thm_2Enumeral__bit_2EFDUB__FDUB (TMN-WQJ5oNrKyVkjNQkqEgdVquZfQNKRdV8x)

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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 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_2Enum_2E0 *to be* $(ap\ c\_2Enum\_2EABS\_\_num\ c\_2Enum\_2EZERO\_\_REP)$.

Definition 3 *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 4 *We define* c_2Ebool_2ET *to be* $(ap\ (ap\ (\mathsf{c\_2Emin\_2E\_3D}\ (2^2))\ (\lambda V0x \in 2.V0x))\ (\lambda V1x \in 2.V$

Definition 5 *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 6 *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 7 *We define* c_2Earithmetic_2EBIT1 *to be* $\lambda V0n \in ty\_2Enum\_2Enum.(ap\ (ap\ c\_2Earithmetic\_$

Definition 8 *We define* c_2Earithmetic_2EBIT2 *to be* $\lambda V0n \in ty\_2Enum\_2Enum.(ap\ (ap\ c\_2Earithmetic\_$

Definition 9 *We define* c_2Ebool_2EF *to be* $(ap\ (\mathsf{c\_2Ebool\_2E\_21}\ 2)\ (\lambda V0t \in 2.V0t))$.

Definition 10 *We define* c_2Enumeral__bit_2EiSUC *to be* c_2Enum_2ESUC.

Let $c\_2Enumeral\_\_bit\_2EFDUB : \iota$ be given. Assume the following.

$$c\_2Enumeral\_\_bit\_2EFDUB \in ((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{(ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})}) \tag{7}$$

Definition 11 *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 12 *We define* c_2Ebool_2E_2F_5C *to be* $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap\ (\mathsf{c\_2Ebool\_2E\_21}\ 2)\ (\lambda V2t \in$

Assume the following.

$$(\forall V0m \in ty\_2Enum\_2Enum.(\forall V1n \in ty\_2Enum\_2Enum.(((ap\ (ap\ c\_2Earithmetic\_2E\_2B\ \mathsf{c\_2Enum\_2E0})\ V0m) = V0m) \wedge (((ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0m)\ \mathsf{c\_2Enum\_2E0}) = V0m) \wedge (((ap\ (ap\ c\_2Earithmetic\_2E\_2B\ (ap\ \mathsf{c\_2Enum\_2ESUC}\ V0m))\ V1n) = (ap\ \mathsf{c\_2Enum\_2ESUC}\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0m)\ V1n))) \wedge ((ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0m)\ (ap\ \mathsf{c\_2Enum\_2ESUC}\ V1n)) = (ap\ \mathsf{c\_2Enum\_2ESUC}\ (ap\ (ap\ c\_2Earithmetic\_2E\_2B\ V0m)\ V1n)))))))) \tag{8}$$

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.

$$((\forall V0f \in (ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum}).((ap\ (ap\ c\_2Enumeral\_\_bit\_2EFDUB\ V0f)\ \mathsf{c\_2Enum\_2E0}) = \mathsf{c\_2Enum\_2E0})) \wedge (\forall V1f \in (ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum}).(\forall V2n \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Enumeral\_\_bit\_2EFDUB\ V1f)\ (ap\ \mathsf{c\_2Enum\_2ESUC}\ V2n)) = (ap\ V1f\ (ap\ V1f\ (ap\ \mathsf{c\_2Enum\_2ESUC}\ V2n))))))) \tag{13}$$

Theorem 1

$$(\forall V0f \in (ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum}).(((ap\ (ap\ c\_2Enumeral\_\_bit\_2EFDUB\ (ap\ c\_2Enumeral\_\_bit\_2EFDUB\ V0f))\ \mathsf{c\_2Earithmetic\_2EZERO}) = \mathsf{c\_2Earithmetic\_2EZERO}) \wedge ((\forall V1x \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Enumeral\_\_bit\_2EFDUB\ (ap\ c\_2Enumeral\_\_bit\_2EFDUB\ V0f))\ (ap\ \mathsf{c\_2Enumeral\_\_bit\_2EiSUC}\ V1x)) = (ap\ (ap\ c\_2Enumeral\_\_bit\_2EFDUB\ V0f)\ (ap\ (ap\ c\_2Enumeral\_\_bit\_2EFDUB\ V0f)\ (ap\ \mathsf{c\_2Enumeral\_\_bit\_2EiSUC}\ V1x)))))) \wedge ((\forall V2x \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Enumeral\_\_bit\_2EFDUB\ (ap\ c\_2Enumeral\_\_bit\_2EFDUB\ V0f))\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ V2x)) = (ap\ (ap\ c\_2Enumeral\_\_bit\_2EFDUB\ V0f)\ (ap\ (ap\ c\_2Enumeral\_\_bit\_2EFDUB\ V0f)\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ V2x))))) \wedge (\forall V3x \in ty\_2Enum\_2Enum.((ap\ (ap\ c\_2Enumeral\_\_bit\_2EFDUB\ (ap\ c\_2Enumeral\_\_bit\_2EFDUB\ V0f))\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT2}\ V3x)) = (ap\ (ap\ c\_2Enumeral\_\_bit\_2EFDUB\ V0f)\ (ap\ (ap\ c\_2Enumeral\_\_bit\_2EFDUB\ V0f)\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT2}\ V3x)))))))))$$