

Example for Propagation Lemma

Program SUM:

1. $sum(x, 0, x) \leftarrow,$
2. $sum(x, s(y), s(z)) \leftarrow sum(x, y, z),$

An SLD-resultant step $R \Rightarrow R_1$:

$R := sum(s(s(0)), s(s(0)), z) \leftarrow sum(s(s(0)), s(s(0)), z)$ level 0

$R_1 := (sum(s(s(0)), s(s(0)), z) \leftarrow sum(x_1, y_1, z_1))\theta$ level 1

$\theta := \{x_1 \mapsto s(s(0)), y_1 \mapsto s(0), z \mapsto s(z_1)\}$

An SLD-resultant step $R' \Rightarrow R'_1$:

$R' := sum(x', y', z') \leftarrow sum(x', y', z')$ level 0

$R'_1 := (sum(x', y', z') \leftarrow sum(x'_1, y'_1, z'_1))\theta'$ level 1

$\theta' := \{x' \mapsto x'_1, y' \mapsto s(y'_1), z' \mapsto s(z'_1)\}$