

thm_2Erich__list_2ESEG__compute
(TMPqG87fdmkjZbBrU4huVDNese5TSvdhgYw)

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Let $c_2Enum_2EZERO_REP : \iota$ be given. Assume the following.

$$c_2Enum_2EZERO_REP \in \omega \tag{1}$$

Let $ty_2Enum_2Enum : \iota$ be given. Assume the following.

$$nonempty\ ty_2Enum_2Enum \tag{2}$$

Let $c_2Enum_2EABS_num : \iota$ be given. Assume the following.

$$c_2Enum_2EABS_num \in (ty_2Enum_2Enum^{\omega}) \tag{3}$$

Definition 1 We define c_2Emin_2E3D to be $\lambda A.\lambda x \in A.\lambda y \in A.inj_o (x = y)$ of type $\iota \Rightarrow \iota$.

Definition 2 We define c_2Enum_2E0 to be $(ap\ c_2Enum_2EABS_num\ c_2Enum_2EZERO_REP)$.

Let $c_2Enum_2EREP_num : \iota$ be given. Assume the following.

$$c_2Enum_2EREP_num \in (\omega^{ty_2Enum_2Enum}) \tag{4}$$

Let $c_2Enum_2ESUC_REP : \iota$ be given. Assume the following.

$$c_2Enum_2ESUC_REP \in (\omega^{\omega}) \tag{5}$$

Definition 3 We define c_2Ebool_2ET to be $(ap\ (ap\ (c_2Emin_2E3D\ (2^2))\ (\lambda V0x \in 2.V0x))\ (\lambda V1x \in 2.V1x))$

Definition 4 We define c_2Ebool_2E21 to be $\lambda A.\lambda a : \iota.(\lambda V0P \in (2^{A-27a}).(ap\ (ap\ (c_2Emin_2E3D\ (2^{A-27a}))\ (\lambda V1x \in 2.V1x))\ (\lambda V1x \in 2.V1x))$

Definition 5 We define c_2Enum_2ESUC to be $\lambda V0m \in ty_2Enum_2Enum.(ap\ c_2Enum_2EABS_num\ (c_2Enum_2E0\ m))$

Let $c_2Earithmetic_2E2B : \iota$ be given. Assume the following.

$$c_2Earithmetic_2E2B \in ((ty_2Enum_2Enum^{ty_2Enum_2Enum})^{ty_2Enum_2Enum}) \tag{6}$$

Definition 6 We define $c_2Earithmic_2EBIT2$ to be $\lambda V0n \in ty_2Enum_2Enum.(ap (ap c_2Earithmic_2E_2D$

Definition 7 We define $c_2Earithmic_2EZERO$ to be c_2Enum_2E0 .

Let $c_2Earithmic_2E_2D : \iota$ be given. Assume the following.

$$c_2Earithmic_2E_2D \in ((ty_2Enum_2Enum^{ty_2Enum_2Enum})^{ty_2Enum_2Enum}) \quad (7)$$

Definition 8 We define $c_2Earithmic_2EBIT1$ to be $\lambda V0n \in ty_2Enum_2Enum.(ap (ap c_2Earithmic_2E_2D$

Definition 9 We define $c_2Earithmic_2ENUMERAL$ to be $\lambda V0x \in ty_2Enum_2Enum.V0x$.

Definition 10 We define $c_2Emin_2E_3D_3D_3E$ to be $\lambda P \in 2.\lambda Q \in 2.inj_o (p P \Rightarrow p Q)$ of type ι .

Let $ty_2Elist_2Elist : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A0.nonempty A0 \Rightarrow nonempty (ty_2Elist_2Elist A0) \quad (8)$$

Let $c_2Elist_2ECONS : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A.27a.nonempty A.27a \Rightarrow c_2Elist_2ECONS A.27a \in (((ty_2Elist_2Elist A.27a)^{(ty_2Elist_2Elist A.27a)})^{A.27a}) \quad (9)$$

Let $c_2Elist_2ENIL : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A.27a.nonempty A.27a \Rightarrow c_2Elist_2ENIL A.27a \in (ty_2Elist_2Elist A.27a) \quad (10)$$

Let $c_2Erich_list_2ESEG : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A.27a.nonempty A.27a \Rightarrow c_2Erich_list_2ESEG A.27a \in (((ty_2Elist_2Elist A.27a)^{(ty_2Elist_2Elist A.27a)})^{ty_2Enum_2Enum})^{ty_2Enum_2Enum} \quad (11)$$

Definition 11 We define $c_2Ebool_2E_2F_5C$ to be $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap (c_2Ebool_2E_21 2) (\lambda V2t \in$

Assume the following.

$$\begin{aligned} & \forall A.27a.nonempty A.27a \Rightarrow (\forall V0f \in ((A.27a^{ty_2Enum_2Enum})^{ty_2Enum_2Enum}). \\ & \quad (\forall V1g \in (A.27a^{ty_2Enum_2Enum}).((\forall V2n \in ty_2Enum_2Enum. \\ & \quad ((ap V1g (ap c_2Enum_2ESUC V2n)) = (ap (ap V0f V2n) (ap c_2Enum_2ESUC V2n)))) \Leftrightarrow ((\forall V3n \in ty_2Enum_2Enum.((ap V1g (ap c_2Earithmic_2ENUMERAL \\ & \quad (ap c_2Earithmic_2EBIT1 V3n))) = (ap (ap V0f (ap (ap c_2Earithmic_2E_2D \\ & \quad (ap c_2Earithmic_2ENUMERAL (ap c_2Earithmic_2EBIT1 V3n))) \\ & \quad (ap c_2Earithmic_2ENUMERAL (ap c_2Earithmic_2EBIT1 c_2Earithmic_2EZERO)))))) \\ & \quad (ap c_2Earithmic_2ENUMERAL (ap c_2Earithmic_2EBIT1 V3n)))))) \wedge \\ & \quad (\forall V4n \in ty_2Enum_2Enum.((ap V1g (ap c_2Earithmic_2ENUMERAL \\ & \quad (ap c_2Earithmic_2EBIT2 V4n))) = (ap (ap V0f (ap c_2Earithmic_2ENUMERAL \\ & \quad (ap c_2Earithmic_2EBIT1 V4n))) (ap c_2Earithmic_2ENUMERAL \\ & \quad (ap c_2Earithmic_2EBIT2 V4n))))))))) \quad (12) \end{aligned}$$

Assume the following.

$$(\forall V0t1 \in 2. (\forall V1t2 \in 2. ((p V0t1) \Rightarrow (p V1t2)) \Rightarrow (((p V1t2) \Rightarrow (p V0t1)) \Rightarrow ((p V0t1) \Leftrightarrow (p V1t2)))))) \quad (13)$$

Assume the following.

$$(\forall V0t1 \in 2. (\forall V1t2 \in 2. (\forall V2t3 \in 2. (((p V0t1) \wedge ((p V1t2) \wedge (p V2t3))) \Leftrightarrow (((p V0t1) \wedge (p V1t2)) \wedge (p V2t3)))))) \quad (14)$$

Assume the following.

$$\forall A.27a.nonempty A.27a \Rightarrow (\forall V0x \in A.27a. (\forall V1y \in A.27a. ((V0x = V1y) \Leftrightarrow (V1y = V0x)))) \quad (15)$$

Assume the following.

$$\begin{aligned} & \forall A.27a.nonempty A.27a \Rightarrow ((\forall V0k \in ty_2Enum_2Enum. \\ & (\forall V1l \in (ty_2Elist_2Elist A.27a). ((ap (ap (ap (c_2Erich_list_2ESEG \\ & A.27a) c_2Enum_2E0) V0k) V1l) = (c_2Elist_2ENIL A.27a)))) \wedge ((\forall V2m \in \\ & ty_2Enum_2Enum. (\forall V3x \in A.27a. (\forall V4l \in (ty_2Elist_2Elist \\ & A.27a). ((ap (ap (ap (c_2Erich_list_2ESEG A.27a) (ap c_2Enum_2ESUC \\ & V2m)) c_2Enum_2E0) (ap (ap (c_2Elist_2ECONS A.27a) V3x) V4l)) = \\ & (ap (ap (c_2Elist_2ECONS A.27a) V3x) (ap (ap (ap (c_2Erich_list_2ESEG \\ & A.27a) V2m) c_2Enum_2E0) V4l)))))) \wedge (\forall V5m \in ty_2Enum_2Enum. \\ & (\forall V6k \in ty_2Enum_2Enum. (\forall V7x \in A.27a. (\forall V8l \in \\ & (ty_2Elist_2Elist A.27a). ((ap (ap (ap (c_2Erich_list_2ESEG \\ & A.27a) (ap c_2Enum_2ESUC V5m)) (ap c_2Enum_2ESUC V6k)) (ap (ap (\\ & c_2Elist_2ECONS A.27a) V7x) V8l)) = (ap (ap (ap (c_2Erich_list_2ESEG \\ & A.27a) (ap c_2Enum_2ESUC V5m)) V6k) V8l))))))))) \quad (16) \end{aligned}$$

Theorem 1

$$\begin{aligned}
& \forall A_{.27a}. \text{nonempty } A_{.27a} \Rightarrow ((\forall V0k \in \text{ty_2Enum_2Enum}. \\
& (\forall V1l \in (\text{ty_2Elist_2Elist } A_{.27a}). ((\text{ap } (\text{ap } (\text{ap } (\text{c_2Erich_list_2ESEG} \\
& A_{.27a}) \text{ c_2Enum_2E0}) V0k) V1l) = (\text{c_2Elist_2ENIL } A_{.27a})))) \wedge ((\forall V2m \in \\
& \text{ty_2Enum_2Enum}. (\forall V3x \in A_{.27a}. (\forall V4l \in (\text{ty_2Elist_2Elist} \\
& A_{.27a}). ((\text{ap } (\text{ap } (\text{ap } (\text{c_2Erich_list_2ESEG } A_{.27a}) (\text{ap } \text{c_2Earithmetic_2ENUMERAL} \\
& (\text{ap } \text{c_2Earithmetic_2EBIT1 } V2m))) \text{ c_2Enum_2E0}) (\text{ap } (\text{ap } (\text{c_2Elist_2ECONS} \\
& A_{.27a}) V3x) V4l)) = (\text{ap } (\text{ap } (\text{c_2Elist_2ECONS } A_{.27a}) V3x) (\text{ap } (\text{ap } (\\
& \text{ap } (\text{c_2Erich_list_2ESEG } A_{.27a}) (\text{ap } (\text{ap } \text{c_2Earithmetic_2E_2D} \\
& (\text{ap } \text{c_2Earithmetic_2ENUMERAL } (\text{ap } \text{c_2Earithmetic_2EBIT1 } V2m)))) \\
& (\text{ap } \text{c_2Earithmetic_2ENUMERAL } (\text{ap } \text{c_2Earithmetic_2EBIT1 } \text{c_2Earithmetic_2EZERO})))) \\
& \text{c_2Enum_2E0}) V4l)))))) \wedge ((\forall V5m \in \text{ty_2Enum_2Enum}. (\forall V6x \in \\
& A_{.27a}. (\forall V7l \in (\text{ty_2Elist_2Elist } A_{.27a}). ((\text{ap } (\text{ap } (\text{ap } (\text{c_2Erich_list_2ESEG} \\
& A_{.27a}) (\text{ap } \text{c_2Earithmetic_2ENUMERAL } (\text{ap } \text{c_2Earithmetic_2EBIT2} \\
& V5m))) \text{ c_2Enum_2E0}) (\text{ap } (\text{ap } (\text{c_2Elist_2ECONS } A_{.27a}) V6x) V7l)) = \\
& (\text{ap } (\text{ap } (\text{c_2Elist_2ECONS } A_{.27a}) V6x) (\text{ap } (\text{ap } (\text{ap } (\text{c_2Erich_list_2ESEG} \\
& A_{.27a}) (\text{ap } \text{c_2Earithmetic_2ENUMERAL } (\text{ap } \text{c_2Earithmetic_2EBIT1} \\
& V5m))) \text{ c_2Enum_2E0}) V7l)))))) \wedge ((\forall V8m \in \text{ty_2Enum_2Enum}. \\
& (\forall V9k \in \text{ty_2Enum_2Enum}. (\forall V10x \in A_{.27a}. (\forall V11l \in \\
& (\text{ty_2Elist_2Elist } A_{.27a}). ((\text{ap } (\text{ap } (\text{ap } (\text{c_2Erich_list_2ESEG} \\
& A_{.27a}) (\text{ap } \text{c_2Earithmetic_2ENUMERAL } (\text{ap } \text{c_2Earithmetic_2EBIT1} \\
& V8m))) (\text{ap } \text{c_2Earithmetic_2ENUMERAL } (\text{ap } \text{c_2Earithmetic_2EBIT1} \\
& V9k))) (\text{ap } (\text{ap } (\text{c_2Elist_2ECONS } A_{.27a}) V10x) V11l)) = (\text{ap } (\text{ap } (\text{ap } \\
& (\text{c_2Erich_list_2ESEG } A_{.27a}) (\text{ap } \text{c_2Earithmetic_2ENUMERAL } (\\
& \text{ap } \text{c_2Earithmetic_2EBIT1 } V8m))) (\text{ap } (\text{ap } \text{c_2Earithmetic_2E_2D} \\
& (\text{ap } \text{c_2Earithmetic_2ENUMERAL } (\text{ap } \text{c_2Earithmetic_2EBIT1 } V9k)))) \\
& (\text{ap } \text{c_2Earithmetic_2ENUMERAL } (\text{ap } \text{c_2Earithmetic_2EBIT1 } \text{c_2Earithmetic_2EZERO})))) \\
& V11l)))))) \wedge ((\forall V12m \in \text{ty_2Enum_2Enum}. (\forall V13k \in \text{ty_2Enum_2Enum}. \\
& (\forall V14x \in A_{.27a}. (\forall V15l \in (\text{ty_2Elist_2Elist } A_{.27a}). \\
& ((\text{ap } (\text{ap } (\text{ap } (\text{c_2Erich_list_2ESEG } A_{.27a}) (\text{ap } \text{c_2Earithmetic_2ENUMERAL} \\
& (\text{ap } \text{c_2Earithmetic_2EBIT2 } V12m))) (\text{ap } \text{c_2Earithmetic_2ENUMERAL} \\
& (\text{ap } \text{c_2Earithmetic_2EBIT1 } V13k))) (\text{ap } (\text{ap } (\text{c_2Elist_2ECONS } A_{.27a}) \\
& V14x) V15l)) = (\text{ap } (\text{ap } (\text{ap } (\text{c_2Erich_list_2ESEG } A_{.27a}) (\text{ap } \text{c_2Earithmetic_2ENUMERAL} \\
& (\text{ap } \text{c_2Earithmetic_2EBIT2 } V12m))) (\text{ap } (\text{ap } \text{c_2Earithmetic_2E_2D} \\
& (\text{ap } \text{c_2Earithmetic_2ENUMERAL } (\text{ap } \text{c_2Earithmetic_2EBIT1 } V13k))) \\
& (\text{ap } \text{c_2Earithmetic_2ENUMERAL } (\text{ap } \text{c_2Earithmetic_2EBIT1 } \text{c_2Earithmetic_2EZERO})))) \\
& V15l)))))) \wedge ((\forall V16m \in \text{ty_2Enum_2Enum}. (\forall V17k \in \text{ty_2Enum_2Enum}. \\
& (\forall V18x \in A_{.27a}. (\forall V19l \in (\text{ty_2Elist_2Elist } A_{.27a}). \\
& ((\text{ap } (\text{ap } (\text{ap } (\text{c_2Erich_list_2ESEG } A_{.27a}) (\text{ap } \text{c_2Earithmetic_2ENUMERAL} \\
& (\text{ap } \text{c_2Earithmetic_2EBIT1 } V16m))) (\text{ap } \text{c_2Earithmetic_2ENUMERAL} \\
& (\text{ap } \text{c_2Earithmetic_2EBIT2 } V17k))) (\text{ap } (\text{ap } (\text{c_2Elist_2ECONS } A_{.27a}) \\
& V18x) V19l)) = (\text{ap } (\text{ap } (\text{ap } (\text{c_2Erich_list_2ESEG } A_{.27a}) (\text{ap } \text{c_2Earithmetic_2ENUMERAL} \\
& (\text{ap } \text{c_2Earithmetic_2EBIT1 } V16m))) (\text{ap } \text{c_2Earithmetic_2ENUMERAL} \\
& (\text{ap } \text{c_2Earithmetic_2EBIT1 } V17k))) V19l)))))) \wedge ((\forall V20m \in \\
& \text{ty_2Enum_2Enum}. (\forall V21k \in \text{ty_2Enum_2Enum}. (\forall V22x \in \\
& A_{.27a}. (\forall V23l \in (\text{ty_2Elist_2Elist } A_{.27a}). ((\text{ap } (\text{ap } (\text{ap } (\text{c_2Erich_list_2ESEG} \\
& A_{.27a}) (\text{ap } \text{c_2Earithmetic_2ENUMERAL } (\text{ap } \text{c_2Earithmetic_2EBIT2} \\
& V20m))) (\text{ap } \text{c_2Earithmetic_2ENUMERAL } (\text{ap } \text{c_2Earithmetic_2EBIT2} \\
& V21k))) (\text{ap } (\text{ap } (\text{c_2Elist_2ECONS } A_{.27a}) V22x) V23l)) = (\text{ap } (\text{ap } (\text{ap } \\
& (\text{c_2Erich_list_2ESEG } A_{.27a}) (\text{ap } \text{c_2Earithmetic_2ENUMERAL } (\\
& \text{ap } \text{c_2Earithmetic_2EBIT2 } V20m))) (\text{ap } \text{c_2Earithmetic_2ENUMERAL} \\
& (\text{ap } \text{c_2Earithmetic_2EBIT1 } V21k))) V23l)))))))))
\end{aligned}$$