

thm_2Eextreal_2Edatatype__extreal (TMHpZ- zUsuvFYJhjQGSHTML4XYgt6RbASZJ3h)

October 26, 2020

Let $ty_2Eextreal_2Eextreal : \iota$ be given. Assume the following.

$$nonempty\ ty_2Eextreal_2Eextreal \tag{1}$$

Let $ty_2Erealax_2Ereal : \iota$ be given. Assume the following.

$$nonempty\ ty_2Erealax_2Ereal \tag{2}$$

Let $c_2Eextreal_2ENormal : \iota$ be given. Assume the following.

$$c_2Eextreal_2ENormal \in (ty_2Eextreal_2Eextreal^{ty_2Erealax_2Ereal}) \tag{3}$$

Let $c_2Eextreal_2EPosInf : \iota$ be given. Assume the following.

$$c_2Eextreal_2EPosInf \in ty_2Eextreal_2Eextreal \tag{4}$$

Let $c_2Eextreal_2ENegInf : \iota$ be given. Assume the following.

$$c_2Eextreal_2ENegInf \in ty_2Eextreal_2Eextreal \tag{5}$$

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

Definition 3 We define $c_2Ebool_2EDATATYPE$ to be $\lambda A_27a : \iota.(\lambda V0x \in A_27a.c_2Ebool_2ET)$.

Definition 4 We define $c_2Ebool_2E_21$ to be $\lambda A_27a : \iota.(\lambda V0P \in (2^{A_27a}).(ap (ap (c_2Emin_2E_3D (2^{A_27a}))$

Assume the following.

$$True \tag{6}$$

Assume the following.

$$\forall A_27a.nonempty\ A_27a \Rightarrow (\forall V0x \in A_27a.((p (ap (c_2Ebool_2EDATATYPE\ A_27a)\ V0x)) \Leftrightarrow True)) \tag{7}$$

Theorem 1

$$(\forall V0extreal \in (((2^{(ty_2Eextreal_2Eextreal^{ty_2Erealax_2Ereal})\ ty_2Eextreal_2Eextreal)}\ ty_2Eextreal_2Eextreal). (p (ap (c_2Ebool_2EDATATYPE\ 2) (ap (ap (ap\ V0extreal\ c_2Eextreal_2ENegInf)\ c_2Eextreal_2EPosInf)\ c_2Eextreal_2ENormal))))))$$