

thm_2Erich__list_2EFOLDER__SINGLE
(TMUF9KVASrp8RvhH3QwvRVKV5wg6vNHHT3Y)

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Definition 1 We define $c_2Emin_2E_3D$ 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_2Ebool_2ET to be $(ap (ap (c_2Emin_2E_3D (2^2)) (\lambda V0x \in 2.V0x)) (\lambda V1x \in 2.V1x))$

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

$$\forall A0.nonempty A0 \Rightarrow nonempty (ty_2Elist_2Elist A0) \quad (1)$$

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

$$\forall A.27a.nonempty A.27a \Rightarrow c_2Elist_2ECONS A.27a \in (((ty_2Elist_2Elist A.27a)(ty_2Elist_2Elist A.27a))^{A.27a}) \quad (2)$$

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

$$\forall A.27a.nonempty A.27a \Rightarrow c_2Elist_2ENIL A.27a \in (ty_2Elist_2Elist A.27a) \quad (3)$$

Let $c_2Elist_2EFOLDER : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A.27a.nonempty A.27a \Rightarrow \forall A.27b.nonempty A.27b \Rightarrow c_2Elist_2EFOLDER A.27a A.27b \in (((A.27b)(ty_2Elist_2Elist A.27a))^{A.27b})^{((A.27b)^{A.27a})^{A.27a}} \quad (4)$$

Definition 3 We define $c_2Ebool_2E_21$ to be $\lambda A.27a : \iota.(\lambda V0P \in (2^{A.27a}).(ap (ap (c_2Emin_2E_3D (2^{A.27a}))$

Definition 4 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 .

Definition 5 We define $c_2Ebool_2E_2F_5C$ to be $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap (c_2Ebool_2E_21 2) (\lambda V2t \in 2.V2t))$

Assume the following.

$$True \quad (5)$$

Assume the following.

$$\forall A_27a.nonempty\ A_27a \Rightarrow (\forall V0t \in 2. ((\forall V1x \in A_27a.(p\ V0t)) \Leftrightarrow (p\ V0t))) \quad (6)$$

Assume the following.

$$\forall A_27a.nonempty\ A_27a \Rightarrow (\forall V0x \in A_27a. ((V0x = V0x) \Leftrightarrow True)) \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall A_27a.nonempty\ A_27a \Rightarrow \forall A_27b.nonempty\ A_27b \Rightarrow (\\ & \quad (\forall V0f \in ((A_27b^{A_27b})^{A_27a}). (\forall V1e \in A_27b. ((ap\ (\\ & \quad ap\ (ap\ (c_2Elist_2EFOLDR\ A_27a\ A_27b)\ V0f)\ V1e)\ (c_2Elist_2ENIL \\ & \quad A_27a)) = V1e))) \wedge (\forall V2f \in ((A_27b^{A_27b})^{A_27a}). (\forall V3e \in \\ & \quad A_27b. (\forall V4x \in A_27a. (\forall V5l \in (ty_2Elist_2Elist\ A_27a). \\ & \quad ((ap\ (ap\ (ap\ (c_2Elist_2EFOLDR\ A_27a\ A_27b)\ V2f)\ V3e)\ (ap\ (ap\ (c_2Elist_2ECONS \\ & \quad A_27a)\ V4x)\ V5l)) = (ap\ (ap\ V2f\ V4x)\ (ap\ (ap\ (ap\ (c_2Elist_2EFOLDR \\ & \quad A_27a\ A_27b)\ V2f)\ V3e)\ V5l)))))))))) \quad (8) \end{aligned}$$

Theorem 1

$$\begin{aligned} & \forall A_27a.nonempty\ A_27a \Rightarrow \forall A_27b.nonempty\ A_27b \Rightarrow (\\ & \quad \forall V0f \in ((A_27b^{A_27b})^{A_27a}). (\forall V1e \in A_27b. (\forall V2x \in \\ & \quad A_27a. ((ap\ (ap\ (ap\ (c_2Elist_2EFOLDR\ A_27a\ A_27b)\ V0f)\ V1e)\ (ap \\ & \quad (ap\ (c_2Elist_2ECONS\ A_27a)\ V2x)\ (c_2Elist_2ENIL\ A_27a))) = (ap \\ & \quad (ap\ V0f\ V2x)\ V1e)))))) \end{aligned}$$