thm_2EpatternMatches_2EREDUNDANT__ROWS__INFOS__CONJ (TMdJUk3Q5XSiP8BD5krj6eVEXZos2fX8HWg)

October 26, 2020

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* $(ap\ (ap\ (\mathsf{c\_2Emin\_2E\_3D}\ (2^2))\ (\lambda V0x \in 2.V0x))\ (\lambda V1x \in 2.V1$

Definition 3 *We define* c_2Ebool_2E_21 *to be* $\lambda A\_27a : \iota.(\lambda V0P \in (2^{A\_27a}).(ap\ (ap\ (\mathsf{c\_2Emin\_2E\_3D}\ (2^{A\_27}$

Definition 4 *We define* c_2Ebool_2EF *to be* $(ap\ (\mathsf{c\_2Ebool\_2E\_21}\ 2)\ (\lambda V0t \in 2.V0t))$.

Let $ty\_2Elist\_2Elist : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A0.nonempty\ A0 \Rightarrow nonempty\ (ty\_2Elist\_2Elist\ A0) \tag{1}$$

Let $c\_2Elist\_2ENIL : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow c\_2Elist\_2ENIL\ A\_27a \in (ty\_2Elist\_2Elist\ A\_27a) \tag{2}$$

Let $c\_2Elist\_2ECONS : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow c\_2Elist\_2ECONS\ A\_27a \in (((ty\_2Elist\_2Elist\ A\_27a)^{(ty\_2Elist\_2Elist\ A\_27a)})^{A\_27a}) \tag{3}$$

Definition 5 *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 6 *We define* c_2Ebool_2E_2F_5C *to be* $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap\ (\mathsf{c\_2Ebool\_2E\_21}\ 2)\ (\lambda V2t \in 2$

Let $c\_2Elist\_2EMAP2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow \forall A\_27b.nonempty\ A\_27b \Rightarrow \forall A\_27c.\ nonempty\ A\_27c \Rightarrow c\_2Elist\_2EMAP2\ A\_27a\ A\_27b\ A\_27c \in ((((ty\_2Elist\_2Elist\ A\_27a)^{(ty\_2Elist\_2Elist\ A\_27c)})^{(ty\_2Elist\_2Elist\ A\_27b)})^{((A\_27a^{A\_27c})^{A\_27b})}) \tag{4}$$

Definition 7 *We define* c_2EpatternMatches_2EREDUNDANT__ROWS__INFOS__CONJ *to be* $\lambda V0ip1 \in (ty\_2Elist\_2Elist\ 2).\lambda V1ip2 \in (ty\_2Elist\_2Elist\ 2).(ap\ (ap\ (ap\ (c\_2Elist\_2EMAP2\ 2\ 2\ 2)$

Assume the following.

$$True \tag{5}$$

Assume the following.

$$(\forall V0t \in 2.(((True \wedge (p\ V0t)) \Leftrightarrow (p\ V0t)) \wedge ((((p\ V0t) \wedge True) \Leftrightarrow (p\ V0t)) \wedge (((False \wedge (p\ V0t)) \Leftrightarrow False) \wedge ((((p\ V0t) \wedge False) \Leftrightarrow False) \wedge (((p\ V0t) \wedge (p\ V0t)) \Leftrightarrow (p\ V0t))))))) \tag{6}$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0x \in A\_27a.((V0x = V0x) \Leftrightarrow True)) \tag{7}$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow \forall A\_27b.nonempty\ A\_27b \Rightarrow \forall A\_27c.nonempty\ A\_27c \Rightarrow \forall A\_27d.nonempty\ A\_27d \Rightarrow \forall A\_27e.nonempty\ A\_27e \Rightarrow \forall A\_27f.nonempty\ A\_27f \Rightarrow ((\forall V0f \in ((A\_27c^{A\_27b})^{A\_27a}).((ap\ (ap\ (ap\ (c\_2Elist\_2EMAP2\ A\_27c\ A\_27a\ A\_27b)\ V0f)\ (c\_2Elist\_2ENIL\ A\_27a))\ (c\_2Elist\_2ENIL\ A\_27b)) = (c\_2Elist\_2ENIL\ A\_27c))) \wedge (\forall V1f \in ((A\_27f^{A\_27e})^{A\_27d}).(\forall V2h1 \in A\_27d.(\forall V3t1 \in (ty\_2Elist\_2Elist\ A\_27d).(\forall V4h2 \in A\_27e.(\forall V5t2 \in (ty\_2Elist\_2Elist\ A\_27e).((ap\ (ap\ (ap\ (c\_2Elist\_2EMAP2\ A\_27f\ A\_27d\ A\_27e)\ V1f)\ (ap\ (ap\ (c\_2Elist\_2ECONS\ A\_27d)\ V2h1)\ V3t1))\ (ap\ (ap\ (c\_2Elist\_2ECONS\ A\_27e)\ V4h2)\ V5t2)) = (ap\ (ap\ (c\_2Elist\_2ECONS\ A\_27f)\ (ap\ (ap\ V1f\ V2h1)\ V4h2))\ (ap\ (ap\ (ap\ (c\_2Elist\_2EMAP2\ A\_27f\ A\_27d\ A\_27e)\ V1f)\ V3t1)\ V5t2))))))))) \tag{8}$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0a0 \in A\_27a.(\forall V1a1 \in (ty\_2Elist\_2Elist\ A\_27a).(\forall V2a0\_27 \in A\_27a.(\forall V3a1\_27 \in (ty\_2Elist\_2Elist\ A\_27a).(((ap\ (ap\ (c\_2Elist\_2ECONS\ A\_27a)\ V0a0)\ V1a1) = (ap\ (ap\ (c\_2Elist\_2ECONS\ A\_27a)\ V2a0\_27)\ V3a1\_27)) \Leftrightarrow ((V0a0 = V2a0\_27) \wedge (V1a1 = V3a1\_27))))))) \tag{9}$$

Theorem 1

$$(\forall V0i1 \in 2.(\forall V1is1 \in (ty\_2Elist\_2Elist\ 2).(\forall V2i2 \in 2.(\forall V3is2 \in (ty\_2Elist\_2Elist\ 2).(((ap\ (ap\ \mathsf{c\_2EpatternMatches\_2EREDUNDANT\_\_ROWS\_\_INFOS\_\_CONJ}\ (c\_2Elist\_2ENIL\ 2))\ (c\_2Elist\_2ENIL\ 2)) = (c\_2Elist\_2ENIL\ 2)) \wedge ((ap\ (ap\ \mathsf{c\_2EpatternMatches\_2EREDUNDANT\_\_ROWS\_\_INFOS\_\_CONJ}\ (ap\ (ap\ (c\_2Elist\_2ECONS\ 2)\ V0i1)\ V1is1))\ (ap\ (ap\ (c\_2Elist\_2ECONS\ 2)\ V2i2)\ V3is2)) = (ap\ (ap\ (c\_2Elist\_2ECONS\ 2)\ (ap\ (ap\ \mathsf{c\_2Ebool\_2E\_2F\_5C}\ V0i1)\ V2i2))\ (ap\ (ap\ \mathsf{c\_2EpatternMatches\_2EREDUNDANT\_\_ROWS\_\_INFOS\_\_CONJ}\ V1is1)\ V3is2)))))))$$