

t69\_bcialg\_1 (TM-  
JAndJf1no9jphABWQwC1aNNWPmMSFCUEr)

October 27, 2020

Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l2\_bcialg\_1 : \iota \Rightarrow o$  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  $v19\_bcialg\_1 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k1\_bcialg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k2\_bcialg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l1\_bcialg\_1 : \iota \Rightarrow o$  be given. Let  $l2\_struct\_0 : \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v3\_bcialg\_1 X0) \wedge ((v4\_bcialg\_1 \\
 & X0) \wedge ((v5\_bcialg\_1 X0) \wedge ((v7\_bcialg\_1 X0) \wedge (l2\_bcialg\_1 X0)))))) \Rightarrow \\
 & ((v19\_bcialg\_1 X0) \Leftrightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 \\
 & X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3. \\
 & (m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow (k1\_bcialg\_1 X0 (k1\_bcialg\_1 \\
 & X0 X3 X2) (k1\_bcialg\_1 X0 X3 X1) = k1\_bcialg\_1 X0 X1 X2))))))
 \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v3\_bcialg\_1 X0) \wedge ((v4\_bcialg\_1 \\
 & X0) \wedge ((v5\_bcialg\_1 X0) \wedge ((v7\_bcialg\_1 X0) \wedge (l2\_bcialg\_1 X0)))))) \Rightarrow \\
 & ((v19\_bcialg\_1 X0) \Leftrightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 \\
 & X0)) \Rightarrow (k2\_bcialg\_1 X0 (k2\_bcialg\_1 X0 X1) = X1)))
 \end{aligned} \tag{2}$$

Assume the following.

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

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge (l2\_bcialg\_1 X0)) \Rightarrow & (((\neg v2\_struct\_0 X0) \wedge ((v3\_bcialg\_1 X0) \wedge ((v4\_bcialg\_1 X0) \wedge ((v5\_bcialg\_1 X0) \wedge \\ & ((v7\_bcialg\_1 X0) \wedge (l2\_bcialg\_1 X0)))))) \Leftrightarrow ((v7\_bcialg\_1 X0) \wedge \\ & (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 \\ & X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 \\ & X0)) \Rightarrow ((k1\_bcialg\_1 X0 (k1\_bcialg\_1 X0 (k1\_bcialg\_1 X0 X1 X2) (k1\_bcialg\_1 \\ & X0 X1 X3)) (k1\_bcialg\_1 X0 X3 X2) = k4\_struct\_0 X0) \wedge (k1\_bcialg\_1 \\ & X0 X1 (k4\_struct\_0 X0) = X1)))))) \end{aligned} \quad (4)$$

Assume the following.

$$\forall X0. \exists X1. m1\_subset\_1 X1 X0 \quad (5)$$

Assume the following.

$$\forall X0. (l2\_bcialg\_1 X0) \Rightarrow ((l1\_bcialg\_1 X0) \wedge (l2\_struct\_0 X0)) \quad (6)$$

Assume the following.

$$\forall X0. (l2\_struct\_0 X0) \Rightarrow (m1\_subset\_1 (k4\_struct\_0 X0) (u1\_struct\_0 X0)) \quad (7)$$

Assume the following.

$$\begin{aligned} \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge (l2\_bcialg\_1 X0)) \wedge \\ (m1\_subset\_1 X1 (u1\_struct\_0 X0))) \Rightarrow (m1\_subset\_1 (k2\_bcialg\_1 \\ X0 X1) (u1\_struct\_0 X0)) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} \forall X0. \forall X1. \forall X2. ((l1\_bcialg\_1 X0) \wedge ((m1\_subset\_1 \\ X1 (u1\_struct\_0 X0)) \wedge (m1\_subset\_1 X2 (u1\_struct\_0 X0)))) \Rightarrow (m1\_subset\_1 \\ (k1\_bcialg\_1 X0 X1 X2) (u1\_struct\_0 X0)) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} \forall X0. ((\neg v2\_struct\_0 X0) \wedge (l2\_bcialg\_1 X0)) \Rightarrow ((v7\_bcialg\_1 \\ X0) \Leftrightarrow (\forall X1. (m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. \\ (m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (((k1\_bcialg\_1 X0 X1 X2 = k4\_struct\_0 \\ X0) \wedge (k1\_bcialg\_1 X0 X2 X1 = k4\_struct\_0 X0)) \Rightarrow (X1 = X2)))))) \end{aligned} \quad (10)$$

Assume the following.

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

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge (l2\_bialg\_1 X0)) \Rightarrow (\forall X1. \\ & (m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (k2\_bialg\_1 X0 X1 = k1\_bialg\_1 \\ & X0 (k4\_struct\_0 X0) X1)) \end{aligned} \tag{12}$$

**Theorem 1**

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge (l2\_bialg\_1 X0)) \Rightarrow (((\neg v2\_struct\_0 \\ & X0) \wedge ((v3\_bialg\_1 X0) \wedge ((v4\_bialg\_1 X0) \wedge ((v5\_bialg\_1 X0) \wedge \\ & ((v7\_bialg\_1 X0) \wedge ((v19\_bialg\_1 X0) \wedge (l2\_bialg\_1 X0))))))) \Leftrightarrow \\ & (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 \\ & X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 \\ & X0)) \Rightarrow ((k1\_bialg\_1 X0 (k1\_bialg\_1 X0 X1 X2) (k1\_bialg\_1 X0 X1 \\ & X3) = k1\_bialg\_1 X0 X3 X2) \wedge (k1\_bialg\_1 X0 X1 (k4\_struct\_0 X0) = \\ & X1)))))) \end{aligned}$$