

thm\_2Estring\_2EORD\_\_CHR\_\_COMPUTE  
(TMVE n-  
faQ6bDTT5SpayCh1nmQK5cmWCgFYjT)

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Let  $ty\_2Estring\_2Echar : \iota$  be given. Assume the following.

$$nonempty\ ty\_2Estring\_2Echar \tag{1}$$

**Definition 1** We define  $c\_2Emin\_2E\_3D\_3D\_3E$  to be  $\lambda P \in 2.\lambda Q \in 2.inj\_o (p \Rightarrow p \ Q)$  of type  $\iota$ .

**Definition 2** 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 3** 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 4** We define  $c\_2Ebool\_2E\_21$  to be  $\lambda A\_27a : \iota.(\lambda V0P \in (2^{A\_27a}).(ap (ap (c\_2Emin\_2E\_3D (2^{A\_27a}))$

**Definition 5** We define  $c\_2Ebool\_2E\_5C\_2E\_2F$  to be  $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap (c\_2Ebool\_2E\_21 2) (\lambda V2t \in 2.V2t))$

**Definition 6** We define  $c\_2Ebool\_2E\_2F$  to be  $(ap (c\_2Ebool\_2E\_21 2) (\lambda V0t \in 2.V0t))$ .

**Definition 7** We define  $c\_2Ebool\_2E\_2F\_5C$  to be  $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap (c\_2Ebool\_2E\_21 2) (\lambda V2t \in 2.V2t))$

**Definition 8** We define  $c\_2Emin\_2E\_40$  to be  $\lambda A.\lambda P \in 2^A.if (\exists x \in A.p (ap P x)) \mathbf{then} (the (\lambda x.x \in A \wedge p$  of type  $\iota \Rightarrow \iota$ .

**Definition 9** We define  $c\_2Ebool\_2ECOND$  to be  $\lambda A\_27a : \iota.(\lambda V0t \in 2.(\lambda V1t1 \in A\_27a.(\lambda V2t2 \in A\_27a.(ap$

**Definition 10** 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 11** We define  $c\_2Ecombin\_2EFAIL$  to be  $\lambda A\_27a : \iota.\lambda A\_27b : \iota.(\lambda V0x \in A\_27a.(\lambda V1y \in A\_27b.V1y$

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

$$nonempty\ ty\_2Enum\_2Enum \tag{2}$$

Let  $c\_Estring\_ECHR : \iota$  be given. Assume the following.

$$c\_Estring\_ECHR \in (ty\_Estring\_Echar^{ty\_Eenum\_Eenum}) \quad (3)$$

Let  $c\_Estring\_EORD : \iota$  be given. Assume the following.

$$c\_Estring\_EORD \in (ty\_Eenum\_Eenum^{ty\_Estring\_Echar}) \quad (4)$$

Let  $c\_Eenum\_EZERO\_REP : \iota$  be given. Assume the following.

$$c\_Eenum\_EZERO\_REP \in \omega \quad (5)$$

Let  $c\_Eenum\_EABS\_num : \iota$  be given. Assume the following.

$$c\_Eenum\_EABS\_num \in (ty\_Eenum\_Eenum^{\omega}) \quad (6)$$

**Definition 12** We define  $c\_Eenum\_E0$  to be  $(ap\ c\_Eenum\_EABS\_num\ c\_Eenum\_EZERO\_REP)$ .

**Definition 13** We define  $c\_Earithmetic\_EZERO$  to be  $c\_Eenum\_E0$ .

Let  $c\_Eenum\_EREP\_num : \iota$  be given. Assume the following.

$$c\_Eenum\_EREP\_num \in (\omega^{ty\_Eenum\_Eenum}) \quad (7)$$

Let  $c\_Eenum\_ESUC\_REP : \iota$  be given. Assume the following.

$$c\_Eenum\_ESUC\_REP \in (\omega^{\omega}) \quad (8)$$

**Definition 14** We define  $c\_Eenum\_ESUC$  to be  $\lambda V0n \in ty\_Eenum\_Eenum. (ap\ c\_Eenum\_EABS\_num\ (ap\ c\_Eenum\_EREP\_num\ V0n))$

Let  $c\_Earithmetic\_E\_2B : \iota$  be given. Assume the following.

$$c\_Earithmetic\_E\_2B \in ((ty\_Eenum\_Eenum^{ty\_Eenum\_Eenum})^{ty\_Eenum\_Eenum}) \quad (9)$$

**Definition 15** We define  $c\_Earithmetic\_EBIT1$  to be  $\lambda V0n \in ty\_Eenum\_Eenum. (ap\ (ap\ c\_Earithmetic\_E\_2B\ V0n))$

**Definition 16** We define  $c\_Earithmetic\_EBIT2$  to be  $\lambda V0n \in ty\_Eenum\_Eenum. (ap\ (ap\ c\_Earithmetic\_E\_2B\ V0n))$

**Definition 17** We define  $c\_Earithmetic\_ENUMERAL$  to be  $\lambda V0x \in ty\_Eenum\_Eenum. V0x$ .

**Definition 18** We define  $c\_Ebool\_E\_3F$  to be  $\lambda A\_27a : \iota. (\lambda V0P \in (2^{A\_27a}). (ap\ V0P\ (ap\ (c\_Emin\_E\_40\ V0P))))$

**Definition 19** We define  $c\_Eprim\_rec\_E\_3C$  to be  $\lambda V0m \in ty\_Eenum\_Eenum. \lambda V1n \in ty\_Eenum\_Eenum. (ap\ c\_Eprim\_rec\_E\_3C\ V0m\ V1n)$

Assume the following.

$$True \quad (10)$$

Assume the following.

$$(\forall V0t1 \in 2. (\forall V1t2 \in 2. (((p\ V0t1) \Rightarrow (p\ V1t2)) \Rightarrow (((p\ V1t2) \Rightarrow (p\ V0t1)) \Rightarrow ((p\ V0t1) \Leftrightarrow (p\ V1t2)))))) \quad (11)$$

Assume the following.

$$(\forall V0t \in 2. (False \Rightarrow (p V0t))) \quad (12)$$

Assume the following.

$$(\forall V0t \in 2. ((p V0t) \vee (\neg(p V0t)))) \quad (13)$$

Assume the following.

$$\forall A\_27a.nonempty \ A\_27a \Rightarrow (\forall V0x \in A\_27a. ((V0x = V0x) \Leftrightarrow True)) \quad (14)$$

Assume the following.

$$\forall A\_27a.nonempty \ A\_27a \Rightarrow (\forall V0x \in A\_27a. (\forall V1y \in A\_27a. ((V0x = V1y) \Leftrightarrow (V1y = V0x)))) \quad (15)$$

Assume the following.

$$(\forall V0t \in 2. (((True \Leftrightarrow (p V0t)) \Leftrightarrow (p V0t)) \wedge (((p V0t) \Leftrightarrow True) \Leftrightarrow (p V0t)) \wedge (((False \Leftrightarrow (p V0t)) \Leftrightarrow (\neg(p V0t))) \wedge (((p V0t) \Leftrightarrow False) \Leftrightarrow (\neg(p V0t))))) \quad (16)$$

Assume the following.

$$\forall A\_27a.nonempty \ A\_27a \Rightarrow (\forall V0t1 \in A\_27a. (\forall V1t2 \in A\_27a. (((ap (ap (ap (c\_2Ebool\_2ECOND A\_27a) c\_2Ebool\_2ET) V0t1) V1t2) = V0t1) \wedge ((ap (ap (ap (c\_2Ebool\_2ECOND A\_27a) c\_2Ebool\_2EF) V0t1) V1t2) = V1t2)))) \quad (17)$$

Assume the following.

$$(\forall V0t1 \in 2. (\forall V1t2 \in 2. (\forall V2t3 \in 2. (((p V0t1) \Rightarrow ((p V1t2) \Rightarrow (p V2t3))) \Leftrightarrow (((p V0t1) \wedge (p V1t2)) \Rightarrow (p V2t3))))) \quad (18)$$

Assume the following.

$$\forall A\_27a.nonempty \ A\_27a \Rightarrow (\forall V0P \in 2. (\forall V1Q \in 2. (\forall V2x \in A\_27a. (\forall V3x\_27 \in A\_27a. (\forall V4y \in A\_27a. (\forall V5y\_27 \in A\_27a. (((p V0P) \Leftrightarrow (p V1Q)) \wedge (((p V1Q) \Rightarrow (V2x = V3x\_27)) \wedge ((\neg(p V1Q)) \Rightarrow (V4y = V5y\_27)))) \Rightarrow ((ap (ap (ap (c\_2Ebool\_2ECOND A\_27a) V0P) V2x) V4y) = (ap (ap (ap (c\_2Ebool\_2ECOND A\_27a) V1Q) V3x\_27) V5y\_27)))))) \quad (19)$$

Assume the following.

$$\forall A\_27a.nonempty \ A\_27a \Rightarrow \forall A\_27b.nonempty \ A\_27b \Rightarrow (\forall V0x \in A\_27a. (\forall V1y \in A\_27b. ((ap (ap (c\_2Ecombin\_2EFAIL A\_27a A\_27b) V0x) V1y) = V0x))) \quad (20)$$

Assume the following.

$$\begin{aligned}
& (\forall V0r \in ty\_2Enum\_2Enum. ((p (ap (ap c\_2Eprim\_rec\_2E\_3C \\
& V0r) (ap c\_2Earithmetic\_2ENUMERAL (ap c\_2Earithmetic\_2EBIT2 \\
& (ap c\_2Earithmetic\_2EBIT1 (ap c\_2Earithmetic\_2EBIT1 (ap c\_2Earithmetic\_2EBIT1 \\
& (ap c\_2Earithmetic\_2EBIT1 (ap c\_2Earithmetic\_2EBIT1 (ap c\_2Earithmetic\_2EBIT1 \\
& (ap c\_2Earithmetic\_2EBIT1 c\_2Earithmetic\_2EZERO)))))))))) \Rightarrow \\
& ((ap c\_2Estring\_2EORD (ap c\_2Estring\_2ECHR V0r) = V0r)))
\end{aligned} \tag{21}$$

**Theorem 1**

$$\begin{aligned}
& (\forall V0\_3E\_20255 \in 2. (\forall V1n \in ty\_2Enum\_2Enum. ((ap c\_2Estring\_2EORD \\
& (ap c\_2Estring\_2ECHR V1n)) = (ap (ap (ap (c\_2Ebool\_2ECOND ty\_2Enum\_2Enum) \\
& (ap (ap c\_2Eprim\_rec\_2E\_3C V1n) (ap c\_2Earithmetic\_2ENUMERAL \\
& (ap c\_2Earithmetic\_2EBIT2 (ap c\_2Earithmetic\_2EBIT1 (ap c\_2Earithmetic\_2EBIT1 \\
& (ap c\_2Earithmetic\_2EBIT1 (ap c\_2Earithmetic\_2EBIT1 (ap c\_2Earithmetic\_2EBIT1 \\
& (ap c\_2Earithmetic\_2EBIT1 (ap c\_2Earithmetic\_2EBIT1 c\_2Earithmetic\_2EZERO)))))))))) \\
& V1n) (ap (ap (ap (c\_2Ecombin\_2EFAIL (ty\_2Enum\_2Enum<sup>ty\_2Estring\_2Echar</sup>) \\
& 2) c\_2Estring\_2EORD) V0\_3E\_20255) (ap c\_2Estring\_2ECHR V1n))))))
\end{aligned}$$