thm_2Enumeral__bit_2ENUMERAL__BIT__MODIFY (TMTLUS4xwGXCgHnsb5TY4fCKhYLwXrdySzy)

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

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* $(ap\ (\mathsf{c\_2Ebool\_2E\_21}\ 2)\ (\lambda V0t \in 2.V0t))$.

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 $c\_2Enum\_2EZERO\_\_REP : \iota$ 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 7 *We define* c_2Enum_2E0 *to be* $(ap\ c\_2Enum\_2EABS\_\_num\ c\_2Enum\_2EZERO\_\_REP)$.

Definition 8 *We define* c_2Earithmetic_2EZERO *to be* c_2Enum_2E0.

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

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

$$c\_2Earithmetic\_2E\_2B \in ((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{ty\_2Enum\_2Enum}) \tag{6}$$

Definition 10 *We define* c_2Earithmetic_2EBIT1 *to be* $\lambda V0n \in ty\_2Enum\_2Enum.(ap\ (ap\ c\_2Earithmetic$

Definition 11 *We define* c_2Earithmetic_2ENUMERAL *to be* $\lambda V0x \in ty\_2Enum\_2Enum.V0x$.

Let $c\_2Enumeral\_\_bit\_2EBIT\_\_MODF : \iota$ be given. Assume the following.

$$c\_2Enumeral\_\_bit\_2EBIT\_\_MODF \in ((((((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{ty\_2Enum\_2Enum})^{ty\_2Enum} \tag{7}$$

Let $c\_2Ebit\_2EBIT\_\_MODIFY : \iota$ be given. Assume the following.

$$c\_2Ebit\_2EBIT\_\_MODIFY \in (((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{((2^2)^{ty\_2Enum\_2Enum})})^{ty\_2Enum\_2Enum} \tag{8}$$

Assume the following.

$$True \tag{9}$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0t \in 2.((\forall V1x \in A\_27a.(p\ V0t)) \Leftrightarrow (p\ V0t))) \tag{10}$$

Assume the following.

$$(\forall V0t \in 2.(((True \wedge (p\ V0t)) \Leftrightarrow (p\ V0t)) \wedge ((((p\ V0t) \wedge True) \Leftrightarrow (p\ V0t)) \wedge (((False \wedge (p\ V0t)) \Leftrightarrow False) \wedge ((((p\ V0t) \wedge False) \Leftrightarrow False) \wedge (((p\ V0t) \wedge (p\ V0t)) \Leftrightarrow (p\ V0t))))))) \tag{11}$$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0x \in A\_27a.((V0x = V0x) \Leftrightarrow True)) \tag{12}$$

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1f \in ((2^2)^{ty\_2Enum\_2Enum}).(\forall V2n \in ty\_2Enum\_2Enum.((ap\ (ap\ (ap\ c\_2Ebit\_2EBIT\_\_MODIFY\ V0m)\ V1f)\ V2n) = (ap\ (ap\ (ap\ (ap\ (ap\ (ap\ c\_2Enumeral\_\_bit\_2EBIT\_\_MODF\ V0m)\ V1f)\ V2n)\ \mathsf{c\_2Enum\_2E0})\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ \mathsf{c\_2Earithmetic\_2EZERO})))\ \mathsf{c\_2Enum\_2E0}))))) \tag{13}$$

Theorem 1

$$((\forall V0m \in ty\_2Enum\_2Enum.(\forall V1f \in ((2^2)^{ty\_2Enum\_2Enum}).((ap\ (ap\ (ap\ c\_2Ebit\_2EBIT\_\_MODIFY\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ V0m))\ V1f)\ \mathsf{c\_2Enum\_2E0}) = (ap\ (ap\ (ap\ (ap\ (ap\ (ap\ c\_2Enumeral\_\_bit\_2EBIT\_\_MODF\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ V0m))\ V1f)\ \mathsf{c\_2Enum\_2E0})\ \mathsf{c\_2Enum\_2E0})\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ \mathsf{c\_2Earithmetic\_2EZERO})))\ \mathsf{c\_2Enum\_2E0}))))\wedge(\forall V2m \in ty\_2Enum\_2Enum.(\forall V3f \in ((2^2)^{ty\_2Enum\_2Enum}).(\forall V4n \in ty\_2Enum\_2Enum.((ap\ (ap\ (ap\ c\_2Ebit\_2EBIT\_\_MODIFY\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ V2m))\ V3f)\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ V4n)) = (ap\ (ap\ (ap\ (ap\ (ap\ (ap\ c\_2Enumeral\_\_bit\_2EBIT\_\_MODF\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ V2m))\ V3f)\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ V4n))\ \mathsf{c\_2Enum\_2E0})\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ \mathsf{c\_2Earithmetic\_2EZERO})))\ \mathsf{c\_2Enum\_2E0}))))))$$