

thm_2Ebinary_2IEEE_2Enum2float__compare__float__compare2num
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October 26, 2020

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 $c_2Earithmic_2EZERO$ 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 $(ap\ (ap\ (c_2Emin_2E_3D\ (2^2))\ (\lambda V0x \in 2.V0x))\ (\lambda V1x \in 2.V1x))$

Definition 5 We define $c_2Ebool_2E_21$ to be $\lambda A.\lambda a : \iota.(\lambda V0P \in (2^{A-27a}).(ap\ (ap\ (c_2Emin_2E_3D\ (2^{A-27a}))\ (\lambda V1x \in 2.V1x))\ (\lambda V1x \in 2.V1x))$

Definition 6 We define c_2Enum_2ESUC to be $\lambda V0m \in ty_2Enum_2Enum.(ap\ c_2Enum_2EABS_num\ (ap\ (ap\ (c_2Emin_2E_3D\ (2^2))\ (\lambda V0x \in 2.V0x))\ (\lambda V1x \in 2.V1x))$

Let $c_2Earithmic_2E_2B : \iota$ be given. Assume the following.

$$c_2Earithmic_2E_2B \in ((ty_2Enum_2Enum^{ty_2Enum_2Enum})^{ty_2Enum_2Enum}) \quad (6)$$

Definition 7 We define $c_2Earithmic_2EBIT1$ to be $\lambda V0n \in ty_2Enum_2Enum.(ap (ap c_2Earithmic_2E_2B))$

Definition 8 We define $c_2Earithmic_2EBIT2$ to be $\lambda V0n \in ty_2Enum_2Enum.(ap (ap c_2Earithmic_2E_2B))$

Definition 9 We define $c_2Earithmic_2ENUMERAL$ to be $\lambda V0x \in ty_2Enum_2Enum.V0x$.

Definition 10 We define c_2Ebool_2EF to be $(ap (c_2Ebool_2E_21 2)) (\lambda V0t \in 2.V0t)$.

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 $c_2Ebool_2E_7E$ to be $(\lambda V0t \in 2.(ap (ap c_2Emin_2E_3D_3D_3E V0t) c_2Ebool_2E_21 2))$

Definition 13 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 14 We define $c_2Emin_2E_40$ to be $\lambda A.\lambda P \in 2^A.\mathbf{if} (\exists x \in A.p (ap P x)) \mathbf{then} (the (\lambda x.x \in A \wedge P x))$ of type $\iota \Rightarrow \iota$.

Definition 15 We define $c_2Ebool_2E_3F$ to be $\lambda A_27a : \iota.(\lambda V0P \in (2^{A_27a}).(ap V0P (ap (c_2Emin_2E_40))))$

Definition 16 We define $c_2Eprim_rec_2E_3C$ to be $\lambda V0m \in ty_2Enum_2Enum.\lambda V1n \in ty_2Enum_2Enum.V1n$

Let $ty_2Ebinary_ieee_2Efloat_compare : \iota$ be given. Assume the following.

$$nonempty\ ty_2Ebinary_ieee_2Efloat_compare \quad (7)$$

Let $c_2Ebinary_ieee_2Efloat_compare2num : \iota$ be given. Assume the following.

$$c_2Ebinary_ieee_2Efloat_compare2num \in (ty_2Enum_2Enum^{ty_2Ebinary_ieee_2Efloat_compare}) \quad (8)$$

Let $c_2Ebinary_ieee_2Enum2float_compare : \iota$ be given. Assume the following.

$$c_2Ebinary_ieee_2Enum2float_compare \in (ty_2Ebinary_ieee_2Efloat_compare^{ty_2Enum_2Enum}) \quad (9)$$

Assume the following.

$$\begin{aligned} & ((\forall V0a \in ty_2Ebinary_ieee_2Efloat_compare.((ap c_2Ebinary_ieee_2Enum2float_compare \\ & \quad (ap c_2Ebinary_ieee_2Efloat_compare2num V0a)) = V0a)) \wedge (\forall V1r \in \\ & \quad ty_2Enum_2Enum.((p (ap (\lambda V2n \in ty_2Enum_2Enum.(ap (ap c_2Eprim_rec_2E_3C \\ & \quad V2n) (ap c_2Earithmic_2ENUMERAL (ap c_2Earithmic_2EBIT2 \\ & \quad (ap c_2Earithmic_2EBIT1 c_2Earithmic_2EZERO)))))) V1r)) \Leftrightarrow \\ & \quad ((ap c_2Ebinary_ieee_2Efloat_compare2num (ap c_2Ebinary_ieee_2Enum2float_compare \\ & \quad V1r)) = V1r)))) \end{aligned} \quad (10)$$

Theorem 1

$$(\forall V0a \in ty_2Ebinary_ieee_2Efloat_compare.((ap c_2Ebinary_ieee_2Enum2float_compare (ap c_2Ebinary_ieee_2Efloat_compare2num V0a)) = V0a))$$