5.206 k_disjoint

DESCRIPTION LINKS GRAPH

Origin Derived from disjoint

Constraint k_disjoint(SETS)

Type VARIABLES : collection(var−dvar)

Argument SETS : collection(set − VARIABLES)

Restrictions
required(VARIABLES, var)
|VARIABLES| ≥ 1
required(SETS, set)
|SETS| > 1

Purpose Given |SETS| sets of domain variables, the k_disjoint constraint forces that no value is assigned to more than one set.

Example (⟨set − ⟨1, 9, 1, 5⟩, set − ⟨2, 7, 7, 0, 6, 8⟩, set − ⟨4, 4, 3⟩⟩)

The k_disjoint constraint holds since:

- The set of values $\{1, 5, 9\}$ and $\{0, 2, 6, 7, 8\}$ respectively assigned to the variables of the first and second collections have an empty intersection.
- The set of values $\{1, 5, 9\}$ and $\{3, 4\}$ respectively assigned to the variables of the first and third collections have an empty intersection.
- The set of values $\{0, 2, 6, 7, 8\}$ and $\{3, 4\}$ respectively assigned to the variables of the second and third collections have an empty intersection.

Typical |VARIABLES| > 1

Symmetries
- Items of SETS are permutable.
- Items of SETS.set are permutable.
- An occurrence of a value of VARIABLES.var can be replaced by any value of VARIABLES.var.
- All occurrences of two distinct values of SETS.set.var can be swapped; all occurrences of a value of SETS.set.var can be renamed to any unused value.

Arg. properties Contractible wrt. SETS.

See also **part of system of constraints:** disjoint.
used in graph description: disjoint.

Keywords

characteristic of a constraint: disequality.

constraint type: system of constraints, decomposition, value constraint.

modelling: empty intersection.

Arc input(s)	SETS
Arc generator	$CLIQUE(<) \mapsto$ collection(set1, set2)
Arc arity	2
Arc constraint(s)	disjoint(set1.set, set2.set)
Graph property(ies)	**NARC**$= \|\text{SETS}\| * (\|\text{SETS}\| - 1)/2$

Graph model Parts (A) and (B) of Figure 5.460 respectively show the initial and final graph associated with the **Example** slot. To each vertex corresponds a collection of variables, while to each arc corresponds a disjoint constraint.

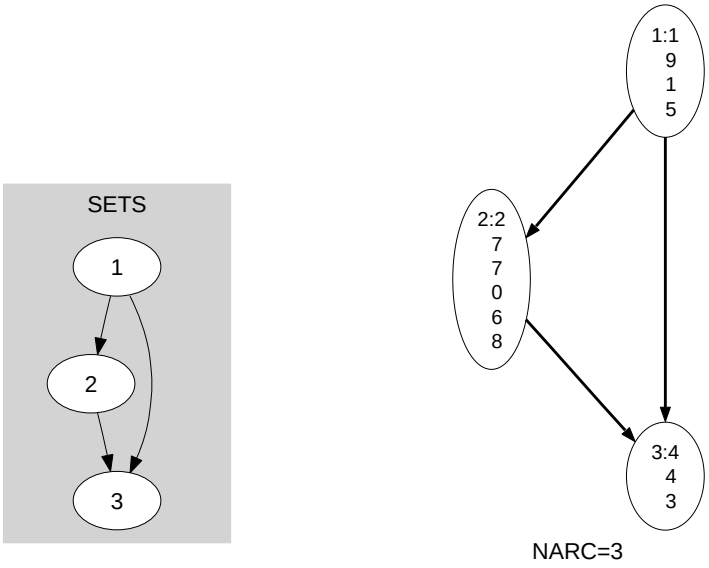

Figure 5.460: Initial and final graph of the k_disjoint constraint