

t60\_scmfsa8c (TMUsxMfKiXAJxHGR-  
WkvKXes6L5vJEmKwNXc)

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Let  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v4\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k5\_numbers : \iota$  be given. Let  $v5\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_compos\_1 : \iota \Rightarrow \iota$  be given. Let  $k1\_scmfsa\_2 : \iota$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $v5\_funct\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_memstr\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $np\_3 : \iota$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $v1\_finset\_1 : \iota \Rightarrow o$  be given. Let  $v1\_afinsq\_1 : \iota \Rightarrow o$  be given. Let  $v1\_ami\_2 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m2\_subset\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_numbers : \iota$  be given. Let  $r5\_scmfsa7b : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_scmfsa\_m : \iota \Rightarrow \iota$  be given. Let  $r6\_scmfsa7b : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r4\_scmfsa7b : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_scmfsa6b : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k5\_extpro\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_funct\_4 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k8\_memstr\_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_setfam\_1 : \iota \Rightarrow o$  be given. Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v2\_memstr\_0 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v3\_memstr\_0 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l1\_memstr\_0 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v5\_memstr\_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k6\_numbers : \iota$  be given. Let  $v3\_extpro\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l1\_extpro\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r1\_extpro\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k6\_extpro\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k8\_extpro\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v2\_xxreal\_0 : \iota \Rightarrow o$  be given. Let  $k4\_ordinal1 : \iota$  be given. Let  $v1\_extpro\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l1\_compos\_1 : \iota \Rightarrow o$  be given. Let  $v7\_ordinal1 : \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned}
& \forall X0. (\neg v1\_setfam\_1 X0) \Rightarrow (\forall X1. ((\neg v2\_struct\_0 X1) \wedge \\
& ((v2\_memstr\_0 X1 X0) \wedge ((v3\_memstr\_0 X1 X0) \wedge (l1\_memstr\_0 X1 X0)))) \Rightarrow \\
& (\forall X2. ((v1\_relat\_1 X2) \wedge ((v4\_relat\_1 X2 (u1\_struct\_0 X1)) \wedge \\
& ((v1\_funct\_1 X2) \wedge ((v5\_funct\_1 X2 (k2\_memstr\_0 X0 X1)) \wedge (v5\_memstr\_0 \\
& X2 X0 X1 k6\_numbers)))))) \Rightarrow (k8\_memstr\_0 X0 X1 X2 = X2))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1\_xboole\_0 X0) \wedge (\neg v1\_setfam\_1 X0)) \Rightarrow (\forall X1. \\
& ((\neg v2\_struct\_0 X1) \wedge ((v2\_memstr\_0 X1 X0) \wedge ((v3\_memstr\_0 X1 X0) \wedge \\
& ((v3\_extpro\_1 X1 X0) \wedge (l1\_extpro\_1 X1 X0)))))) \Rightarrow (\forall X2.((v1\_relat\_1 \\
& X2) \wedge ((v4\_relat\_1 X2 k5\_numbers) \wedge ((v5\_relat\_1 X2 (u1\_compos\_1 \\
& X1)) \wedge (v1\_funct\_1 X2)))))) \Rightarrow (\forall X3.((v1\_relat\_1 X3) \wedge ((v4\_relat\_1 \\
& X3 (u1\_struct\_0 X1)) \wedge (v1\_funct\_1 X3) \wedge ((v5\_funct\_1 X3 (k2\_memstr\_0 \\
& X0 X1)) \wedge (v1\_partfun1 X3 (u1\_struct\_0 X1)))))) \Rightarrow ((r1\_extpro\_1 \\
& X0 X1 X2 X3) \Rightarrow (k6\_extpro\_1 X0 X1 X2 X3 = k5\_extpro\_1 X0 X1 X2 X3 (k8\_extpro\_1 \\
& X0 X1 X2 X3))))))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 X0 (u1\_struct\_0 k1\_scmfsa\_2)) \wedge \\
& ((v1\_funct\_1 X0) \wedge ((v5\_funct\_1 X0 (k2\_memstr\_0 np\_3 k1\_scmfsa\_2)) \wedge \\
& (v1\_partfun1 X0 (u1\_struct\_0 k1\_scmfsa\_2)))))) \Rightarrow (\forall X1. \\
& ((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 k5\_numbers) \wedge ((v5\_relat\_1 X1 \\
& (u1\_compos\_1 k1\_scmfsa\_2)) \wedge (v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 \\
& k5\_numbers)))))) \Rightarrow (\forall X2.((\neg v1\_xboole\_0 X2) \wedge ((v1\_relat\_1 \\
& X2) \wedge ((v4\_relat\_1 X2 k5\_numbers) \wedge ((v5\_relat\_1 X2 (u1\_compos\_1 \\
& k1\_scmfsa\_2)) \wedge (v1\_funct\_1 X2) \wedge ((v1\_finset\_1 X2) \wedge (v1\_afinsq\_1 \\
& X2)))))) \Rightarrow (\forall X3.((v1\_ami\_2 X3) \wedge (m1\_subset\_1 X3 (u1\_struct\_0 \\
& k1\_scmfsa\_2))) \Rightarrow ((r5\_scmfsa7b X2 X0 X1) \Rightarrow ((r4\_scmfsa7b X2 X3) \vee \\
& (\forall X4.(m2\_subset\_1 X4 k1\_numbers k5\_numbers) \Rightarrow (k1\_funct\_1 \\
& (k5\_extpro\_1 np\_3 k1\_scmfsa\_2 (k1\_funct\_4 X1 X2) (k8\_memstr\_0 \\
& np\_3 k1\_scmfsa\_2 X0) X4) X3 = k1\_funct\_1 X0 X3))))))
\end{aligned} \tag{3}$$

Assume the following.

$$((v2\_xxreal\_0 np\_3) \wedge (m2\_subset\_1 np\_3 k1\_numbers k5\_numbers)) \wedge \\
((m1\_subset\_1 np\_3 k5\_numbers) \wedge (m1\_subset\_1 np\_3 k1\_numbers)) \tag{4}$$

Assume the following.

$$\neg v1\_xboole\_0 np\_3 \tag{5}$$

Assume the following.

$$k5\_numbers = k4\_ordinal1 \tag{6}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. (((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 \\
& X1 X0) \wedge (v1\_funct\_1 X1))) \wedge ((v1\_relat\_1 X2) \wedge ((v4\_relat\_1 X2 X0) \wedge \\
& (v1\_funct\_1 X2)))) \Rightarrow ((v1\_relat\_1 (k1\_funct\_4 X1 X2)) \wedge ((v4\_relat\_1 \\
& (k1\_funct\_4 X1 X2) X0) \wedge (v1\_funct\_1 (k1\_funct\_4 X1 X2))))
\end{aligned} \tag{7}$$

Assume the following.

$$(v3\_memstr\_0 k1\_scmfsa\_2 np\_3) \wedge (v1\_extpro\_1 k1\_scmfsa\_2 np\_3) \tag{8}$$

Assume the following.

$$\begin{aligned} & \forall X0.((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 X0 (u1\_struct\_0 k1\_scmfsa\_2)) \wedge \\ & ((v1\_funct\_1 X0) \wedge ((v5\_funct\_1 X0 (k2\_memstr\_0 np\_3 k1\_scmfsa\_2)) \wedge \\ & (v1\_partfun1 X0 (u1\_struct\_0 k1\_scmfsa\_2)))))) \Rightarrow ((v1\_relat\_1 \\ & (k1\_scmfsa\_m X0)) \wedge ((v4\_relat\_1 (k1\_scmfsa\_m X0) (u1\_struct\_0 \\ & k1\_scmfsa\_2)) \wedge ((v1\_funct\_1 (k1\_scmfsa\_m X0)) \wedge ((v5\_funct\_1 \\ & (k1\_scmfsa\_m X0) (k2\_memstr\_0 np\_3 k1\_scmfsa\_2)) \wedge (v1\_partfun1 \\ & (k1\_scmfsa\_m X0) (u1\_struct\_0 k1\_scmfsa\_2)))))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0.((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 X0 (u1\_struct\_0 k1\_scmfsa\_2)) \wedge \\ & ((v1\_funct\_1 X0) \wedge (v5\_funct\_1 X0 (k2\_memstr\_0 np\_3 k1\_scmfsa\_2)))))) \Rightarrow \\ & ((v1\_relat\_1 (k1\_scmfsa\_m X0)) \wedge ((v4\_relat\_1 (k1\_scmfsa\_m X0) \\ & (u1\_struct\_0 k1\_scmfsa\_2)) \wedge ((v1\_funct\_1 (k1\_scmfsa\_m X0)) \wedge \\ & ((v5\_funct\_1 (k1\_scmfsa\_m X0) (k2\_memstr\_0 np\_3 k1\_scmfsa\_2)) \wedge \\ & (v5\_memstr\_0 (k1\_scmfsa\_m X0) np\_3 k1\_scmfsa\_2 k6\_numbers)))))) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} & (\neg v2\_struct\_0 k1\_scmfsa\_2) \wedge ((v2\_memstr\_0 k1\_scmfsa\_2 np\_3) \wedge \\ & (v1\_extpro\_1 k1\_scmfsa\_2 np\_3)) \end{aligned} \quad (11)$$

Assume the following.

$$(v1\_extpro\_1 k1\_scmfsa\_2 np\_3) \wedge (v3\_extpro\_1 k1\_scmfsa\_2 np\_3) \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((v1\_relat\_1 X1) \wedge ((v5\_relat\_1 \\ & X1 X0) \wedge (v1\_funct\_1 X1))) \wedge ((v1\_relat\_1 X2) \wedge ((v5\_relat\_1 X2 X0) \wedge \\ & (v1\_funct\_1 X2)))) \Rightarrow ((v1\_relat\_1 (k1\_funct\_4 X1 X2)) \wedge ((v5\_relat\_1 \\ & (k1\_funct\_4 X1 X2) X0) \wedge (v1\_funct\_1 (k1\_funct\_4 X1 X2)))) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (l1\_extpro\_1 X1 X0) \Rightarrow ((l1\_memstr\_0 X1 X0) \wedge \\ & (l1\_compos\_1 X1)) \end{aligned} \quad (14)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. (((\neg v1\_xboole\_0 \\ & X0) \wedge (\neg v1\_setfam\_1 X0)) \wedge (((\neg v2\_struct\_0 X1) \wedge ((v2\_memstr\_0 X1 \\ & X0) \wedge ((v3\_memstr\_0 X1 X0) \wedge ((v3\_extpro\_1 X1 X0) \wedge (l1\_extpro\_1 X1 \\ & X0)))))) \wedge (((v1\_relat\_1 X2) \wedge ((v4\_relat\_1 X2 k5\_numbers) \wedge ((v5\_relat\_1 \\ & X2 (u1\_compos\_1 X1)) \wedge (v1\_funct\_1 X2)))) \wedge ((v1\_relat\_1 X3) \wedge (( \\ & v4\_relat\_1 X3 (u1\_struct\_0 X1)) \wedge ((v1\_funct\_1 X3) \wedge ((v5\_funct\_1 \\ & X3 (k2\_memstr\_0 X0 X1)) \wedge (v1\_partfun1 X3 (u1\_struct\_0 X1))))))))) \Rightarrow \\ & (m2\_subset\_1 (k8\_extpro\_1 X0 X1 X2 X3) k1\_numbers k5\_numbers) \end{aligned} \quad (15)$$

Assume the following.

$$\begin{aligned} & \forall X0.((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 X0 (u1\_struct\_0 k1\_scmfsa\_2)) \wedge \\ & ((v1\_funct\_1 X0) \wedge (v5\_funct\_1 X0 (k2\_memstr\_0 np\_3 k1\_scmfsa\_2)))))) \Rightarrow \\ & ((v1\_relat\_1 (k1\_scmfsa\_m X0)) \wedge ((v4\_relat\_1 (k1\_scmfsa\_m X0) \\ & (u1\_struct\_0 k1\_scmfsa\_2)) \wedge ((v1\_funct\_1 (k1\_scmfsa\_m X0)) \wedge \\ & (v5\_funct\_1 (k1\_scmfsa\_m X0) (k2\_memstr\_0 np\_3 k1\_scmfsa\_2)))))) \end{aligned} \quad (16)$$

Assume the following.

$$(v1\_extpro\_1 k1\_scmfsa\_2 np\_3) \wedge (l1\_extpro\_1 k1\_scmfsa\_2 np\_3) \quad (17)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((v1\_relat\_1 X0) \wedge (v1\_funct\_1 X0)) \wedge (( \\ & v1\_relat\_1 X1) \wedge (v1\_funct\_1 X1))) \Rightarrow ((v1\_relat\_1 (k1\_funct\_4 X0 \\ & X1)) \wedge (v1\_funct\_1 (k1\_funct\_4 X0 X1))) \end{aligned} \quad (18)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v1\_xboole\_0 X0) \wedge ((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 \\ & X0 k5\_numbers) \wedge ((v5\_relat\_1 X0 (u1\_compos\_1 k1\_scmfsa\_2)) \wedge ( \\ & (v1\_funct\_1 X0) \wedge ((v1\_finset\_1 X0) \wedge (v1\_afinsq\_1 X0)))))) \Rightarrow ( \\ & \forall X1. ((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 (u1\_struct\_0 k1\_scmfsa\_2)) \wedge \\ & ((v1\_funct\_1 X1) \wedge ((v5\_funct\_1 X1 (k2\_memstr\_0 np\_3 k1\_scmfsa\_2)) \wedge \\ & (v1\_partfun1 X1 (u1\_struct\_0 k1\_scmfsa\_2)))))) \Rightarrow (\forall X2. \\ & ((v1\_relat\_1 X2) \wedge ((v4\_relat\_1 X2 k5\_numbers) \wedge ((v5\_relat\_1 X2 \\ & (u1\_compos\_1 k1\_scmfsa\_2)) \wedge ((v1\_funct\_1 X2) \wedge (v1\_partfun1 X2 \\ & k5\_numbers)))))) \Rightarrow ((r6\_scmfsa7b X0 X1 X2) \Leftrightarrow (r1\_extpro\_1 np\_3 k1\_scmfsa\_2 \\ & (k1\_funct\_4 X2 X0) (k8\_memstr\_0 np\_3 k1\_scmfsa\_2 X1)))))) \end{aligned} \quad (19)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 X0 k5\_numbers) \wedge ((v5\_relat\_1 \\ & X0 (u1\_compos\_1 k1\_scmfsa\_2)) \wedge ((\neg v1\_xboole\_0 X0) \wedge ((v1\_funct\_1 \\ & X0) \wedge ((v1\_finset\_1 X0) \wedge (v1\_afinsq\_1 X0)))))) \Rightarrow (\forall X1. ( \\ & (v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 (u1\_struct\_0 k1\_scmfsa\_2)) \wedge \\ & ((v1\_funct\_1 X1) \wedge ((v5\_funct\_1 X1 (k2\_memstr\_0 np\_3 k1\_scmfsa\_2)) \wedge \\ & (v1\_partfun1 X1 (u1\_struct\_0 k1\_scmfsa\_2)))))) \Rightarrow (\forall X2. \\ & ((v1\_relat\_1 X2) \wedge ((v4\_relat\_1 X2 k5\_numbers) \wedge ((v5\_relat\_1 X2 \\ & (u1\_compos\_1 k1\_scmfsa\_2)) \wedge ((v1\_funct\_1 X2) \wedge (v1\_partfun1 X2 \\ & k5\_numbers)))))) \Rightarrow (k1\_scmfsa6b X0 X1 X2 = k6\_extpro\_1 np\_3 k1\_scmfsa\_2 \\ & (k1\_funct\_4 X2 X0) (k1\_scmfsa\_m X1)))))) \end{aligned} \quad (20)$$

Assume the following.

$$\forall X0. (m1\_subset\_1 X0 k4\_ordinal1) \Rightarrow (v7\_ordinal1 X0) \quad (21)$$

Assume the following.

$$\forall X0.(\neg v1\_setfam\_1 X0) \Rightarrow (\neg v1\_xboole\_0 X0) \quad (22)$$

Assume the following.

$$\forall X0.((\neg v1\_xboole\_0 X0) \wedge (v7\_ordinal1 X0)) \Rightarrow ((\neg v1\_xboole\_0 X0) \wedge ((v7\_ordinal1 X0) \wedge (\neg v1\_setfam\_1 X0))) \quad (23)$$

**Theorem 1**

$$\begin{aligned} & \forall X0.((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 X0 \ k5\_numbers) \wedge ((v5\_relat\_1 \\ & X0 \ (u1\_compos\_1 \ k1\_scmf\_sa\_2)) \wedge ((v1\_funct\_1 X0) \wedge (v1\_partfun1 \\ & X0 \ k5\_numbers)))))) \Rightarrow (\forall X1.((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 \\ & X1 \ (u1\_struct\_0 \ k1\_scmf\_sa\_2)) \wedge ((v1\_funct\_1 X1) \wedge ((v5\_funct\_1 \\ & X1 \ (k2\_memstr\_0 \ np\_3 \ k1\_scmf\_sa\_2)) \wedge (v1\_partfun1 \ X1 \ (u1\_struct\_0 \\ & k1\_scmf\_sa\_2)))))) \Rightarrow (\forall X2.((\neg v1\_xboole\_0 X2) \wedge ((v1\_relat\_1 \\ & X2) \wedge ((v4\_relat\_1 X2 \ k5\_numbers) \wedge ((v5\_relat\_1 X2 \ (u1\_compos\_1 \\ & k1\_scmf\_sa\_2)) \wedge ((v1\_funct\_1 X2) \wedge ((v1\_finset\_1 X2) \wedge (v1\_afinsq\_1 \\ & X2)))))) \Rightarrow (\forall X3.((v1\_ami\_2 X3) \wedge (m1\_subset\_1 X3 \ (u1\_struct\_0 \\ & k1\_scmf\_sa\_2))) \Rightarrow (\forall X4.(m2\_subset\_1 X4 \ k1\_numbers \ k5\_numbers) \Rightarrow \\ & ((r5\_scmf\_sa7b \ X2 \ (k1\_scmf\_sa\_m \ X1) \ X0) \wedge (r6\_scmf\_sa7b \ X2 \ (k1\_scmf\_sa\_m \\ & X1) \ X0)) \Rightarrow ((r4\_scmf\_sa7b \ X2 \ X3) \vee (k1\_funct\_1 \ (k1\_scmf\_sa6b \ X2 \ X1 \ X0) \\ & X3 = k1\_funct\_1 \ (k5\_extpro\_1 \ np\_3 \ k1\_scmf\_sa\_2 \ (k1\_funct\_4 \ X0 \ X2) \\ & (k8\_memstr\_0 \ np\_3 \ k1\_scmf\_sa\_2 \ (k1\_scmf\_sa\_m \ X1) \ X4) \ X3)))))) \end{aligned}$$