

induction

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The *induction* command is applicable to a name in a goal, where the name refers to anything defined in a free type paragraph. It makes the induction constraint implied by the free type paragraph available as an antecedent in the sub-goal.

Given the general form of a free type,

$$\begin{aligned} f_1 &::= h_{1,1} \dots h_{1,m_1} \mid g_{1,1} \langle\langle e_{1,1} \rangle\rangle \dots g_{1,n} \langle\langle e_{1,n} \rangle\rangle \\ &\& \dots \& \\ f_r &::= h_{r,1} \dots h_{r,m_r} \mid g_{r,1} \langle\langle e_{r,1} \rangle\rangle \dots g_{r,n_r} \langle\langle e_{r,n_r} \rangle\rangle \end{aligned}$$

the induction constraint for a free type paragraph is

$$\begin{aligned} &\forall f'_1 : \mathbb{P} f_1; \dots; f'_r : \mathbb{P} f_r \mid \\ &\quad h_{1,1} \in f'_1 \wedge \dots \wedge h_{1,m_1} \in f'_1 \wedge \\ &\quad \dots \wedge \\ &\quad h_{r,1} \in f'_r \wedge \dots \wedge h_{r,m_r} \in f'_r \wedge \\ &\quad (\forall y_{1,1} : \mu f_1 == f'_1; \dots; f_r == f'_r \bullet e_{1,1} \bullet g_{1,1} \ y_{1,1} \in f'_1) \wedge \\ &\quad \dots \wedge \\ &\quad (\forall y_{1,n_1} : \mu f_1 == f'_1; \dots; f_r == f'_r \bullet e_{1,n_1} \bullet g_{1,n_1} \ y_{1,n_1} \in f'_1) \wedge \\ &\quad \dots \wedge \\ &\quad (\forall y_{r,1} : \mu f_1 == f'_1; \dots; f_r == f'_r \bullet e_{r,1} \bullet g_{r,1} \ y_{r,1} \in f'_r) \wedge \\ &\quad \dots \wedge \\ &\quad (\forall y_{r,n_r} : \mu f_1 == f'_1; \dots; f_r == f'_r \bullet e_{r,n_r} \bullet g_{r,n_r} \ y_{r,n_r} \in f'_r) \bullet \\ &\quad f'_1 = f_1 \wedge \dots \wedge f'_r = f_r \end{aligned}$$

1. Tactic example

“induction” e_1 e_2

This example applies the *induction* command to expressions e_1 and e_2 .

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