

# t27\_scmisort (TMEzpKt- mvVUEw4g74DdY3AXqUfyiKfhjaAG)

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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  $v2\_scm\_halt : \iota \Rightarrow o$  be given. Let  $v1\_scmfsa7b : \iota \Rightarrow o$  be given. Let  $v1\_ami\_2 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_scmfsa\_m : \iota \Rightarrow o$  be given. Let  $k2\_scmfsa\_9 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r1\_xxreal\_0 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_numbers : \iota$  be given. Let  $k1\_scmfsa6b : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m1\_scmfsa\_2 : \iota \Rightarrow o$  be given. Let  $k18\_scmfsa\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_memstr\_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned}
& \forall X0. ((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 X0 (u1\_struct\_0 k1\_scmfsa\_2)) \wedge \\
& ((v1\_funct\_1 X0) \wedge ((v5\_funct\_1 X0 (k2\_memstr\_0 np\_3 k1\_scmfsa\_2)) \wedge \\
& (v1\_partfun1 X0 (u1\_struct\_0 k1\_scmfsa\_2)))))) \Rightarrow (\forall X1. \\
& ((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 (u1\_struct\_0 k1\_scmfsa\_2)) \wedge \\
& ((v1\_funct\_1 X1) \wedge ((v5\_funct\_1 X1 (k2\_memstr\_0 np\_3 k1\_scmfsa\_2)) \wedge \\
& (v1\_partfun1 X1 (u1\_struct\_0 k1\_scmfsa\_2)))))) \Rightarrow ((\forall X2. \\
& ((v1\_ami\_2 X2) \wedge (m1\_subset\_1 X2 (u1\_struct\_0 k1\_scmfsa\_2))) \Rightarrow \\
& (k1\_funct\_1 X0 X2 = k1\_funct\_1 X1 X2)) \wedge (\forall X2. (m1\_scmfsa\_2 \\
& X2) \Rightarrow (k18\_scmfsa\_2 X0 X2 = k18\_scmfsa\_2 X1 X2))) \Leftrightarrow (k6\_memstr\_0 np\_3 \\
& k1\_scmfsa\_2 X0 = k6\_memstr\_0 np\_3 k1\_scmfsa\_2 X1))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 X0 k5\_numbers) \wedge ((v5\_relat\_1 \\
& X0 (u1\_compos\_1 k1\_scmfsa\_2)) \wedge ((v1\_funct\_1 X0) \wedge (v1\_partfun1 \\
& X0 k5\_numbers)))) \Rightarrow (\forall X1.((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 \\
& X1 (u1\_struct\_0 k1\_scmfsa\_2)) \wedge ((v1\_funct\_1 X1) \wedge ((v5\_funct\_1 \\
& X1 (k2\_memstr\_0 np\_3 k1\_scmfsa\_2)) \wedge (v1\_partfun1 X1 (u1\_struct\_0 \\
& k1\_scmfsa\_2)))))) \Rightarrow (\forall X2.((\neg v1\_xboole\_0 X2) \wedge ((v1\_relat\_1 \\
& X2) \wedge ((v4\_relat\_1 X2 k5\_numbers) \wedge ((v5\_relat\_1 X2 (u1\_compos\_1 \\
& k1\_scmfsa\_2)) \wedge ((v1\_funct\_1 X2) \wedge ((v1\_finset\_1 X2) \wedge ((v1\_afinsq\_1 \\
& X2) \wedge ((v2\_scm\_halt X2) \wedge (v1\_scmfsa7b X2)))))))))) \Rightarrow (\forall X3. \\
& ((v1\_ami\_2 X3) \wedge ((\neg v1\_scmfsa\_m X3) \wedge (m1\_subset\_1 X3 (u1\_struct\_0 \\
& k1\_scmfsa\_2)))) \Rightarrow ((v2\_scm\_halt (k2\_scmfsa\_9 X3 X2)) \Rightarrow ((r1\_xreal\_0 \\
& (k1\_funct\_1 X1 X3) k6\_numbers) \vee (k6\_memstr\_0 np\_3 k1\_scmfsa\_2 \\
& (k1\_scmfsa6b (k2\_scmfsa\_9 X3 X2) X1 X0) = k6\_memstr\_0 np\_3 k1\_scmfsa\_2 \\
& (k1\_scmfsa6b (k2\_scmfsa\_9 X3 X2) (k1\_scmfsa6b X2 X1 X0) X0))))))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. (((v1\_ami\_2 X0) \wedge (m1\_subset\_1 X0 (u1\_struct\_0 \\
& k1\_scmfsa\_2))) \wedge ((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 k5\_numbers) \wedge \\
& ((v5\_relat\_1 X1 (u1\_compos\_1 k1\_scmfsa\_2)) \wedge ((\neg v1\_xboole\_0 X1) \wedge \\
& ((v1\_funct\_1 X1) \wedge ((v1\_finset\_1 X1) \wedge (v1\_afinsq\_1 X1)))))) \Rightarrow \\
& ((v1\_relat\_1 (k2\_scmfsa\_9 X0 X1)) \wedge ((v4\_relat\_1 (k2\_scmfsa\_9 \\
& X0 X1) k5\_numbers) \wedge ((v5\_relat\_1 (k2\_scmfsa\_9 X0 X1) (u1\_compos\_1 \\
& k1\_scmfsa\_2)) \wedge ((\neg v1\_xboole\_0 (k2\_scmfsa\_9 X0 X1)) \wedge ((v1\_funct\_1 \\
& (k2\_scmfsa\_9 X0 X1)) \wedge ((v1\_finset\_1 (k2\_scmfsa\_9 X0 X1)) \wedge (v1\_afinsq\_1 \\
& (k2\_scmfsa\_9 X0 X1))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. (((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 \\
& X0 k5\_numbers) \wedge ((v5\_relat\_1 X0 (u1\_compos\_1 k1\_scmfsa\_2)) \wedge ( \\
& (\neg v1\_xboole\_0 X0) \wedge ((v1\_funct\_1 X0) \wedge ((v1\_finset\_1 X0) \wedge (v1\_afinsq\_1 \\
& X0)))))) \wedge ((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 (u1\_struct\_0 k1\_scmfsa\_2)) \wedge \\
& ((v1\_funct\_1 X1) \wedge ((v5\_funct\_1 X1 (k2\_memstr\_0 np\_3 k1\_scmfsa\_2)) \wedge \\
& (v1\_partfun1 X1 (u1\_struct\_0 k1\_scmfsa\_2)))))) \wedge ((v1\_relat\_1 \\
& X2) \wedge ((v4\_relat\_1 X2 k5\_numbers) \wedge ((v5\_relat\_1 X2 (u1\_compos\_1 \\
& k1\_scmfsa\_2)) \wedge ((v1\_funct\_1 X2) \wedge (v1\_partfun1 X2 k5\_numbers)))))) \Rightarrow \\
& ((v1\_relat\_1 (k1\_scmfsa6b X0 X1 X2)) \wedge ((v4\_relat\_1 (k1\_scmfsa6b \\
& X0 X1 X2) (u1\_struct\_0 k1\_scmfsa\_2)) \wedge ((v1\_funct\_1 (k1\_scmfsa6b \\
& X0 X1 X2)) \wedge ((v5\_funct\_1 (k1\_scmfsa6b X0 X1 X2) (k2\_memstr\_0 np\_3 \\
& k1\_scmfsa\_2)) \wedge (v1\_partfun1 (k1\_scmfsa6b X0 X1 X2) (u1\_struct\_0 \\
& k1\_scmfsa\_2))))))
\end{aligned} \tag{4}$$

**Theorem 1**

$$\begin{aligned} & \forall X0.((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 X0 k5\_numbers) \wedge ((v5\_relat\_1 \\ & X0 (u1\_compos\_1 k1\_scmfsa\_2)) \wedge ((v1\_funct\_1 X0) \wedge (v1\_partfun1 \\ & X0 k5\_numbers)))))) \Rightarrow (\forall X1.((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 \\ & X1 (u1\_struct\_0 k1\_scmfsa\_2)) \wedge ((v1\_funct\_1 X1) \wedge ((v5\_funct\_1 \\ & X1 (k2\_memstr\_0 np\_3 k1\_scmfsa\_2)) \wedge (v1\_partfun1 X1 (u1\_struct\_0 \\ & k1\_scmfsa\_2)))))) \Rightarrow (\forall X2.((\neg v1\_xboole\_0 X2) \wedge ((v1\_relat\_1 \\ & X2) \wedge ((v4\_relat\_1 X2 k5\_numbers) \wedge ((v5\_relat\_1 X2 (u1\_compos\_1 \\ & k1\_scmfsa\_2)) \wedge ((v1\_funct\_1 X2) \wedge ((v1\_finset\_1 X2) \wedge ((v1\_afinsq\_1 \\ & X2) \wedge ((v2\_scm\_halt X2) \wedge (v1\_scmfsa7b X2)))))))))) \Rightarrow (\forall X3. \\ & ((v1\_ami\_2 X3) \wedge (m1\_subset\_1 X3 (u1\_struct\_0 k1\_scmfsa\_2))) \Rightarrow \\ & (\forall X4.((v1\_ami\_2 X4) \wedge ((\neg v1\_scmfsa\_m X4) \wedge (m1\_subset\_1 \\ & X4 (u1\_struct\_0 k1\_scmfsa\_2)))) \Rightarrow ((v2\_scm\_halt (k2\_scmfsa\_9 \\ & X4 X2)) \Rightarrow ((r1\_xxreal\_0 (k1\_funct\_1 X1 X4) k6\_numbers) \vee (k1\_funct\_1 \\ & (k1\_scmfsa6b (k2\_scmfsa\_9 X4 X2) X1 X0) X3 = k1\_funct\_1 (k1\_scmfsa6b \\ & (k2\_scmfsa\_9 X4 X2) (k1\_scmfsa6b X2 X1 X0) X0) X3)))))) \end{aligned}$$