thm_2EPast__Temporal__Logic_2ESOME__FUTURE__EVENT (TMVh-wVThzsMm11jCxyMEELt76EVyFRRj2EL)

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Let $ty\_2Enum\_2Enum : \iota$ be given. Assume the following.

$$nonempty\ ty\_2Enum\_2Enum \quad (1)$$

Let $c\_2Earithmetic\_2E\_2B : \iota$ be given. Assume the following.

$$c\_2Earithmetic\_2E\_2B \in ((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{ty\_2Enum\_2Enum}) \quad (2)$$

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

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

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

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_7E *to be* $(\lambda V0t \in 2.(ap\ (ap\ c\_2Emin\_2E\_3D\_3D\_3E\ V0t)\ c\_2Ebool\_2EF$

Definition 7 *We define* c_2Ebool_2E_2F_5C *to be* $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap\ (c\_2Ebool\_2E\_21\ 2)\ (\lambda V2t \in 2$

Definition 8 *We define* c_2Emin_2E_40 *to be* $\lambda A.\lambda P \in 2^A.\mathbf{if}\ (\exists x \in A.p\ (ap\ P\ x))\ \mathbf{then}\ (the\ (\lambda x.x \in A \wedge p$ *of type* $\iota \Rightarrow \iota$.

Definition 9 *We define* c_2Ebool_2E_3F *to be* $\lambda A\_27a : \iota.(\lambda V0P \in (2^{A\_27a}).(ap\ V0P\ (ap\ (c\_2Emin\_2E\_40\ A$

Definition 10 *We define* c_2Ebool_2E_5C_2F *to be* $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap\ (c\_2Ebool\_2E\_21\ 2)\ (\lambda V2t \in$

Let $c\_2Enum\_2EREP\_\_num : \iota$ be given. Assume the following.

$$c\_2Enum\_2EREP\_\_num \in (omega^{ty\_2Enum\_2Enum}) \quad (3)$$

Let $c\_2Enum\_2ESUC\_\_REP : \iota$ be given. Assume the following.

$$c\_2Enum\_2ESUC\_\_REP \in (omega^{omega}) \quad (4)$$

Let $c\_2Enum\_2EABS\_\_num : \iota$ be given. Assume the following.

$$c\_2Enum\_2EABS\_\_num \in (ty\_2Enum\_2Enum^{omega}) \quad (5)$$

Definition 11 *We define* c_2Enum_2ESUC *to be* $\lambda V0m \in ty\_2Enum\_2Enum.(ap\ c\_2Enum\_2EABS\_\_num$

Definition 12 *We define* c_2ETemporal__Logic_2EWATCH *to be* $\lambda V0q \in (2^{ty\_2Enum\_2Enum}).\lambda V1b \in (2^{ty\_2E$

Definition 13 *We define* c_2ETemporal__Logic_2ESBEFORE *to be* $\lambda V0a \in (2^{ty\_2Enum\_2Enum}).\lambda V1b \in (2^{ty\_$

Definition 14 *We define* c_2ETemporal__Logic_2EBEFORE *to be* $\lambda V0a \in (2^{ty\_2Enum\_2Enum}).\lambda V1b \in (2^{ty\_2E$

Definition 15 *We define* c_2ETemporal__Logic_2ESUNTIL *to be* $\lambda V0a \in (2^{ty\_2Enum\_2Enum}).\lambda V1b \in (2^{ty\_2E$

Definition 16 *We define* c_2ETemporal__Logic_2EUNTIL *to be* $\lambda V0a \in (2^{ty\_2Enum\_2Enum}).\lambda V1b \in (2^{ty\_2En$

Definition 17 *We define* c_2ETemporal__Logic_2ESWHEN *to be* $\lambda V0a \in (2^{ty\_2Enum\_2Enum}).\lambda V1b \in (2^{ty\_2E$

Definition 18 *We define* c_2ETemporal__Logic_2EWHEN *to be* $\lambda V0a \in (2^{ty\_2Enum\_2Enum}).\lambda V1b \in (2^{ty\_2En$

Definition 19 *We define* c_2ETemporal__Logic_2EEVENTUAL *to be* $\lambda V0P \in (2^{ty\_2Enum\_2Enum}).\lambda V1t0 \in t$

Assume the following.

$$(\forall V0b \in (2^{ty\_2Enum\_2Enum}).(\forall V1t0 \in ty\_2Enum\_2Enum. (((p\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2EEVENTUAL}\ V0b)\ V1t0)) \Leftrightarrow (\forall V2a \in (2^{ty\_2Enum\_2Enum}).((p\ (ap\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2EWHEN}\ V2a)\ V0b)\ V1t0)) \Leftrightarrow (p\ (ap\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2ESWHEN}\ V2a)\ V0b)\ V1t0))))) \land (((p\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2EEVENTUAL}\ V0b)\ V1t0)) \Leftrightarrow (\forall V3a \in (2^{ty\_2Enum\_2Enum}).((p\ (ap\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2EUNTIL}\ V3a)\ V0b)\ V1t0)) \Leftrightarrow (p\ (ap\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2ESUNTIL}\ V3a)\ V0b)\ V1t0))))) \land ((p\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2EEVENTUAL}\ V0b)\ V1t0)) \Leftrightarrow (\forall V4a \in (2^{ty\_2Enum\_2Enum}).((p\ (ap\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2EBEFORE}\ V4a)\ V0b)\ V1t0)) \Leftrightarrow (p\ (ap\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2ESBEFORE}\ V4a)\ V0b)\ V1t0))))))))) \quad (6)$$

Theorem 1

$$(\forall V0b \in (2^{ty\_2Enum\_2Enum}).(\forall V1t0 \in ty\_2Enum\_2Enum. (((p\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2EEVENTUAL}\ V0b)\ V1t0)) \Leftrightarrow (\forall V2a \in (2^{ty\_2Enum\_2Enum}).((p\ (ap\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2EWHEN}\ V2a)\ V0b)\ V1t0)) \Leftrightarrow (p\ (ap\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2ESWHEN}\ V2a)\ V0b)\ V1t0))))) \wedge (((p\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2EEVENTUAL}\ V0b)\ V1t0)) \Leftrightarrow (\forall V3a \in (2^{ty\_2Enum\_2Enum}).((p\ (ap\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2EUNTIL}\ V3a)\ V0b)\ V1t0)) \Leftrightarrow (p\ (ap\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2ESUNTIL}\ V3a)\ V0b)\ V1t0))))) \wedge ((p\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2EEVENTUAL}\ V0b)\ V1t0)) \Leftrightarrow (\forall V4a \in (2^{ty\_2Enum\_2Enum}).((p\ (ap\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2EBEFORE}\ V4a)\ V0b)\ V1t0)) \Leftrightarrow (p\ (ap\ (ap\ (ap\ \mathsf{c\_2ETemporal\_\_Logic\_2ESBEFORE}\ V4a)\ V0b)\ V1t0)))))))))$$