

thm_2Eutil__prob_2EMINIMAL__EXISTS
(TMYpZQz23EY5dmdHkdLTMbmPWDaW9Skn1bm)

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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 $(ap (ap (c_2Emin_2E_3D (2^2)) (\lambda V0x \in 2.V0x)) (\lambda V1x \in 2.V1x))$

Definition 3 We define $c_2Emin_2E_40$ to be $\lambda A.\lambda P \in 2^A.if (\exists x \in A.p (ap P x))$ then (the $(\lambda x.x \in A \wedge p)$ of type $\iota \Rightarrow \iota$.

Definition 4 We define $c_2Ebool_2E_21$ to be $\lambda A.\lambda a : \iota.(\lambda V0P \in (2^{A-27a}).(ap (ap (c_2Emin_2E_3D (2^{A-27a}))$

Definition 5 We define c_2Ebool_2EF to be $(ap (c_2Ebool_2E_21 2) (\lambda V0t \in 2.V0t))$.

Definition 6 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 7 We define $c_2Ebool_2E_7E$ to be $(\lambda V0t \in 2.(ap (ap c_2Emin_2E_3D_3D_3E V0t) c_2Ebool_2EF$

Definition 8 We define $c_2Ebool_2E_2F_5C$ to be $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap (c_2Ebool_2E_21 2) (\lambda V2t \in 2.V2t))$

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

$$nonempty\ ty_2Enum_2Enum \tag{1}$$

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

$$c_2Enum_2EREP_num \in (omega^{ty_2Enum_2Enum}) \tag{2}$$

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

$$c_2Enum_2ESUC_REP \in (omega^{omega}) \tag{3}$$

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

$$c_2Enum_2EABS_num \in (ty_2Enum_2Enum^{omega}) \tag{4}$$

Definition 9 We define c_2Enum_2ESUC to be $\lambda V0m \in ty_2Enum_2Enum.(ap c_2Enum_2EABS_num ($

Definition 10 We define $c_2Ebool_2E_3F$ to be $\lambda A_27a : \iota. (\lambda V0P \in (2^{A_27a}). (ap\ V0P\ (ap\ (c_2Emin_2E_40\ ty_2Enum_2Enum\ V0P))))$

Definition 11 We define $c_2Eprim_rec_2E_3C$ to be $\lambda V0m \in ty_2Enum_2Enum. \lambda V1n \in ty_2Enum_2Enum. (ap\ (c_2Eprim_rec_2E_3C\ V0m\ V1n))$

Definition 12 We define $c_2Eutil_prob_2Eminimal$ to be $\lambda V0p \in (2^{ty_2Enum_2Enum}). (ap\ (c_2Emin_2E_40\ ty_2Enum_2Enum\ V0p))$

Assume the following.

$$True \tag{5}$$

Assume the following.

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

Assume the following.

$$\forall A_27a.nonempty\ A_27a \Rightarrow (\forall V0x \in A_27a. ((V0x = V0x) \Leftrightarrow True)) \tag{7}$$

Assume the following.

$$\forall A_27a.nonempty\ A_27a \Rightarrow (\forall V0x \in A_27a. (\forall V1y \in A_27a. ((V0x = V1y) \Leftrightarrow (V1y = V0x)))) \tag{8}$$

Assume the following.

$$\begin{aligned} & (\forall V0P \in (2^{ty_2Enum_2Enum}). ((\exists V1n \in ty_2Enum_2Enum. \\ & (p\ (ap\ V0P\ V1n))) \Leftrightarrow (\exists V2n \in ty_2Enum_2Enum. ((p\ (ap\ V0P\ V2n)) \wedge \\ & (\forall V3m \in ty_2Enum_2Enum. ((p\ (ap\ (ap\ c_2Eprim_rec_2E_3C\ V3m)\ V2n)) \Rightarrow (\neg(p\ (ap\ V0P\ V3m)))))))))) \end{aligned} \tag{9}$$

Theorem 1

$$\begin{aligned} & (\forall V0P \in (2^{ty_2Enum_2Enum}). ((\exists V1n \in ty_2Enum_2Enum. \\ & (p\ (ap\ V0P\ V1n))) \Leftrightarrow ((p\ (ap\ V0P\ (ap\ c_2Eutil_prob_2Eminimal\ V0P))) \wedge \\ & (\forall V2n \in ty_2Enum_2Enum. ((p\ (ap\ (ap\ c_2Eprim_rec_2E_3C\ V2n)\ (ap\ c_2Eutil_prob_2Eminimal\ V0P))) \Rightarrow (\neg(p\ (ap\ V0P\ V2n)))))))))) \end{aligned}$$