

t35\_osalg\_1 (TM-  
FCrx2iAooSC2T3A1VcKEJZmsdPGMsW3Y7)

October 27, 2020

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  $v8\_osalg\_1 : \iota \Rightarrow o$  be given. Let  $v10\_osalg\_1 : \iota \Rightarrow o$  be given. Let  $l3\_osalg\_1 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $m2\_finseq\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k3\_finseq\_2 : \iota \Rightarrow \iota$  be given. Let  $r2\_osalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r6\_osalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_osalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r1\_osalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k8\_osalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r5\_osalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r3\_osalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v7\_osalg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r3\_orders\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r4\_osalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v4\_osalg\_1 \\ & X0) \wedge ((v5\_osalg\_1 X0) \wedge ((v8\_osalg\_1 X0) \wedge ((v10\_osalg\_1 X0) \wedge (l3\_osalg\_1 \\ & X0)))))) \Rightarrow (\forall X1. (m1\_subset\_1 X1 (u4\_struct\_0 X0)) \Rightarrow (\forall X2. \\ & (m1\_subset\_1 X2 (u4\_struct\_0 X0)) \Rightarrow (\forall X3. (m2\_finseq\_2 X3 \\ & (u1\_struct\_0 X0) (k3\_finseq\_2 (u1\_struct\_0 X0)))) \Rightarrow (((r1\_osalg\_1 \\ & X0 X1 X2) \wedge ((r2\_osalg\_1 X0 X3 (k1\_msualg\_1 X0 X1)) \wedge (r2\_osalg\_1 X0 \\ & X3 (k1\_msualg\_1 X0 X2)))) \Rightarrow (k2\_osalg\_1 X0 X1 X3 = k2\_osalg\_1 X0 X2 \\ & X3)))))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v4\_osalg\_1 \\ & X0) \wedge ((v5\_osalg\_1 X0) \wedge (l3\_osalg\_1 X0)))) \Rightarrow (\forall X1. (m1\_subset\_1 \\ & X1 (u4\_struct\_0 X0)) \Rightarrow (\forall X2. (m1\_subset\_1 X2 (u4\_struct\_0 \\ & X0)) \Rightarrow ((r1\_osalg\_1 X0 X1 X2) \Leftrightarrow (k8\_osalg\_1 X0 X1 = k8\_osalg\_1 X0 X2)))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v4\_osalg\_1 \\
& X0) \wedge ((v5\_osalg\_1 X0) \wedge ((v8\_osalg\_1 X0) \wedge (l3\_osalg\_1 X0)))))) \Rightarrow \\
& ((v10\_osalg\_1 X0) \Leftrightarrow (\forall X1.(m1\_subset\_1 X1 (u4\_struct\_0 X0)) \Rightarrow \\
& (\forall X2.(m2\_finseq\_2 X2 (u1\_struct\_0 X0) (k3\_finseq\_2 (u1\_struct\_0 \\
& X0))) \Rightarrow (\neg(r2\_osalg\_1 X0 X2 (k1\_msualg\_1 X0 X1)) \wedge (\forall X3.(m1\_subset\_1 \\
& X3 (u4\_struct\_0 X0)) \Rightarrow (\neg r5\_osalg\_1 X0 X1 X3 X2))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v4\_osalg\_1 \\
& X0) \wedge ((v5\_osalg\_1 X0) \wedge (l3\_osalg\_1 X0)))))) \Rightarrow (\forall X1.(m1\_subset\_1 \\
& X1 (u4\_struct\_0 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u4\_struct\_0 \\
& X0)) \Rightarrow (\forall X3.(m2\_finseq\_2 X3 (u1\_struct\_0 X0) (k3\_finseq\_2 \\
& (u1\_struct\_0 X0))) \Rightarrow ((r3\_osalg\_1 X0 X1 X2 X3) \Leftrightarrow ((r1\_osalg\_1 X0 X1 \\
& X2) \wedge ((r2\_osalg\_1 X0 X3 (k1\_msualg\_1 X0 X2)) \wedge (\forall X4.(m1\_subset\_1 \\
& X4 (u4\_struct\_0 X0)) \Rightarrow (((r1\_osalg\_1 X0 X1 X4) \wedge (r2\_osalg\_1 X0 X3 \\
& (k1\_msualg\_1 X0 X4)))) \Rightarrow (r2\_osalg\_1 X0 (k1\_msualg\_1 X0 X2) (k1\_msualg\_1 \\
& X0 X4)))))))))
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v4\_osalg\_1 \\
& X0) \wedge ((v5\_osalg\_1 X0) \wedge (l3\_osalg\_1 X0)))))) \Rightarrow ((v8\_osalg\_1 X0) \Leftrightarrow \\
& (\forall X1.(m1\_subset\_1 X1 (u4\_struct\_0 X0)) \Rightarrow (v7\_osalg\_1 X1 \\
& X0)))
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v4\_osalg\_1 \\
& X0) \wedge ((v5\_osalg\_1 X0) \wedge (l3\_osalg\_1 X0)))))) \Rightarrow (\forall X1.(m1\_subset\_1 \\
& X1 (u4\_struct\_0 X0)) \Rightarrow ((v7\_osalg\_1 X1 X0) \Leftrightarrow (\forall X2.(m1\_subset\_1 \\
& X2 (u4\_struct\_0 X0)) \Rightarrow (((r1\_osalg\_1 X0 X1 X2) \wedge (r2\_osalg\_1 X0 (k1\_msualg\_1 \\
& X0 X1) (k1\_msualg\_1 X0 X2))) \Rightarrow (r3\_orders\_2 X0 (k2\_msualg\_1 X0 X1) \\
& (k2\_msualg\_1 X0 X2))))))
\end{aligned} \tag{6}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v4\_osalg\_1 \\
& X0) \wedge ((v5\_osalg\_1 X0) \wedge (l3\_osalg\_1 X0)))))) \Rightarrow (\forall X1.(m1\_subset\_1 \\
& X1 (u4\_struct\_0 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u4\_struct\_0 \\
& X0)) \Rightarrow ((r6\_osalg\_1 X0 X1 X2) \Leftrightarrow ((r1\_osalg\_1 X0 X1 X2) \wedge ((r2\_osalg\_1 \\
& X0 (k1\_msualg\_1 X0 X1) (k1\_msualg\_1 X0 X2)) \wedge (r3\_orders\_2 X0 (k2\_msualg\_1 \\
& X0 X1) (k2\_msualg\_1 X0 X2))))))
\end{aligned} \tag{7}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v4\_osalg\_1 \\
& X0) \wedge ((v5\_osalg\_1 X0) \wedge ((v8\_osalg\_1 X0) \wedge ((v10\_osalg\_1 X0) \wedge (l3\_osalg\_1 \\
& X0)))))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u4\_struct\_0 X0)) \Rightarrow (\forall X2. \\
& (m2\_finseq\_2 X2 (u1\_struct\_0 X0) (k3\_finseq\_2 (u1\_struct\_0 X0))) \Rightarrow \\
& ((r2\_osalg\_1 X0 X2 (k1\_msualg\_1 X0 X1)) \Rightarrow (\forall X3.(m1\_subset\_1 \\
& X3 (u4\_struct\_0 X0)) \Rightarrow ((X3 = k2\_osalg\_1 X0 X1 X2) \Leftrightarrow (r3\_osalg\_1 X0 \\
& X1 X3 X2))))))
\end{aligned} \tag{8}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v4\_osalg\_1 \\
& X0) \wedge ((v5\_osalg\_1 X0) \wedge (l3\_osalg\_1 X0)))) \Rightarrow (\forall X1.(m1\_subset\_1 \\
& X1 (u4\_struct\_0 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u4\_struct\_0 \\
& X0)) \Rightarrow (\forall X3.(m2\_finseq\_2 X3 (u1\_struct\_0 X0) (k3\_finseq\_2 \\
& (u1\_struct\_0 X0))) \Rightarrow ((r5\_osalg\_1 X0 X1 X2 X3) \Leftrightarrow ((r3\_osalg\_1 X0 X1 \\
& X2 X3) \wedge (r4\_osalg\_1 X0 X1 X2 X3))))))
\end{aligned} \tag{9}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v4\_osalg\_1 \\
& X0) \wedge ((v5\_osalg\_1 X0) \wedge (l3\_osalg\_1 X0)))) \Rightarrow (\forall X1.(m1\_subset\_1 \\
& X1 (u4\_struct\_0 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u4\_struct\_0 \\
& X0)) \Rightarrow (\forall X3.(m2\_finseq\_2 X3 (u1\_struct\_0 X0) (k3\_finseq\_2 \\
& (u1\_struct\_0 X0))) \Rightarrow ((r4\_osalg\_1 X0 X1 X2 X3) \Leftrightarrow ((r1\_osalg\_1 X0 X1 \\
& X2) \wedge ((r2\_osalg\_1 X0 X3 (k1\_msualg\_1 X0 X2)) \wedge (\forall X4.(m1\_subset\_1 \\
& X4 (u4\_struct\_0 X0)) \Rightarrow (((r1\_osalg\_1 X0 X1 X4) \wedge (r2\_osalg\_1 X0 X3 \\
& (k1\_msualg\_1 X0 X4)) \Rightarrow (r3\_orders\_2 X0 (k2\_msualg\_1 X0 X2) (k2\_msualg\_1 \\
& X0 X4))))))))))
\end{aligned} \tag{10}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v4\_osalg\_1 \\
& X0) \wedge ((v5\_osalg\_1 X0) \wedge ((v8\_osalg\_1 X0) \wedge ((v10\_osalg\_1 X0) \wedge (l3\_osalg\_1 \\
& X0)))))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u4\_struct\_0 X0)) \Rightarrow (\forall X2. \\
& (m2\_finseq\_2 X2 (u1\_struct\_0 X0) (k3\_finseq\_2 (u1\_struct\_0 X0))) \Rightarrow \\
& ((r2\_osalg\_1 X0 X2 (k1\_msualg\_1 X0 X1)) \Rightarrow (r6\_osalg\_1 X0 (k2\_osalg\_1 \\
& X0 X1 X2) X1))))
\end{aligned}$$