

# t5\_scmbsort (TMbWfXhLUdXTrYWsRuyGES- Dgsy5ekHFnvoM)

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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  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k1\_scmf\_sa\_2 : \iota$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  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  $v1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m2\_subset\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_numbers : \iota$  be given. Let  $k5\_numbers : \iota$  be given. Let  $v1\_ami\_2 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_nat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $np\_1 : \iota$  be given. Let  $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_extpro\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_scmf\_sa\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_scmf\_sa\_2 : \iota \Rightarrow \iota$  be given. Let  $k1\_scmf\_sa\_m : \iota \Rightarrow \iota$  be given. Let  $k4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k4\_card\_1 : \iota \Rightarrow \iota$  be given. Let  $k5\_memstr\_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m1\_scmf\_sa\_2 : \iota \Rightarrow o$  be given. Let  $r2\_relset\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k4\_numbers : \iota$  be given. Let  $k18\_scmf\_sa\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_scmf\_sa\_m : \iota \Rightarrow o$  be given. Let  $v7\_ordinal1 : \iota \Rightarrow o$  be given. Let  $v2\_xxreal\_0 : \iota \Rightarrow o$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $k4\_ordinal1 : \iota$  be given. Let  $k2\_xcmplx\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v3\_ordinal1 : \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned}
& \forall X0. ((v1\_ami\_2 X0) \wedge (m1\_subset\_1 X0 (u1\_struct\_0 k1\_scmf\_sa\_2))) \Rightarrow \\
& (\forall X1. ((v1\_ami\_2 X1) \wedge (m1\_subset\_1 X1 (u1\_struct\_0 k1\_scmf\_sa\_2))) \Rightarrow \\
& (\forall X2. ((v1\_relat\_1 X2) \wedge ((v4\_relat\_1 X2 (u1\_struct\_0 k1\_scmf\_sa\_2)) \wedge \\
& ((v1\_funct\_1 X2) \wedge ((v5\_funct\_1 X2 (k2\_memstr\_0 np\_3 k1\_scmf\_sa\_2)) \wedge \\
& (v1\_partfun1 X2 (u1\_struct\_0 k1\_scmf\_sa\_2)))))) \Rightarrow ((k1\_funct\_1 \\
& (k2\_extpro\_1 np\_3 k1\_scmf\_sa\_2 (k6\_scmf\_sa\_2 X0 X1) X2) (k4\_struct\_0 \\
& k1\_scmf\_sa\_2) = k4\_card\_1 (k5\_memstr\_0 np\_3 k1\_scmf\_sa\_2 X2)) \wedge \\
& ((k1\_funct\_1 (k2\_extpro\_1 np\_3 k1\_scmf\_sa\_2 (k6\_scmf\_sa\_2 X0 X1) \\
& X2) X0 = k1\_funct\_1 X2 X1) \wedge ((\forall X3. ((v1\_ami\_2 X3) \wedge (m1\_subset\_1 \\
& X3 (u1\_struct\_0 k1\_scmf\_sa\_2))) \Rightarrow ((X3 \neq X0) \Rightarrow (k1\_funct\_1 (k2\_extpro\_1 \\
& np\_3 k1\_scmf\_sa\_2 (k6\_scmf\_sa\_2 X0 X1) X2) X3 = k1\_funct\_1 X2 X3)))) \wedge \\
& (\forall X3. (m1\_scmf\_sa\_2 X3) \Rightarrow (r2\_relset\_1 k5\_numbers k4\_numbers \\
& (k18\_scmf\_sa\_2 (k2\_extpro\_1 np\_3 k1\_scmf\_sa\_2 (k6\_scmf\_sa\_2 X0 \\
& X1) X2) X3) (k18\_scmf\_sa\_2 X2 X3)))))))))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0.((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 X0 (u1\_struct\_0 k1\_scmf\_sa\_2)) \wedge \\ & ((v1\_funct\_1 X0) \wedge ((v5\_funct\_1 X0 (k2\_memstr\_0 np\_3 k1\_scmf\_sa\_2)) \wedge \\ & (v1\_partfun1 X0 (u1\_struct\_0 k1\_scmf\_sa\_2)))))) \Rightarrow ((\forall X1. \\ & ((v1\_ami\_2 X1) \wedge ((\neg v1\_scmf\_sa\_m X1) \wedge (m1\_subset\_1 X1 (u1\_struct\_0 \\ & k1\_scmf\_sa\_2)))) \Rightarrow (k1\_funct\_1 (k1\_scmf\_sa\_m X0) X1 = k1\_funct\_1 \\ & X0 X1)) \wedge (\forall X1.(m1\_scmf\_sa\_2 X1) \Rightarrow (k18\_scmf\_sa\_2 (k1\_scmf\_sa\_m \\ & X0) X1 = k18\_scmf\_sa\_2 X0 X1))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0.(v7\_ordinal1 X0) \Rightarrow (\forall X1.(v7\_ordinal1 X1) \Rightarrow (\neg \\ & (X0 \neq X1) \wedge (k4\_scmf\_sa\_2 X0 = k4\_scmf\_sa\_2 X1))) \end{aligned} \quad (3)$$

Assume the following.

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

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((\neg v1\_xboole\_0 X0) \wedge ((\neg v1\_xboole\_0 X1) \wedge \\ & (m1\_subset\_1 X1 (k1\_zfmisc\_1 X0)))) \Rightarrow (\forall X2.(m2\_subset\_1 \\ & X2 X0 X1) \Leftrightarrow (m1\_subset\_1 X2 X1)) \end{aligned} \quad (5)$$

Assume the following.

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

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((m1\_subset\_1 X0 k5\_numbers) \wedge (v7\_ordinal1 \\ & X1)) \Rightarrow (k2\_nat\_1 X0 X1 = k2\_xcmplx\_0 X0 X1) \end{aligned} \quad (7)$$

Assume the following.

$$(\neg v1\_xboole\_0 k4\_ordinal1) \wedge (v3\_ordinal1 k4\_ordinal1) \quad (8)$$

Assume the following.

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

Assume the following.

$$\neg v1\_xboole\_0 \ k1\_numbers \quad (10)$$

Assume the following.

$$\forall X0.\forall X1.((v7\_ordinal1 \ X0)\wedge(v7\_ordinal1 \ X1))\Rightarrow(v7\_ordinal1 \ (k2\_xcmplx\_0 \ X0 \ X1)) \quad (11)$$

Assume the following.

$$\forall X0.(m1\_subset\_1 \ X0 \ k5\_numbers)\Rightarrow((v1\_ami\_2 \ (k4\_scmfsa\_2 \ (k2\_nat\_1 \ X0 \ np\_1)))\wedge(\neg v1\_scmfsa\_m \ (k4\_scmfsa\_2 \ (k2\_nat\_1 \ X0 \ np\_1)))) \quad (12)$$

Assume the following.

$$m1\_subset\_1 \ k5\_numbers \ (k1\_zfmisc\_1 \ k1\_numbers) \quad (13)$$

Assume the following.

$$\forall X0.(v7\_ordinal1 \ X0)\Rightarrow((v1\_ami\_2 \ (k4\_scmfsa\_2 \ X0))\wedge(m1\_subset\_1 \ (k4\_scmfsa\_2 \ X0) \ (u1\_struct\_0 \ k1\_scmfsa\_2))) \quad (14)$$

Assume the following.

$$\forall X0.(m1\_subset\_1 \ X0 \ k4\_ordinal1)\Rightarrow(v7\_ordinal1 \ X0) \quad (15)$$

### Theorem 1

$$\begin{aligned} & \forall X0.((v1\_relat\_1 \ X0)\wedge((v4\_relat\_1 \ X0 \ (u1\_struct\_0 \ k1\_scmfsa\_2))\wedge \\ & ((v1\_funct\_1 \ X0)\wedge((v5\_funct\_1 \ X0 \ (k2\_memstr\_0 \ np\_3 \ k1\_scmfsa\_2))\wedge \\ & (v1\_partfun1 \ X0 \ (u1\_struct\_0 \ k1\_scmfsa\_2))))))\Rightarrow(\forall X1. \\ & (m2\_subset\_1 \ X1 \ k1\_numbers \ k5\_numbers)\Rightarrow(\forall X2.(m2\_subset\_1 \\ & X2 \ k1\_numbers \ k5\_numbers)\Rightarrow(\forall X3.((v1\_ami\_2 \ X3)\wedge(m1\_subset\_1 \\ & X3 \ (u1\_struct\_0 \ k1\_scmfsa\_2)))\Rightarrow((X1\neq k2\_nat\_1 \ X2 \ np\_1)\Rightarrow(k1\_funct\_1 \\ & (k2\_extpro\_1 \ np\_3 \ k1\_scmfsa\_2 \ (k6\_scmfsa\_2 \ (k4\_scmfsa\_2 \ X1) \\ & X3) \ (k1\_scmfsa\_m \ X0)) \ (k4\_scmfsa\_2 \ (k2\_nat\_1 \ X2 \ np\_1)) = k1\_funct\_1 \\ & X0 \ (k4\_scmfsa\_2 \ (k2\_nat\_1 \ X2 \ np\_1)))))) \end{aligned}$$