

t8\_scpisort  
(TMK4URhUyqiAPjngk8AnbXcnE63T4LEAKmf)

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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  $k1\_scmpds\_2 : \iota$  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  $np\_2 : \iota$  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  $v2\_scmpds\_4 : \iota \Rightarrow o$  be given. Let  $v3\_scmpds\_4 : \iota \Rightarrow o$  be given. Let  $r1\_scmpds\_6 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r2\_scmpds\_6 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_scmpds\_4 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_scmpds\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k8\_memstr\_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_scmpds\_4 : \iota \Rightarrow o$  be given. Let  $v2\_xxreal\_0 : \iota \Rightarrow o$  be given. Let  $m2\_subset\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_numbers : \iota$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k4\_ordinal1 : \iota$  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  $v1\_extpro\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v1\_setfam\_1 : \iota \Rightarrow o$  be given. Let  $l1\_memstr\_0 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l1\_extpro\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l1\_compos\_1 : \iota \Rightarrow o$  be given. Let  $v7\_ordinal1 : \iota \Rightarrow o$  be given. Assume the

following.

$$\begin{aligned}
& \forall X0.((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 X0 (u1\_struct\_0 k1\_scmpds\_2)) \wedge \\
& ((v1\_funct\_1 X0) \wedge ((v5\_funct\_1 X0 (k2\_memstr\_0 np\_2 k1\_scmpds\_2)) \wedge \\
& (v1\_partfun1 X0 (u1\_struct\_0 k1\_scmpds\_2)))))) \Rightarrow (\forall X1. \\
& ((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 k5\_numbers) \wedge ((v5\_relat\_1 X1 \\
& (u1\_compos\_1 k1\_scmpds\_2)) \wedge ((v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 \\
& k5\_numbers)))))) \Rightarrow (\forall X2.((\neg v1\_xboole\_0 X2) \wedge ((v1\_relat\_1 \\
& X2) \wedge ((v4\_relat\_1 X2 k5\_numbers) \wedge ((v5\_relat\_1 X2 (u1\_compos\_1 \\
& k1\_scmpds\_2)) \wedge ((v1\_funct\_1 X2) \wedge ((v1\_finset\_1 X2) \wedge (v1\_afinsq\_1 \\
& X2)))))) \Rightarrow (\forall X3.((\neg v1\_xboole\_0 X3) \wedge ((v1\_relat\_1 X3) \wedge \\
& ((v4\_relat\_1 X3 k5\_numbers) \wedge ((v5\_relat\_1 X3 (u1\_compos\_1 k1\_scmpds\_2)) \wedge \\
& ((v1\_funct\_1 X3) \wedge ((v1\_finset\_1 X3) \wedge ((v1\_afinsq\_1 X3) \wedge (v3\_scmpds\_4 \\
& X3)))))) \Rightarrow (((r1\_scmpds\_6 X2 X0 X1) \wedge ((r2\_scmpds\_6 X2 X0 X1) \wedge ( \\
& (r1\_scmpds\_6 X3 (k6\_scmpds\_4 X2 (k8\_memstr\_0 np\_2 k1\_scmpds\_2 \\
& X0) X1) X1) \wedge (r2\_scmpds\_6 X3 (k6\_scmpds\_4 X2 (k8\_memstr\_0 np\_2 \\
& k1\_scmpds\_2 X0) X1) X1)))) \Rightarrow ((r1\_scmpds\_6 (k1\_scmpds\_4 X2 X3) X0 \\
& X1) \wedge (r2\_scmpds\_6 (k1\_scmpds\_4 X2 X3) X0 X1))))))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1\_xboole\_0 X0) \wedge ((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 \\
& X0 k5\_numbers) \wedge ((v5\_relat\_1 X0 (u1\_compos\_1 k1\_scmpds\_2)) \wedge ( \\
& (v1\_funct\_1 X0) \wedge ((v1\_finset\_1 X0) \wedge (v1\_afinsq\_1 X0)))))) \Rightarrow ( \\
& (v2\_scmpds\_4 X0) \Leftrightarrow (\forall X1.((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 \\
& X1 (u1\_struct\_0 k1\_scmpds\_2)) \wedge ((v1\_funct\_1 X1) \wedge ((v5\_funct\_1 \\
& X1 (k2\_memstr\_0 np\_2 k1\_scmpds\_2)) \wedge (v1\_partfun1 X1 (u1\_struct\_0 \\
& k1\_scmpds\_2)))))) \Rightarrow (\forall X2.((v1\_relat\_1 X2) \wedge ((v4\_relat\_1 \\
& X2 k5\_numbers) \wedge ((v5\_relat\_1 X2 (u1\_compos\_1 k1\_scmpds\_2)) \wedge ( \\
& (v1\_funct\_1 X2) \wedge (v1\_partfun1 X2 k5\_numbers)))))) \Rightarrow (r2\_scmpds\_6 \\
& X0 X1 X2)))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1\_xboole\_0 X0) \wedge ((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 \\
& X0 k5\_numbers) \wedge ((v5\_relat\_1 X0 (u1\_compos\_1 k1\_scmpds\_2)) \wedge ( \\
& (v1\_funct\_1 X0) \wedge ((v1\_finset\_1 X0) \wedge (v1\_afinsq\_1 X0)))))) \Rightarrow ( \\
& (v1\_scmpds\_4 X0) \Leftrightarrow (\forall X1.((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 \\
& X1 (u1\_struct\_0 k1\_scmpds\_2)) \wedge ((v1\_funct\_1 X1) \wedge ((v5\_funct\_1 \\
& X1 (k2\_memstr\_0 np\_2 k1\_scmpds\_2)) \wedge (v1\_partfun1 X1 (u1\_struct\_0 \\
& k1\_scmpds\_2)))))) \Rightarrow (\forall X2.((v1\_relat\_1 X2) \wedge ((v4\_relat\_1 \\
& X2 k5\_numbers) \wedge ((v5\_relat\_1 X2 (u1\_compos\_1 k1\_scmpds\_2)) \wedge ( \\
& (v1\_funct\_1 X2) \wedge (v1\_partfun1 X2 k5\_numbers)))))) \Rightarrow (r1\_scmpds\_6 \\
& X0 X1 X2)))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned} & ((v2\_xreal\_0 \ np\_2) \wedge (m2\_subset\_1 \ np\_2 \ k1\_numbers \ k5\_numbers)) \wedge \\ & ((m1\_subset\_1 \ np\_2 \ k5\_numbers) \wedge (m1\_subset\_1 \ np\_2 \ k1\_numbers)) \end{aligned} \quad (4)$$

Assume the following.

$$\neg v1\_xboole\_0 \ np\_2 \quad (5)$$

Assume the following.

$$k5\_numbers = k4\_ordinal1 \quad (6)$$

Assume the following.

$$\begin{aligned} & (v2\_memstr\_0 \ k1\_scmpds\_2 \ np\_2) \wedge ((v3\_memstr\_0 \ k1\_scmpds\_2 \ np\_2) \wedge \\ & (v1\_extpro\_1 \ k1\_scmpds\_2 \ np\_2)) \end{aligned} \quad (7)$$

Assume the following.

$$(\neg v2\_struct\_0 \ k1\_scmpds\_2) \wedge (v1\_extpro\_1 \ k1\_scmpds\_2 \ np\_2) \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. ((\neg v1\_setfam\_1 \ X0) \wedge (((\neg v2\_struct\_0 \\ & X1) \wedge ((v2\_memstr\_0 \ X1 \ X0) \wedge ((v3\_memstr\_0 \ X1 \ X0) \wedge (l1\_memstr\_0 \ X1 \\ & X0)))) \wedge ((v1\_relat\_1 \ X2) \wedge ((v4\_relat\_1 \ X2 \ (u1\_struct\_0 \ X1)) \wedge \\ & (v1\_funct\_1 \ X2) \wedge ((v5\_funct\_1 \ X2 \ (k2\_memstr\_0 \ X0 \ X1)) \wedge (v1\_partfun1 \\ & X2 \ (u1\_struct\_0 \ X1)))))) \Rightarrow ((v1\_relat\_1 \ (k8\_memstr\_0 \ X0 \ X1 \ X2)) \wedge \\ & ((v4\_relat\_1 \ (k8\_memstr\_0 \ X0 \ X1 \ X2) \ (u1\_struct\_0 \ X1)) \wedge ((v1\_funct\_1 \\ & (k8\_memstr\_0 \ X0 \ X1 \ X2)) \wedge ((v5\_funct\_1 \ (k8\_memstr\_0 \ X0 \ X1 \ X2) \ (k2\_memstr\_0 \\ & X0 \ X1)) \wedge (v1\_partfun1 \ (k8\_memstr\_0 \ X0 \ X1 \ X2) \ (u1\_struct\_0 \ X1)))))) \end{aligned} \quad (9)$$

Assume the following.

$$\forall X0. \forall X1. (l1\_extpro\_1 \ X1 \ X0) \Rightarrow ((l1\_memstr\_0 \ X1 \ X0) \wedge (l1\_compos\_1 \ X1)) \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. ((\neg v1\_setfam\_1 \ X0) \wedge (((\neg v2\_struct\_0 \\ & X1) \wedge ((v2\_memstr\_0 \ X1 \ X0) \wedge ((v3\_memstr\_0 \ X1 \ X0) \wedge (l1\_memstr\_0 \ X1 \\ & X0)))) \wedge ((v1\_relat\_1 \ X2) \wedge ((v4\_relat\_1 \ X2 \ (u1\_struct\_0 \ X1)) \wedge \\ & (v1\_funct\_1 \ X2) \wedge ((v5\_funct\_1 \ X2 \ (k2\_memstr\_0 \ X0 \ X1)))))) \Rightarrow ((v1\_relat\_1 \\ & (k8\_memstr\_0 \ X0 \ X1 \ X2)) \wedge ((v4\_relat\_1 \ (k8\_memstr\_0 \ X0 \ X1 \ X2) \ (u1\_struct\_0 \\ & X1)) \wedge ((v1\_funct\_1 \ (k8\_memstr\_0 \ X0 \ X1 \ X2)) \wedge ((v5\_funct\_1 \ (k8\_memstr\_0 \\ & X0 \ X1 \ X2) \ (k2\_memstr\_0 \ X0 \ X1)))))) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.(((\neg v1\_xboole\_0 X0)\wedge((v1\_relat\_1 \\
& X0)\wedge((v4\_relat\_1 X0 k5\_numbers)\wedge((v5\_relat\_1 X0 (u1\_compos\_1 \\
& k1\_scmpds\_2))\wedge((v1\_funct\_1 X0)\wedge((v1\_finset\_1 X0)\wedge(v1\_afinsq\_1 \\
& X0))))))\wedge(((v1\_relat\_1 X1)\wedge((v4\_relat\_1 X1 (u1\_struct\_0 k1\_scmpds\_2))\wedge \\
& ((v1\_funct\_1 X1)\wedge((v5\_funct\_1 X1 (k2\_memstr\_0 np\_2 k1\_scmpds\_2))\wedge \\
& (v1\_partfun1 X1 (u1\_struct\_0 k1\_scmpds\_2))))))\wedge((v1\_relat\_1 \\
& X2)\wedge((v4\_relat\_1 X2 k5\_numbers)\wedge((v5\_relat\_1 X2 (u1\_compos\_1 \\
& k1\_scmpds\_2))\wedge((v1\_funct\_1 X2)\wedge(v1\_partfun1 X2 k5\_numbers))))))\Rightarrow \\
& ((v1\_relat\_1 (k6\_scmpds\_4 X0 X1 X2))\wedge((v4\_relat\_1 (k6\_scmpds\_4 \\
& X0 X1 X2) (u1\_struct\_0 k1\_scmpds\_2))\wedge((v1\_funct\_1 (k6\_scmpds\_4 \\
& X0 X1 X2))\wedge((v5\_funct\_1 (k6\_scmpds\_4 X0 X1 X2) (k2\_memstr\_0 np\_2 \\
& k1\_scmpds\_2))\wedge(v1\_partfun1 (k6\_scmpds\_4 X0 X1 X2) (u1\_struct\_0 \\
& k1\_scmpds\_2))))))
\end{aligned} \tag{12}$$

Assume the following.

$$(v1\_extpro\_1 k1\_scmpds\_2 np\_2)\wedge(l1\_extpro\_1 k1\_scmpds\_2 np\_2) \tag{13}$$

Assume the following.

$$\forall X0.(m1\_subset\_1 X0 k4\_ordinal1)\Rightarrow(v7\_ordinal1 X0) \tag{14}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(((\neg v1\_xboole\_0 X0)\wedge((v1\_relat\_1 X0)\wedge((v4\_relat\_1 \\
& X0 k5\_numbers)\wedge((v5\_relat\_1 X0 (u1\_compos\_1 k1\_scmpds\_2))\wedge( \\
& (v1\_funct\_1 X0)\wedge((v1\_finset\_1 X0)\wedge((v1\_afinsq\_1 X0)\wedge(v2\_scmpds\_4 \\
& X0))))))\wedge(((\neg v1\_xboole\_0 X0)\wedge((v1\_relat\_1 X0)\wedge((v4\_relat\_1 \\
& X0 k5\_numbers)\wedge((v5\_relat\_1 X0 (u1\_compos\_1 k1\_scmpds\_2))\wedge( \\
& (v1\_funct\_1 X0)\wedge((v1\_finset\_1 X0)\wedge((v1\_afinsq\_1 X0)\wedge(v1\_scmpds\_4 \\
& X0)))))))))
\end{aligned} \tag{15}$$

Assume the following.

$$\forall X0.(((\neg v1\_xboole\_0 X0)\wedge(v7\_ordinal1 X0))\Rightarrow((\neg v1\_xboole\_0 \\
X0)\wedge((v7\_ordinal1 X0)\wedge(\neg v1\_setfam\_1 X0))) \tag{16}$$

**Theorem 1**

$$\begin{aligned} & \forall X0.((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 X0 k5\_numbers) \wedge ((v5\_relat\_1 \\ & X0 (u1\_compos\_1 k1\_scmpds\_2)) \wedge ((v1\_funct\_1 X0) \wedge (v1\_partfun1 \\ & X0 k5\_numbers)))))) \Rightarrow (\forall X1.((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 \\ & X1 (u1\_struct\_0 k1\_scmpds\_2)) \wedge ((v1\_funct\_1 X1) \wedge ((v5\_funct\_1 \\ & X1 (k2\_memstr\_0 np\_2 k1\_scmpds\_2)) \wedge (v1\_partfun1 X1 (u1\_struct\_0 \\ & k1\_scmpds\_2)))))) \Rightarrow (\forall X2.((\neg v1\_xboole\_0 X2) \wedge ((v1\_relat\_1 \\ & X2) \wedge ((v4\_relat\_1 X2 k5\_numbers) \wedge ((v5\_relat\_1 X2 (u1\_compos\_1 \\ & k1\_scmpds\_2)) \wedge ((v1\_funct\_1 X2) \wedge ((v1\_finset\_1 X2) \wedge (v1\_afinsq\_1 \\ & X2)))))) \Rightarrow (\forall X3.((\neg v1\_xboole\_0 X3) \wedge ((v1\_relat\_1 X3) \wedge \\ & ((v4\_relat\_1 X3 k5\_numbers) \wedge ((v5\_relat\_1 X3 (u1\_compos\_1 k1\_scmpds\_2)) \wedge \\ & ((v1\_funct\_1 X3) \wedge ((v1\_finset\_1 X3) \wedge ((v1\_afinsq\_1 X3) \wedge ((v2\_scmpds\_4 \\ & X3) \wedge (v3\_scmpds\_4 X3)))))))))) \Rightarrow (((r1\_scmpds\_6 X2 X1 X0) \wedge (r2\_scmpds\_6 \\ & X2 X1 X0)) \Rightarrow ((r1\_scmpds\_6 (k1\_scmpds\_4 X2 X3) X1 X0) \wedge (r2\_scmpds\_6 \\ & (k1\_scmpds\_4 X2 X3) X1 X0)))))) \end{aligned}$$