq L$ $H7\ : L = \{List\ \mathbb{N}\}\ K$ ——— $n :: L = \{List\ \mathbb{N}\}\ m :: K$

Continuing proof of Theorem strorder_sublist_antisym on the next page

Table 1: Proof of Theorem strorder_sublist_antisym continued

Next step in Coq	Proof situation
use_uqe H7.	n : $\mathbb{N}$ L : $List\ \mathbb{N}$ IHL : $\forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ m : $\mathbb{N}$ K : $List\ \mathbb{N}$ H : $list\_in\_strorder\ (n :: L)$ $H0$: $list\_in\_strorder\ (m :: K)$ $H1$: $n :: L \subseteq m :: K$ $H2$: $m :: K \subseteq n :: L$ $H3$: $list\_in\_strorder\ L$ $H4$: $list\_in\_strorder\ K$ $H5$: $L \subseteq K$ $H6$: $K \subseteq L$ $H7$: $L = \{List\ \mathbb{N}\}\ K$ ——— $n :: L = \{List\ \mathbb{N}\}\ m :: L$
have $(n \in n :: L)$.	n : $\mathbb{N}$ L : $List\ \mathbb{N}$ IHL : $\forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ m : $\mathbb{N}$ K : $List\ \mathbb{N}$ H : $list\_in\_strorder\ (n :: L)$ $H0$: $list\_in\_strorder\ (m :: K)$ $H1$: $n :: L \subseteq m :: K$ $H2$: $m :: K \subseteq n :: L$ $H3$: $list\_in\_strorder\ L$ $H4$: $list\_in\_strorder\ K$ $H5$: $L \subseteq K$ $H6$: $K \subseteq L$ $H7$: $L = \{List\ \mathbb{N}\}\ K$ $H8$: $n \in n :: L$ ——— $n :: L = \{List\ \mathbb{N}\}\ m :: L$

Continuing proof of Theorem strorder_sublist_antisym on the next page

Table 1: Proof of Theorem strorder_sublist_antisym continued

Next step in Coq	Proof situation
$trans\ H8\ H1.$	$n\ : \mathbb{N}$ $L\ : List\ \mathbb{N}$ $IHL\ : \forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to$ $L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ $m\ : \mathbb{N}$ $K\ : List\ \mathbb{N}$ $H\ : list\_in\_strorder\ (n :: L)$ $H0\ : list\_in\_strorder\ (m :: K)$ $H1\ : n :: L \subseteq m :: K$ $H2\ : m :: K \subseteq n :: L$ $H3\ : list\_in\_strorder\ L$ $H4\ : list\_in\_strorder\ K$ $H5\ : L \subseteq K$ $H6\ : K \subseteq L$ $H7\ : L = \{List\ \mathbb{N}\}\ K$ $H8\ : n \in n :: L$ $H9\ : n \in m :: K$ ——— $n :: L = \{List\ \mathbb{N}\}\ m :: L$
$use\_or\ \ (a\_in\_b\_l\ H9).$	Hidden 2 goal(s)
$-_{1/2}$	$n\ : \mathbb{N}$ $L\ : List\ \mathbb{N}$ $IHL\ : \forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to$ $L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ $m\ : \mathbb{N}$ $K\ : List\ \mathbb{N}$ $H\ : list\_in\_strorder\ (n :: L)$ $H0\ : list\_in\_strorder\ (m :: K)$ $H1\ : n :: L \subseteq m :: K$ $H2\ : m :: K \subseteq n :: L$ $H3\ : list\_in\_strorder\ L$ $H4\ : list\_in\_strorder\ K$ $H5\ : L \subseteq K$ $H6\ : K \subseteq L$ $H7\ : L = \{List\ \mathbb{N}\}\ K$ $H8\ : n \in n :: L$ $H9\ : n \in m :: K$ $H10\ : n = \{\mathbb{N}\}\ m$ ——— $n :: L = \{List\ \mathbb{N}\}\ m :: L$

Continuing proof of Theorem strorder_sublist_antisym on the next page

Table 1: Proof of Theorem strorder_sublist_antisym continued

Next step in Coq	Proof situation
$use\_uqe\ H10.$	$n\ :\mathbb{N}$ $L\ :List\ \mathbb{N}$ $IHL\ :\forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to$ $L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ $m\ :\mathbb{N}$ $K\ :List\ \mathbb{N}$ $H\ :list\_in\_strorder\ (n :: L)$ $H0\ :list\_in\_strorder\ (m :: K)$ $H1\ :n :: L \subseteq m :: K$ $H2\ :m :: K \subseteq n :: L$ $H3\ :list\_in\_strorder\ L$ $H4\ :list\_in\_strorder\ K$ $H5\ :L \subseteq K$ $H6\ :K \subseteq L$ $H7\ :L = \{List\ \mathbb{N}\}\ K$ $H8\ :n \in n :: L$ $H9\ :n \in m :: K$ $H10\ :n = \{\mathbb{N}\}\ m$ ――――――――――― $n :: L = \{List\ \mathbb{N}\}\ n :: L$
$prove\_equ.$	$-_{1/2}$ completed
$-_{2/2}$	$n\ :\mathbb{N}$ $L\ :List\ \mathbb{N}$ $IHL\ :\forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to$ $L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ $m\ :\mathbb{N}$ $K\ :List\ \mathbb{N}$ $H\ :list\_in\_strorder\ (n :: L)$ $H0\ :list\_in\_strorder\ (m :: K)$ $H1\ :n :: L \subseteq m :: K$ $H2\ :m :: K \subseteq n :: L$ $H3\ :list\_in\_strorder\ L$ $H4\ :list\_in\_strorder\ K$ $H5\ :L \subseteq K$ $H6\ :K \subseteq L$ $H7\ :L = \{List\ \mathbb{N}\}\ K$ $H8\ :n \in n :: L$ $H9\ :n \in m :: K$ $H10\ :n \in K$ ――――――――――― $n :: L = \{List\ \mathbb{N}\}\ m :: L$

Continuing proof of Theorem strorder_sublist_antisym on the next page

Table 1: Proof of Theorem strorder_sublist_antisym continued

Next step in Coq	Proof situation
$prove\_False.$	n : $\mathbb{N}$ L : $List\ \mathbb{N}$ IHL : $\forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ m : $\mathbb{N}$ K : $List\ \mathbb{N}$ H : $list\_in\_strorder\ (n :: L)$ $H0$: $list\_in\_strorder\ (m :: K)$ $H1$: $n :: L \subseteq m :: K$ $H2$: $m :: K \subseteq n :: L$ $H3$: $list\_in\_strorder\ L$ $H4$: $list\_in\_strorder\ K$ $H5$: $L \subseteq K$ $H6$: $K \subseteq L$ $H7$: $L = \{List\ \mathbb{N}\}\ K$ $H8$: $n \in n :: L$ $H9$: $n \in m :: K$ $H10$: $n \in K$ ——— $False$
$use\_uqe\ H7\ in\ H10.$	n : $\mathbb{N}$ L : $List\ \mathbb{N}$ IHL : $\forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ m : $\mathbb{N}$ K : $List\ \mathbb{N}$ H : $list\_in\_strorder\ (n :: L)$ $H0$: $list\_in\_strorder\ (m :: K)$ $H1$: $n :: L \subseteq m :: K$ $H2$: $m :: K \subseteq n :: L$ $H3$: $list\_in\_strorder\ L$ $H4$: $list\_in\_strorder\ K$ $H5$: $L \subseteq K$ $H6$: $K \subseteq L$ $H7$: $L = \{List\ \mathbb{N}\}\ K$ $H8$: $n \in n :: L$ $H9$: $n \in m :: K$ $H10$: $n \in L$ ——— $False$
$assert\ (L \neq [\,]).$	Hidden 2 goal(s)

Continuing proof of Theorem strorder_sublist_antisym on the next page

Table 1: Proof of Theorem strorder_sublist_antisym continued

Next step in Coq	Proof situation
$++_{1/2}$	n : $\mathbb{N}$ L : $List\ \mathbb{N}$ IHL : $\forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ m : $\mathbb{N}$ K : $List\ \mathbb{N}$ H : $list\_in\_strorder\ (n :: L)$ $H0$: $list\_in\_strorder\ (m :: K)$ $H1$: $n :: L \subseteq m :: K$ $H2$: $m :: K \subseteq n :: L$ $H3$: $list\_in\_strorder\ L$ $H4$: $list\_in\_strorder\ K$ $H5$: $L \subseteq K$ $H6$: $K \subseteq L$ $H7$: $L = \{List\ \mathbb{N}\}\ K$ $H8$: $n \in n :: L$ $H9$: $n \in m :: K$ $H10$: $n \in L$ ――――――――――――― $L \neq []$
prove_not.	n : $\mathbb{N}$ L : $List\ \mathbb{N}$ IHL : $\forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ m : $\mathbb{N}$ K : $List\ \mathbb{N}$ H : $list\_in\_strorder\ (n :: L)$ $H0$: $list\_in\_strorder\ (m :: K)$ $H1$: $n :: L \subseteq m :: K$ $H2$: $m :: K \subseteq n :: L$ $H3$: $list\_in\_strorder\ L$ $H4$: $list\_in\_strorder\ K$ $H5$: $L \subseteq K$ $H6$: $K \subseteq L$ $H7$: $L = \{List\ \mathbb{N}\}\ K$ $H8$: $n \in n :: L$ $H9$: $n \in m :: K$ $H10$: $n \in L$ $H11$: $L = \{List\ \mathbb{N}\}\ []$ ――――――――――――― $False$

Continuing proof of Theorem strorder_sublist_antisym on the next page

Table 1: Proof of Theorem strorder_sublist_antisym continued

Next step in Coq	Proof situation
$use\_equ\ H11\ in\ H10.$	$n\ : \mathbb{N}$ $L\ : List\ \mathbb{N}$ $IHL\ : \forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ $m\ : \mathbb{N}$ $K\ : List\ \mathbb{N}$ $H\ : list\_in\_strorder\ (n :: L)$ $H0\ : list\_in\_strorder\ (m :: K)$ $H1\ : n :: L \subseteq m :: K$ $H2\ : m :: K \subseteq n :: L$ $H3\ : list\_in\_strorder\ L$ $H4\ : list\_in\_strorder\ K$ $H5\ : L \subseteq K$ $H6\ : K \subseteq L$ $H7\ : L = \{List\ \mathbb{N}\}\ K$ $H8\ : n \in n :: L$ $H9\ : n \in m :: K$ $H11\ : L = \{List\ \mathbb{N}\}\ []$ $H10\ : n \in []$ ─────────── $False$
$my\_contradiction\ H10.$	$++_{1/2}$ completed
$++_{2/2}$	$n\ : \mathbb{N}$ $L\ : List\ \mathbb{N}$ $IHL\ : \forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ $m\ : \mathbb{N}$ $K\ : List\ \mathbb{N}$ $H\ : list\_in\_strorder\ (n :: L)$ $H0\ : list\_in\_strorder\ (m :: K)$ $H1\ : n :: L \subseteq m :: K$ $H2\ : m :: K \subseteq n :: L$ $H3\ : list\_in\_strorder\ L$ $H4\ : list\_in\_strorder\ K$ $H5\ : L \subseteq K$ $H6\ : K \subseteq L$ $H7\ : L = \{List\ \mathbb{N}\}\ K$ $H8\ : n \in n :: L$ $H9\ : n \in m :: K$ $H10\ : n \in L$ $H11\ : L \neq []$ ─────────── $False$

Continuing proof of Theorem strorder_sublist_antisym on the next page

Table 1: Proof of Theorem strorder_sublist_antisym continued

Next step in Coq	Proof situation
$fact$ $(list\_in\_strorder\_n\_l\_to\_n\_less\_min\_l$ $H11\ H).$	$n\ : \mathbb{N}$ $L\ : List\ \mathbb{N}$ $IHL\ : \forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to$ $L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ $m\ : \mathbb{N}$ $K\ : List\ \mathbb{N}$ $H\ : list\_in\_strorder\ (n :: L)$ $H0\ : list\_in\_strorder\ (m :: K)$ $H1\ : n :: L \subseteq m :: K$ $H2\ : m :: K \subseteq n :: L$ $H3\ : list\_in\_strorder\ L$ $H4\ : list\_in\_strorder\ K$ $H5\ : L \subseteq K$ $H6\ : K \subseteq L$ $H7\ : L = \{List\ \mathbb{N}\}\ K$ $H8\ : n \in n :: L$ $H9\ : n \in m :: K$ $H10\ : n \in L$ $H11\ : L \neq []$ $H12\ : n < min\_list\ L$ ——————————————— $False$
$fact$ $(n\_in\_l\_to\_min\_l\_lequ\_n$ $H10).$	$n\ : \mathbb{N}$ $L\ : List\ \mathbb{N}$ $IHL\ : \forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to$ $L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ $m\ : \mathbb{N}$ $K\ : List\ \mathbb{N}$ $H\ : list\_in\_strorder\ (n :: L)$ $H0\ : list\_in\_strorder\ (m :: K)$ $H1\ : n :: L \subseteq m :: K$ $H2\ : m :: K \subseteq n :: L$ $H3\ : list\_in\_strorder\ L$ $H4\ : list\_in\_strorder\ K$ $H5\ : L \subseteq K$ $H6\ : K \subseteq L$ $H7\ : L = \{List\ \mathbb{N}\}\ K$ $H8\ : n \in n :: L$ $H9\ : n \in m :: K$ $H10\ : n \in L$ $H11\ : L \neq []$ $H12\ : n < min\_list\ L$ $H13\ : min\_list\ L \leq n$ ——————————————— $False$

Continuing proof of Theorem strorder_sublist_antisym on the next page

Table 1: Proof of Theorem strorder_sublist_antisym continued

Next step in Coq	Proof situation
$trans\ H12\ H13.$	$n\ : \mathbb{N}$ $L\ : List\ \mathbb{N}$ $IHL\ : \forall\ K : List\ \mathbb{N},\quad list\_in\_strorder\ L \to list\_in\_strorder\ K \to$ $L \subseteq K \to K \subseteq L \to L = \{List\ \mathbb{N}\}\ K$ $m\ : \mathbb{N}$ $K\ : List\ \mathbb{N}$ $H\ : list\_in\_strorder\ (n :: L)$ $H0\ : list\_in\_strorder\ (m :: K)$ $H1\ : n :: L \subseteq m :: K$ $H2\ : m :: K \subseteq n :: L$ $H3\ : list\_in\_strorder\ L$ $H4\ : list\_in\_strorder\ K$ $H5\ : L \subseteq K$ $H6\ : K \subseteq L$ $H7\ : L = \{List\ \mathbb{N}\}\ K$ $H8\ : n \in n :: L$ $H9\ : n \in m :: K$ $H10\ : n \in L$ $H11\ : L \neq []$ $H12\ : n < min\_list\ L$ $H13\ : min\_list\ L \leq n$ $H14\ : n < n$ ——— $False$
$my\_contradiction$ $H14.$	$++_{2/2}$ completed, proof completed by Qed

End of proof of Theorem strorder_sublist_antisym