

separation

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The *separation* command extracts from a quantified formula those immediate sub-formulae that do not refer to the quantified declarations. In each of the following subsections, the earliest applicable simplification in the list is the one that is applied. See also [distribution](#).

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2. Predicates

2.1. Universal quantifications

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$$\begin{aligned}
 \forall s \bullet (p_1 \vee p_2) &\implies p_1 \vee p_2 \vee (\forall s \bullet \text{false}) \text{ where } p_1 \text{ and } p_2 \text{ do not refer to } s \\
 \forall s \bullet (p_1 \vee p_2) &\implies p_1 \vee (\forall s \bullet p_2) \text{ where } p_1 \text{ does not refer to } s \\
 \forall s \bullet (p_1 \vee p_2) &\implies (\forall s \bullet p_1) \vee p_2 \text{ where } p_2 \text{ does not refer to } s \\
 \forall s \bullet (p_1 \Rightarrow p_2) &\implies (p_1 \Rightarrow p_2) \vee (\forall s \bullet \text{false}) \text{ where } p_1 \text{ and } p_2 \text{ do not refer to } s \\
 \forall s \bullet (p_1 \Rightarrow p_2) &\implies p_1 \Rightarrow (\forall s \bullet p_2) \text{ where } p_1 \text{ does not refer to } s \\
 \forall s \bullet (p_1 \Rightarrow p_2) &\implies (\exists s \bullet p_1) \Rightarrow p_2 \text{ where } p_2 \text{ does not refer to } s
 \end{aligned}$$

2.2. Existential quantifications

$$\begin{aligned}
 \exists s \bullet (p_1 \wedge p_2) &\implies p_1 \wedge p_2 \wedge (\exists s \bullet \text{true}) \text{ where } p_1 \text{ and } p_2 \text{ do not refer to } s \\
 \exists s \bullet (p_1 \wedge p_2) &\implies p_1 \wedge (\exists s \bullet p_2) \text{ where } p_1 \text{ does not refer to } s \\
 \exists s \bullet (p_1 \wedge p_2) &\implies (\exists s \bullet p_1) \wedge p_2 \text{ where } p_2 \text{ does not refer to } s
 \end{aligned}$$

2.3. Unique existential quantifications

$$\begin{aligned}
 \exists_1 s \bullet (p_1 \wedge p_2) &\implies p_1 \wedge p_2 \wedge (\exists_1 s \bullet \text{true}) \text{ where } p_1 \text{ and } p_2 \text{ do not refer to } s \\
 \exists_1 s \bullet (p_1 \wedge p_2) &\implies p_1 \wedge (\exists_1 s \bullet p_2) \text{ where } p_1 \text{ does not refer to } s \\
 \exists_1 s \bullet (p_1 \wedge p_2) &\implies (\exists_1 s \bullet p_1) \wedge p_2 \text{ where } p_2 \text{ does not refer to } s
 \end{aligned}$$

3. Tactic example

“separation” $p \ q$

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This example applies the *separation* command to predicates p and q .

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