# t39_osafree (TMbPszTGqtNVYn-LXVKAwmZrGdekgrVL26ZM)

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Let $v2\_struct\_0 : \iota \Rightarrow o$ be given. Let $v11\_struct\_0 : \iota \Rightarrow o$ be given. Let $v4\_osalg\_1 : \iota \Rightarrow o$ be given. Let $v5\_osalg\_1 : \iota \Rightarrow o$ be given. Let $v2\_osalg\_4 : \iota \Rightarrow o$ be given. Let $l3\_osalg\_1 : \iota \Rightarrow o$ be given. Let $v1\_relat\_1 : \iota \Rightarrow o$ be given. Let $v2\_relat\_1 : \iota \Rightarrow o$ be given. Let $v4\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1\_struct\_0 : \iota \Rightarrow \iota$ be given. Let $v1\_funct\_1 : \iota \Rightarrow o$ be given. Let $v1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v2\_osafree : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k16\_osafree : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1\_osafree : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k24\_osafree : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1\_osafree : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v4\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v12\_osalg\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v13\_osalg\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0) \wedge ((\neg v11\_struct\_0\ X0) \wedge ((v4\_osalg\_1\ X0) \wedge ((v5\_osalg\_1\ X0) \wedge ((v2\_osalg\_4\ X0) \wedge (l3\_osalg\_1\ X0)))))) \Rightarrow (\forall X1.((v1\_relat\_1\ X1) \wedge ((v2\_relat\_1\ X1) \wedge ((v4\_relat\_1\ X1\ (u1\_struct\_0\ X0)) \wedge ((v1\_funct\_1\ X1) \wedge (v1\_partfun1\ X1\ (u1\_struct\_0\ X0)))))) \Rightarrow (v1\_osafree\ (k24\_osafree\ X0\ X1)\ X0\ (k16\_osafree\ X0\ X1))) \tag{1}$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2\_struct\_0\ X0) \wedge ((\neg v11\_struct\_0\ X0) \wedge ((v4\_osalg\_1\ X0) \wedge ((v5\_osalg\_1\ X0) \wedge ((v2\_osalg\_4\ X0) \wedge (l3\_osalg\_1\ X0)))))) \wedge ((v1\_relat\_1\ X1) \wedge ((v2\_relat\_1\ X1) \wedge ((v4\_relat\_1\ X1\ (u1\_struct\_0\ X0)) \wedge ((v1\_funct\_1\ X1) \wedge (v1\_partfun1\ X1\ (u1\_struct\_0\ X0))))))) \Rightarrow (m1\_osafree\ (k24\_osafree\ X0\ X1)\ X0\ (k16\_osafree\ X0\ X1)) \tag{2}$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v4\_osalg\_1\ X0)\wedge((v5\_osalg\_1\ X0)\wedge((v2\_osalg\_4\ X0)\wedge(l3\_osalg\_1\ X0))))))\wedge((v1\_relat\_1\ X1)\wedge((v2\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ (u1\_struct\_0\ X0))\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ (u1\_struct\_0\ X0)))))))\Rightarrow((v3\_msualg\_1\ (k16\_osafree\ X0\ X1)\ X0)\wedge((v4\_msualg\_1\ (k16\_osafree\ X0\ X1)\ X0)\wedge((v12\_osalg\_1\ (k16\_osafree\ X0\ X1)\ X0)\wedge((v13\_osalg\_1\ (k16\_osafree\ X0\ X1)\ X0)\wedge(l3\_msualg\_1\ (k16\_osafree\ X0\ X1)\ X0))))) \tag{3}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v4\_osalg\_1\ X0)\wedge((v5\_osalg\_1\ X0)\wedge(l3\_osalg\_1\ X0)))))\Rightarrow(\forall X1.((v12\_osalg\_1\ X1\ X0)\wedge((v13\_osalg\_1\ X1\ X0)\wedge(l3\_msualg\_1\ X1\ X0)))\Rightarrow((v2\_osafree\ X1\ X0)\Leftrightarrow(\exists X2.(m1\_osafree\ X2\ X0\ X1)\wedge(v1\_osafree\ X2\ X0\ X1)))) \tag{4}$$

**Theorem 1**

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v4\_osalg\_1\ X0)\wedge((v5\_osalg\_1\ X0)\wedge((v2\_osalg\_4\ X0)\wedge(l3\_osalg\_1\ X0))))))\Rightarrow(\forall X1.((v1\_relat\_1\ X1)\wedge((v2\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ (u1\_struct\_0\ X0))\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ (u1\_struct\_0\ X0)))))))\Rightarrow(v2\_osafree\ (k16\_osafree\ X0\ X1)\ X0))$$