

t28\_bcialg\_1  
(TMLowmTcCBdLiU8dde1bqxKZcJf2dQrEfGj)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v3\_bcialg\_1 : \iota \Rightarrow o$  be given. Let  $v4\_bcialg\_1 : \iota \Rightarrow o$  be given. Let  $v5\_bcialg\_1 : \iota \Rightarrow o$  be given. Let  $v7\_bcialg\_1 : \iota \Rightarrow o$  be given. Let  $l2\_bcialg\_1 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k5\_bcialg\_1 : \iota \Rightarrow \iota$  be given. Let  $k1\_bcialg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_bcialg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $l1\_bcialg\_1 : \iota \Rightarrow o$  be given. Let  $l2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v10\_bcialg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v3\_bcialg\_1 X0) \wedge ((v4\_bcialg\_1 \\ & X0) \wedge ((v5\_bcialg\_1 X0) \wedge ((v7\_bcialg\_1 X0) \wedge (l2\_bcialg\_1 X0)))))) \Rightarrow \\ & (\forall X1. (m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. (m1\_subset\_1 \\ & X2 (u1\_struct\_0 X0)) \Rightarrow (k2\_bcialg\_1 X0 (k1\_bcialg\_1 X0 X1 X2) = k1\_bcialg\_1 \\ & X0 (k2\_bcialg\_1 X0 X1) (k2\_bcialg\_1 X0 X2)))) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v3\_bcialg\_1 X0) \wedge ((v4\_bcialg\_1 \\ & X0) \wedge ((v5\_bcialg\_1 X0) \wedge ((v7\_bcialg\_1 X0) \wedge (l2\_bcialg\_1 X0)))))) \Rightarrow \\ & (\forall X1. (m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. (m1\_subset\_1 \\ & X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3. (m1\_subset\_1 X3 (u1\_struct\_0 \\ & X0)) \Rightarrow (k1\_bcialg\_1 X0 (k1\_bcialg\_1 X0 X1 X2) X3 = k1\_bcialg\_1 X0 ( \\ & k1\_bcialg\_1 X0 X1 X3) X2)))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge (l2\_bcialg\_1 X0)) \Rightarrow (((\neg v2\_struct\_0 \\ & X0) \wedge ((v3\_bcialg\_1 X0) \wedge ((v4\_bcialg\_1 X0) \wedge ((v5\_bcialg\_1 X0) \wedge \\ & ((v7\_bcialg\_1 X0) \wedge (l2\_bcialg\_1 X0)))))) \Leftrightarrow ((v5\_bcialg\_1 X0) \wedge \\ & ((v7\_bcialg\_1 X0) \wedge (\forall X1. (m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow \\ & (\forall X2. (m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3. (m1\_subset\_1 \\ & X3 (u1\_struct\_0 X0)) \Rightarrow ((k1\_bcialg\_1 X0 (k1\_bcialg\_1 X0 (k1\_bcialg\_1 \\ & X0 X1 X2) (k1\_bcialg\_1 X0 X1 X3)) (k1\_bcialg\_1 X0 X3 X2) = k4\_struct\_0 \\ & X0) \wedge (k1\_bcialg\_1 X0 (k1\_bcialg\_1 X0 X1 (k1\_bcialg\_1 X0 X1 X2)) X2 = \\ & k4\_struct\_0 X0)))))))) \end{aligned} \quad (3)$$

Assume the following.

$$\forall X0.\exists X1.m1\_subset\_1 X1 X0 \quad (4)$$

Assume the following.

$$\forall X0.(l2\_bcialg\_1 X0)\Rightarrow((l1\_bcialg\_1 X0)\wedge(l2\_struct\_0 X0)) \quad (5)$$

Assume the following.

$$\begin{aligned} &\forall X0.\forall X1.\forall X2.((l1\_bcialg\_1 X0)\wedge((m1\_subset\_1 \\ &X1 (u1\_struct\_0 X0))\wedge(m1\_subset\_1 X2 (u1\_struct\_0 X0))))\Rightarrow(m1\_subset\_1 \\ &(k1\_bcialg\_1 X0 X1 X2) (u1\_struct\_0 X0)) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} &\forall X0.((\neg v2\_struct\_0 X0)\wedge(l2\_bcialg\_1 X0))\Rightarrow((v7\_bcialg\_1 \\ &X0)\Leftrightarrow(\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0))\Rightarrow(\forall X2. \\ &(m1\_subset\_1 X2 (u1\_struct\_0 X0))\Rightarrow(((k1\_bcialg\_1 X0 X1 X2 = k4\_struct\_0 \\ &X0)\wedge(k1\_bcialg\_1 X0 X2 X1 = k4\_struct\_0 X0))\Rightarrow(X1 = X2)))))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} &\forall X0.((\neg v2\_struct\_0 X0)\wedge(l2\_bcialg\_1 X0))\Rightarrow((v5\_bcialg\_1 \\ &X0)\Leftrightarrow(\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0))\Rightarrow(k1\_bcialg\_1 \\ &X0 X1 X1 = k4\_struct\_0 X0))) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} &\forall X0.((\neg v2\_struct\_0 X0)\wedge(l2\_bcialg\_1 X0))\Rightarrow(\forall X1. \\ &(m1\_subset\_1 X1 (u1\_struct\_0 X0))\Rightarrow(k2\_bcialg\_1 X0 X1 = k1\_bcialg\_1 \\ &X0 (k4\_struct\_0 X0) X1)) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} &\forall X0.((\neg v2\_struct\_0 X0)\wedge((v3\_bcialg\_1 X0)\wedge((v4\_bcialg\_1 \\ &X0)\wedge((v5\_bcialg\_1 X0)\wedge((v7\_bcialg\_1 X0)\wedge(l2\_bcialg\_1 X0))))))\Rightarrow \\ &(k5\_bcialg\_1 X0 = ReplSep (toset (\lambda X1 : \iota.m1\_subset\_1 X1 (u1\_struct\_0 \\ &X0))) (\lambda X1 : \iota.v10\_bcialg\_1 X1 X0) (\lambda X1 : \iota.X1))) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} &\forall X0.((\neg v2\_struct\_0 X0)\wedge((v3\_bcialg\_1 X0)\wedge((v4\_bcialg\_1 \\ &X0)\wedge((v5\_bcialg\_1 X0)\wedge((v7\_bcialg\_1 X0)\wedge(l2\_bcialg\_1 X0))))))\Rightarrow \\ &(\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0))\Rightarrow((v10\_bcialg\_1 \\ &X1 X0)\Leftrightarrow(\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0))\Rightarrow((k1\_bcialg\_1 \\ &X0 X2 X1 = k4\_struct\_0 X0)\Rightarrow(X2 = X1)))))) \end{aligned} \quad (11)$$

**Theorem 1**

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v3\_bialg\_1 X0) \wedge ((v4\_bialg\_1 \\ & X0) \wedge ((v5\_bialg\_1 X0) \wedge ((v7\_bialg\_1 X0) \wedge (l2\_bialg\_1 X0)))))) \Rightarrow \\ & (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow ((X1 \in k5\_bialg\_1 \\ & X0) \Leftrightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (k1\_bialg\_1 \\ & X0 (k2\_bialg\_1 X0 X2) (k2\_bialg\_1 X0 X1) = k1\_bialg\_1 X0 X1 X2)))) \end{aligned}$$