

thm_2Enumeral_2Enumeral__MIN (TMHRa2D1TUUxUZyPdWxtRbX9R2gN4rPNgMb)

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

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

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 $c_2Ebool_2E_2T$ to be $(ap\ (ap\ (c_2Emin_2E_3D\ (2^2))\ (\lambda V0x \in 2.V0x))\ (\lambda V1x \in 2.V1x))$

Definition 3 We define $c_2Ebool_2E_21$ to be $\lambda A_27a : \iota.(\lambda V0P \in (2^{A_27a}).(ap\ (ap\ (c_2Emin_2E_3D\ (2^{A_27a}))\ (\lambda V1P \in 2.V1P))\ (\lambda V2P \in 2.V2P))$

Definition 4 We define $c_2Earithmetic_2ENUMERAL$ to be $\lambda V0x \in ty_2Enum_2Enum.V0x$.

Definition 5 We define $c_2Ebool_2E_2F$ 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 $(\lambda V0t \in 2.(ap\ (ap\ c_2Emin_2E_3D_3D_3E\ V0t)\ c_2Ebool_2E_2F))$

Definition 8 We define $c_2Ebool_2E_2F_5C$ to be $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap\ (c_2Ebool_2E_21\ 2)\ (\lambda V2t \in 2.V2t))\ (\lambda V3t \in 2.V3t))\ (\lambda V4t \in 2.V4t))$

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 $\lambda V0m \in ty_2Enum_2Enum.(ap\ c_2Enum_2EABS_num\ (c_2Enum_2ESUC_REP\ m))$

Definition 10 We define `c_2Emin_2E_40` to be $\lambda A. \lambda P \in 2^A. \text{if } (\exists x \in A. p \text{ (ap } P \ x)) \text{ then (the } (\lambda x. x \in A) \wedge \dots$ of type $\iota \Rightarrow \iota$.

Definition 11 We define `c_2Ebool_2E_3F` to be $\lambda A_{27a} : \iota. (\lambda V0P \in (2^{A_{27a}}). (\text{ap } V0P \text{ (ap (c_2Emin_2E_40 } \dots$

Definition 12 We define `c_2Eprim_rec_2E_3C` to be $\lambda V0m \in ty_2Enum_2Enum. \lambda V1n \in ty_2Enum_2Enum. \dots$

Definition 13 We define `c_2Ebool_2ECOND` to be $\lambda A_{27a} : \iota. (\lambda V0t \in 2. (\lambda V1t1 \in A_{27a}. (\lambda V2t2 \in A_{27a}. \dots$

Let `c_2Enum_2EZERO_REP` : ι be given. Assume the following.

$$c_2Enum_2EZERO_REP \in \omega \tag{5}$$

Definition 14 We define `c_2Enum_2E0` to be $(\text{ap } c_2Enum_2EABS_num \ c_2Enum_2EZERO_REP)$.

Definition 15 We define `c_2Earithmetic_2EMIN` to be $\lambda V0m \in ty_2Enum_2Enum. \lambda V1n \in ty_2Enum_2Enum. \dots$

Assume the following.

$$\begin{aligned} & (\forall V0n \in ty_2Enum_2Enum. (((\text{ap } (\text{ap } c_2Earithmetic_2EMIN \\ & V0n) \ c_2Enum_2E0) = c_2Enum_2E0) \wedge ((\text{ap } (\text{ap } c_2Earithmetic_2EMIN \\ & c_2Enum_2E0) \ V0n) = c_2Enum_2E0))) \end{aligned} \tag{6}$$

Assume the following.

$$True \tag{7}$$

Assume the following.

$$\begin{aligned} & (\forall V0t \in 2. (((True \wedge (p \ V0t)) \Leftrightarrow (p \ V0t)) \wedge (((p \ V0t) \wedge True) \Leftrightarrow \\ & (p \ V0t)) \wedge (((False \wedge (p \ V0t)) \Leftrightarrow False) \wedge (((p \ V0t) \wedge False) \Leftrightarrow False) \wedge \\ & (((p \ V0t) \wedge (p \ V0t)) \Leftrightarrow (p \ V0t))))) \end{aligned} \tag{8}$$

Assume the following.

$$\forall A_{27a}. nonempty \ A_{27a} \Rightarrow (\forall V0x \in A_{27a}. ((V0x = V0x) \Leftrightarrow True)) \tag{9}$$

Theorem 1

$$\begin{aligned} & (\forall V0x \in ty_2Enum_2Enum. (\forall V1y \in ty_2Enum_2Enum. (\\ & ((\text{ap } (\text{ap } c_2Earithmetic_2EMIN \ c_2Enum_2E0) \ V0x) = c_2Enum_2E0) \wedge \\ & (((\text{ap } (\text{ap } c_2Earithmetic_2EMIN \ V0x) \ c_2Enum_2E0) = c_2Enum_2E0) \wedge \\ & ((\text{ap } (\text{ap } c_2Earithmetic_2EMIN \ (\text{ap } c_2Earithmetic_2ENUMERAL \ V0x)) \\ & (\text{ap } c_2Earithmetic_2ENUMERAL \ V1y)) = (\text{ap } c_2Earithmetic_2ENUMERAL \\ & (\text{ap } (\text{ap } (\text{ap } (c_2Ebool_2ECOND \ ty_2Enum_2Enum) \ (\text{ap } (\text{ap } c_2Eprim_rec_2E_3C \\ & V0x) \ V1y)) \ V0x) \ V1y)))))) \end{aligned}$$