

t13_scmisort
(TMaBRzTCY9USLjtfCfe1osw8R8GUJpXqHEJ)

October 27, 2020

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 $k1_scmf_sa_2 : \iota$ 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 $v1_scmf_sa_m : \iota \Rightarrow o$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r1_scm_halt : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r2_scm_halt : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ 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 $k5_memstr_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ 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 $k2_scmf_sa_9 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_scmf_sa_m : \iota \Rightarrow \iota$ be given. Let $k2_nat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k8_extpro_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k6_memstr_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_scmf_sa_2 : \iota \Rightarrow \iota$ be given. Let $np_1 : \iota$ be given. Let $m1_scmf_sa_2 : \iota \Rightarrow o$ be given. Let $k18_scmf_sa_2 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r6_scmf_sa7b : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r5_scmf_sa7b : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k8_memstr_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m2_subset_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_numbers : \iota$ be given. Let $k9_xtuple_0 : \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} & \forall X0. ((v1_relat_1 X0) \wedge ((v4_relat_1 X0 (u1_struct_0 k1_scmf_sa_2)) \wedge \\ & ((v1_funct_1 X0) \wedge (v5_funct_1 X0 (k2_memstr_0 np_3 k1_scmf_sa_2)))))) \Rightarrow \\ & (k1_funct_1 (k1_scmf_sa_m X0) (k4_scmf_sa_2 k6_numbers) = np_1) \end{aligned} \quad (1)$$

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.

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 k5_numbers) \wedge ((v5_relat_1 \\
& X0 (u1_compos_1 k1_scmf_sa_2)) \wedge ((v1_funct_1 X0) \wedge (v1_partfun1 \\
& X0 k5_numbers)))))) \Rightarrow (\forall X1.((v1_relat_1 X1) \wedge ((v4_relat_1 \\
& X1 (u1_struct_0 k1_scmf_sa_2)) \wedge ((v1_funct_1 X1) \wedge ((v5_funct_1 \\
& X1 (k2_memstr_0 np_3 k1_scmf_sa_2)) \wedge (v1_partfun1 X1 (u1_struct_0 \\
& k1_scmf_sa_2)))))) \Rightarrow (\forall X2.((\neg v1_xboole_0 X2) \wedge ((v1_relat_1 \\
& X2) \wedge ((v4_relat_1 X2 k5_numbers) \wedge ((v5_relat_1 X2 (u1_compos_1 \\
& k1_scmf_sa_2)) \wedge ((v1_funct_1 X2) \wedge ((v1_finset_1 X2) \wedge (v1_afinsq_1 \\
& X2)))))) \Rightarrow ((r2_scm_halt X2 X1 X0) \Leftrightarrow (r6_scmf_sa7b X2 (k1_scmf_sa_m \\
& X1) X0)))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 k5_numbers) \wedge ((v5_relat_1 \\
& X0 (u1_compos_1 k1_scmf_sa_2)) \wedge ((v1_funct_1 X0) \wedge (v1_partfun1 \\
& X0 k5_numbers)))))) \Rightarrow (\forall X1.((v1_relat_1 X1) \wedge ((v4_relat_1 \\
& X1 (u1_struct_0 k1_scmf_sa_2)) \wedge ((v1_funct_1 X1) \wedge ((v5_funct_1 \\
& X1 (k2_memstr_0 np_3 k1_scmf_sa_2)) \wedge (v1_partfun1 X1 (u1_struct_0 \\
& k1_scmf_sa_2)))))) \Rightarrow (\forall X2.((v1_ami_2 X2) \wedge ((\neg v1_scmf_sa_m \\
& X2) \wedge (m1_subset_1 X2 (u1_struct_0 k1_scmf_sa_2)))))) \Rightarrow (\forall X3. \\
& ((\neg v1_xboole_0 X3) \wedge ((v1_relat_1 X3) \wedge ((v4_relat_1 X3 k5_numbers) \wedge \\
& ((v5_relat_1 X3 (u1_compos_1 k1_scmf_sa_2)) \wedge ((v1_funct_1 X3) \wedge \\
& ((v1_finset_1 X3) \wedge (v1_afinsq_1 X3)))))) \Rightarrow (((r5_scmf_sa7b X3 \\
& X1 X0) \wedge (r6_scmf_sa7b X3 X1 X0)) \Rightarrow ((r1_xxreal_0 (k1_funct_1 X1 X2) \\
& k6_numbers) \vee (k6_memstr_0 np_3 k1_scmf_sa_2 (k5_extpro_1 np_3 \\
& k1_scmf_sa_2 (k1_funct_4 X0 (k2_scmf_sa_9 X2 X3)) (k8_memstr_0 np_3 \\
& k1_scmf_sa_2 X1) (k2_nat_1 (k8_extpro_1 np_3 k1_scmf_sa_2 (k1_funct_4 \\
& X0 X3) (k8_memstr_0 np_3 k1_scmf_sa_2 X1)) np_3)) = k6_memstr_0 \\
& np_3 k1_scmf_sa_2 (k5_extpro_1 np_3 k1_scmf_sa_2 (k1_funct_4 \\
& X0 X3) (k8_memstr_0 np_3 k1_scmf_sa_2 X1) (k8_extpro_1 np_3 k1_scmf_sa_2 \\
& (k1_funct_4 X0 X3) (k8_memstr_0 np_3 k1_scmf_sa_2 X1))))))
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 k5_numbers) \wedge ((v5_relat_1 \\
& X0 (u1_compos_1 k1_scmf_sa_2)) \wedge ((v1_funct_1 X0) \wedge (v1_partfun1 \\
& X0 k5_numbers)))))) \Rightarrow (\forall X1.((v1_relat_1 X1) \wedge ((v4_relat_1 \\
& X1 (u1_struct_0 k1_scmf_sa_2)) \wedge ((v1_funct_1 X1) \wedge ((v5_funct_1 \\
& X1 (k2_memstr_0 np_3 k1_scmf_sa_2)) \wedge (v1_partfun1 X1 (u1_struct_0 \\
& k1_scmf_sa_2)))))) \Rightarrow (\forall X2.((\neg v1_xboole_0 X2) \wedge ((v1_relat_1 \\
& X2) \wedge ((v4_relat_1 X2 k5_numbers) \wedge ((v5_relat_1 X2 (u1_compos_1 \\
& k1_scmf_sa_2)) \wedge ((v1_funct_1 X2) \wedge ((v1_finset_1 X2) \wedge (v1_afinsq_1 \\
& X2)))))) \Rightarrow ((r1_scm_halt X2 X1 X0) \Leftrightarrow (r5_scmf_sa7b X2 (k1_scmf_sa_m \\
& X1) X0)))
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned} & \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 (u1_struct_0 k1_scmf_sa_2)) \wedge \\ & ((v1_funct_1 X0) \wedge ((v5_funct_1 X0 (k2_memstr_0 np_3 k1_scmf_sa_2)) \wedge \\ & (v1_partfun1 X0 (u1_struct_0 k1_scmf_sa_2)))))) \Rightarrow ((k1_funct_1 \\ & X0 (k4_scmf_sa_2 k6_numbers) = np_1) \Rightarrow (k8_memstr_0 np_3 k1_scmf_sa_2 \\ & X0 = k1_scmf_sa_m X0)) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 k5_numbers) \wedge ((v5_relat_1 \\ & X0 (u1_compos_1 k1_scmf_sa_2)) \wedge ((v1_funct_1 X0) \wedge (v1_partfun1 \\ & X0 k5_numbers)))))) \Rightarrow (\forall X1.((v1_relat_1 X1) \wedge ((v4_relat_1 \\ & X1 (u1_struct_0 k1_scmf_sa_2)) \wedge ((v1_funct_1 X1) \wedge ((v5_funct_1 \\ & X1 (k2_memstr_0 np_3 k1_scmf_sa_2)) \wedge (v1_partfun1 X1 (u1_struct_0 \\ & k1_scmf_sa_2)))))) \Rightarrow (\forall X2.((\neg v1_xboole_0 X2) \wedge ((v1_relat_1 \\ & X2) \wedge ((v4_relat_1 X2 k5_numbers) \wedge ((v5_relat_1 X2 (u1_compos_1 \\ & k1_scmf_sa_2)) \wedge ((v1_funct_1 X2) \wedge ((v1_finset_1 X2) \wedge (v1_afinsq_1 \\ & X2)))))) \Rightarrow (\forall X3.((v1_ami_2 X3) \wedge ((\neg v1_scmf_sa_m X3) \wedge (m1_subset_1 \\ & X3 (u1_struct_0 k1_scmf_sa_2)))) \Rightarrow (((r1_scm_halt X2 X1 X0) \wedge (r2_scm_halt \\ & X2 X1 X0)) \Rightarrow ((r1_xxreal_0 (k1_funct_1 X1 X3) k6_numbers) \vee ((k5_memstr_0 \\ & np_3 k1_scmf_sa_2 (k5_extpro_1 np_3 k1_scmf_sa_2 (k1_funct_4 \\ & X0 (k2_scmf_sa_9 X3 X2)) (k1_scmf_sa_m X1) (k2_nat_1 (k8_extpro_1 \\ & np_3 k1_scmf_sa_2 (k1_funct_4 X0 X2) (k1_scmf_sa_m X1)) np_3)) = \\ & k6_numbers) \wedge (\forall X4.(m2_subset_1 X4 k1_numbers k5_numbers) \Rightarrow \\ & ((r1_xxreal_0 X4 (k2_nat_1 (k8_extpro_1 np_3 k1_scmf_sa_2 (k1_funct_4 \\ & X0 X2) (k1_scmf_sa_m X1)) np_3)) \Rightarrow (k5_memstr_0 np_3 k1_scmf_sa_2 \\ & (k5_extpro_1 np_3 k1_scmf_sa_2 (k1_funct_4 X0 (k2_scmf_sa_9 X3 \\ & X2)) (k1_scmf_sa_m X1) X4) \in k9_xtuple_0 (k2_scmf_sa_9 X3 X2))))))))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 (u1_struct_0 k1_scmf_sa_2)) \wedge \\ & ((v1_funct_1 X0) \wedge ((v5_funct_1 X0 (k2_memstr_0 np_3 k1_scmf_sa_2)))))) \Rightarrow \\ & (k1_scmf_sa_m (k1_scmf_sa_m X0) = k1_scmf_sa_m X0) \end{aligned} \quad (8)$$

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.

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 (u1_struct_0 k1_scmfsa_2)) \wedge \\
& ((v1_funct_1 X0) \wedge (v5_funct_1 X0 (k2_memstr_0 np_3 k1_scmfsa_2)))))) \Rightarrow \\
& ((v1_relat_1 (k1_scmfsa_m X0)) \wedge ((v4_relat_1 (k1_scmfsa_m X0) \\
& (u1_struct_0 k1_scmfsa_2)) \wedge ((v1_funct_1 (k1_scmfsa_m X0)) \wedge \\
& (v5_funct_1 (k1_scmfsa_m X0) (k2_memstr_0 np_3 k1_scmfsa_2)))))) \\
& \tag{10}
\end{aligned}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 k5_numbers) \wedge ((v5_relat_1 \\
& X0 (u1_compos_1 k1_scmfsa_2)) \wedge ((v1_funct_1 X0) \wedge (v1_partfun1 \\
& X0 k5_numbers)))))) \Rightarrow (\forall X1.((v1_relat_1 X1) \wedge ((v4_relat_1 \\
& X1 (u1_struct_0 k1_scmfsa_2)) \wedge ((v1_funct_1 X1) \wedge ((v5_funct_1 \\
& X1 (k2_memstr_0 np_3 k1_scmfsa_2)) \wedge (v1_partfun1 X1 (u1_struct_0 \\
& k1_scmfsa_2)))))) \Rightarrow (\forall X2.((\neg v1_xboole_0 X2) \wedge ((v1_relat_1 \\
& X2) \wedge ((v4_relat_1 X2 k5_numbers) \wedge ((v5_relat_1 X2 (u1_compos_1 \\
& k1_scmfsa_2)) \wedge ((v1_funct_1 X2) \wedge ((v1_finset_1 X2) \wedge (v1_afinsq_1 \\
& X2)))))) \Rightarrow (\forall X3.((v1_ami_2 X3) \wedge ((\neg v1_scmfsa_m X3) \wedge (m1_subset_1 \\
& X3 (u1_struct_0 k1_scmfsa_2)))))) \Rightarrow (((r1_scm_halt X2 X1 X0) \wedge (r2_scm_halt \\
& X2 X1 X0)) \Rightarrow ((r1_xxreal_0 (k1_funct_1 X1 X3) k6_numbers) \vee ((k5_memstr_0 \\
& np_3 k1_scmfsa_2 (k5_extpro_1 np_3 k1_scmfsa_2 (k1_funct_4 \\
& X0 (k2_scmfsa_9 X3 X2)) (k1_scmfsa_m X1) (k2_nat_1 (k8_extpro_1 \\
& np_3 k1_scmfsa_2 (k1_funct_4 X0 X2) (k1_scmfsa_m X1)) np_3)) = \\
& k6_numbers) \wedge (k6_memstr_0 np_3 k1_scmfsa_2 (k5_extpro_1 np_3 \\
& k1_scmfsa_2 (k1_funct_4 X0 (k2_scmfsa_9 X3 X2)) (k1_scmfsa_m X1) \\
& (k2_nat_1 (k8_extpro_1 np_3 k1_scmfsa_2 (k1_funct_4 X0 X2) (k1_scmfsa_m \\
& X1)) np_3)) = k6_memstr_0 np_3 k1_scmfsa_2 (k5_extpro_1 np_3 \\
& k1_scmfsa_2 (k1_funct_4 X0 X2) (k1_scmfsa_m X1) (k8_extpro_1 np_3 \\
& k1_scmfsa_2 (k1_funct_4 X0 X2) (k1_scmfsa_m X1)))))))))
\end{aligned}$$