

COALESCABLE EQUIVALENCE RELATION TEMPLATE

Concept Coalescable_Equivalence_Relation_Template(**eval** Size: Integer);

uses Std_Boolean_Fac, Std_Integer_Fac,

Basic_Binary_Relation_Properties;

requires Size > 0;

Family Equiv_Reln $\subseteq ([1..Size] \times [1..Size]) \rightarrow \mathbb{B}$;

exemplar Eqv;

constraints

Is_Reflexive(Eqv) **and** Is_Symmetric(Eqv) **and** Is_Transitive(Eqv);

initialization

ensures $\forall x, y: [1..Size], \text{ if } \text{Eqv}(x, y) \text{ then } x = y$;

Oper Are_Equivalent(**rest** x, y: Integer; **rest** Eqv: Equiv_Reln): Boolean;

requires $x \in [1..Size]$ **and** $y \in [1..Size]$;

ensures Are_Equivalent = (Eqv(x, y));

Oper Make_Equivalent(**rest** x, y: Integer; **upd** Eqv: Equiv_Reln);

requires $x \in [1..Size]$ **and** $y \in [1..Size]$;

ensures $\forall u, v: [1..Size], \text{Eqv}(u, v) \text{ iff } (@\text{Eqv}(u, v) \text{ or }$

$@\text{Eqv}(u, x) \text{ and } @\text{Eqv}(y, v) \text{ or } @\text{Eqv}(u, y) \text{ and } @\text{Eqv}(x, v))$;

Oper Clear_Equivalence(**clr** Eqv: Equiv_Reln);

end Coalescable_Equivalence_Relation_Template;