

t18\_osalg\_1  
(TMbijA4sjU7GdXBDKZa8V99iZgPCxAEOxNE)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v11\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v4\_osalg\_1 : \iota \Rightarrow o$  be given. Let  $v5\_osalg\_1 : \iota \Rightarrow o$  be given. Let  $l3\_osalg\_1 : \iota \Rightarrow o$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $m2\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k3\_relat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u1\_msualg\_1 : \iota \Rightarrow \iota$  be given. Let  $k6\_finseq\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k3\_osalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u2\_msualg\_1 : \iota \Rightarrow \iota$  be given. Let  $v12\_osalg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k4\_osalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $u3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v4\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v11\_osalg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r8\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v3\_orders\_2 : \iota \Rightarrow o$  be given. Let  $v4\_orders\_2 : \iota \Rightarrow o$  be given. Let  $v5\_orders\_2 : \iota \Rightarrow o$  be given. Let  $l1\_orders\_2 : \iota \Rightarrow o$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l2\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l1\_osalg\_1 : \iota \Rightarrow o$  be given. Let  $l2\_osalg\_1 : \iota \Rightarrow o$  be given. Let  $l1\_msualg\_1 : \iota \Rightarrow o$  be given. Let  $v3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v4\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u4\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v4\_osalg\_1 \\ & X0) \wedge ((v5\_osalg\_1 X0) \wedge (l3\_osalg\_1 X0)))))) \Rightarrow (\forall X1.(l3\_msualg\_1 \\ & X1 X0) \Rightarrow ((v12\_osalg\_1 X1 X0) \Leftrightarrow ((v1\_relat\_1 (u3\_msualg\_1 X0 X1)) \wedge \\ & ((v4\_relat\_1 (u3\_msualg\_1 X0 X1) (u1\_struct\_0 X0)) \wedge ((v1\_funct\_1 \\ & (u3\_msualg\_1 X0 X1)) \wedge ((v1\_partfun1 (u3\_msualg\_1 X0 X1) (u1\_struct\_0 \\ & X0)) \wedge (v11\_osalg\_1 (u3\_msualg\_1 X0 X1) X0))))))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. ((\neg v1\_xboole\_0 X0) \wedge (((v1\_relat\_1 \\ & X1) \wedge ((v4\_relat\_1 X1 X0) \wedge ((v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 X0)))))) \wedge \\ & (((v1\_relat\_1 X2) \wedge ((v4\_relat\_1 X2 X0) \wedge ((v1\_funct\_1 X2) \wedge (v1\_partfun1 \\ & X2 X0)))))) \Rightarrow ((r8\_pboole X0 X1 X2) \Leftrightarrow (X1 = X2)) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.(((\neg v2\_struct\_0 X0)\wedge((v3\_orders\_2 X0)\wedge \\ ((v4\_orders\_2 X0)\wedge((v5\_orders\_2 X0)\wedge(l1\_orders\_2 X0))))))\wedge \\ (\neg v1\_xboole\_0 X1))\Rightarrow((v1\_relat\_1 (k3\_osalg\_1 X0 X1))\wedge((v4\_relat\_1 \\ (k3\_osalg\_1 X0 X1) (u1\_struct\_0 X0))\wedge((v1\_funct\_1 (k3\_osalg\_1 \\ X0 X1))\wedge((v1\_partfun1 (k3\_osalg\_1 X0 X1) (u1\_struct\_0 X0))\wedge(v11\_osalg\_1 \\ (k3\_osalg\_1 X0 X1) X0)))))) \end{aligned} \quad (3)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0)\wedge(l1\_struct\_0 X0))\Rightarrow(\neg v1\_xboole\_0 \\ (u1\_struct\_0 X0)) \quad (4)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((l1\_struct\_0 X0)\wedge(l2\_msualg\_1 X1 X0))\Rightarrow \\ ((v1\_relat\_1 (u3\_msualg\_1 X0 X1))\wedge((v4\_relat\_1 (u3\_msualg\_1 \\ X0 X1) (u1\_struct\_0 X0))\wedge((v1\_funct\_1 (u3\_msualg\_1 X0 X1))\wedge(v1\_partfun1 \\ (u3\_msualg\_1 X0 X1) (u1\_struct\_0 X0)))))) \end{aligned} \quad (5)$$

Assume the following.

$$\forall X0.(l3\_osalg\_1 X0)\Rightarrow((l1\_osalg\_1 X0)\wedge(l2\_osalg\_1 X0)) \quad (6)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0)\wedge(l1\_msualg\_1 X0))\Rightarrow(\forall X1. \\ (l3\_msualg\_1 X1 X0)\Rightarrow(l2\_msualg\_1 X1 X0)) \quad (7)$$

Assume the following.

$$\forall X0.(l2\_osalg\_1 X0)\Rightarrow((l1\_msualg\_1 X0)\wedge(l1\_orders\_2 X0)) \quad (8)$$

Assume the following.

$$\forall X0.(l1\_orders\_2 X0)\Rightarrow(l1\_struct\_0 X0) \quad (9)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0)\wedge((\neg v11\_struct\_0 \\ X0)\wedge((v4\_osalg\_1 X0)\wedge((v5\_osalg\_1 X0)\wedge(l3\_osalg\_1 X0))))))\wedge \\ ((\neg v1\_xboole\_0 X1)\wedge(m2\_pboole X2 (u4\_struct\_0 X0) (k3\_relat\_1 \\ (u1\_msualg\_1 X0) (k6\_finseq\_2 (u1\_struct\_0 X0) (k3\_osalg\_1 X0 \\ X1))) (k3\_relat\_1 (u2\_msualg\_1 X0) (k3\_osalg\_1 X0 X1))))))\Rightarrow((v3\_msualg\_1 \\ (k4\_osalg\_1 X0 X1 X2) X0)\wedge((v4\_msualg\_1 (k4\_osalg\_1 X0 X1 X2) X0)\wedge \\ (l3\_msualg\_1 (k4\_osalg\_1 X0 X1 X2) X0))) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge ((v3\_orders\_2 X0) \wedge \\ & ((v4\_orders\_2 X0) \wedge ((v5\_orders\_2 X0) \wedge (l1\_orders\_2 X0)))))) \wedge (\neg v1\_xboole\_0 X1)) \Rightarrow ((v1\_relat\_1 (k3\_osalg\_1 X0 X1)) \wedge ((v4\_relat\_1 \\ & (k3\_osalg\_1 X0 X1) (u1\_struct\_0 X0)) \wedge ((v1\_funct\_1 (k3\_osalg\_1 \\ & X0 X1)) \wedge (v1\_partfun1 (k3\_osalg\_1 X0 X1) (u1\_struct\_0 X0)))))) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v4\_osalg\_1 \\ & X0) \wedge ((v5\_osalg\_1 X0) \wedge (l3\_osalg\_1 X0)))))) \Rightarrow (\forall X1. (\neg v1\_xboole\_0 \\ & X1) \Rightarrow (\forall X2. (m2\_pboole X2 (u4\_struct\_0 X0) (k3\_relat\_1 (u1\_msualg\_1 \\ & X0) (k6\_finseq\_2 (u1\_struct\_0 X0) (k3\_osalg\_1 X0 X1))) (k3\_relat\_1 \\ & (u2\_msualg\_1 X0) (k3\_osalg\_1 X0 X1)))) \Rightarrow (\forall X3. ((v3\_msualg\_1 \\ & X3 X0) \wedge ((v4\_msualg\_1 X3 X0) \wedge (l3\_msualg\_1 X3 X0))) \Rightarrow ((X3 = k4\_osalg\_1 \\ & X0 X1 X2) \Leftrightarrow ((r8\_pboole (u1\_struct\_0 X0) (u3\_msualg\_1 X0 X3) (k3\_osalg\_1 \\ & X0 X1)) \wedge (r8\_pboole (u4\_struct\_0 X0) (u4\_msualg\_1 X0 X3) X2)))))) \end{aligned} \quad (12)$$

Assume the following.

$$\forall X0. (l3\_osalg\_1 X0) \Rightarrow ((v4\_osalg\_1 X0) \Rightarrow ((v3\_orders\_2 X0) \wedge ((v4\_orders\_2 X0) \wedge (v5\_orders\_2 X0)))) \quad (13)$$

**Theorem 1**

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v4\_osalg\_1 \\ & X0) \wedge ((v5\_osalg\_1 X0) \wedge (l3\_osalg\_1 X0)))))) \Rightarrow (\forall X1. (\neg v1\_xboole\_0 \\ & X1) \Rightarrow (\forall X2. (m2\_pboole X2 (u4\_struct\_0 X0) (k3\_relat\_1 (u1\_msualg\_1 \\ & X0) (k6\_finseq\_2 (u1\_struct\_0 X0) (k3\_osalg\_1 X0 X1))) (k3\_relat\_1 \\ & (u2\_msualg\_1 X0) (k3\_osalg\_1 X0 X1)))) \Rightarrow (v12\_osalg\_1 (k4\_osalg\_1 \\ & X0 X1 X2) X0)) \end{aligned}$$