

## 5.210 `k_same_partition`

	DESCRIPTION	LINKS	GRAPH
<b>Origin</b>	Derived from <code>same_partition</code> and from <code>k_same</code> .		
<b>Constraint</b>	<code>k_same_partition(SETS, PARTITIONS)</code>		
<b>Types</b>	VARIABLES : <code>collection(var-dvar)</code> VALUES : <code>collection(val-int)</code>		
<b>Arguments</b>	SETS : <code>collection(set - VARIABLES)</code> PARTITIONS : <code>collection(p - VALUES)</code>		
<b>Restrictions</b>	<code>required(VARIABLES, var)</code> $ VARIABLES  \geq 1$ $ VALUES  \geq 1$ <code>required(VALUES, val)</code> <code>distinct(VALUES, val)</code> <code>required(SETS, set)</code> $ SETS  > 1$ <code>same_size(SETS, set)</code> <code>required(PARTITIONS, p)</code> $ PARTITIONS  \geq 2$		
<b>Purpose</b>	Given a collection of $ SETS $ sets, each containing the same number of domain variables, the <code>k_same_partition</code> constraint forces a <code>same_partition</code> constraint between each pair of consecutive sets.		
<b>Example</b>	$\left( \left\langle \begin{array}{l} \text{set} - \langle 1, 2, 6, 3, 1, 2 \rangle, \\ \text{set} - \langle 6, 6, 2, 3, 1, 3 \rangle, \\ \text{set} - \langle 2, 2, 2, 1, 1, 1 \rangle \end{array} \right\rangle, \right. \\ \left. \langle p - \langle 1, 3 \rangle, p - \langle 4 \rangle, p - \langle 2, 6 \rangle \rangle \right)$		
	The first argument <code>SETS</code> of the <code>k_same_partition</code> constraint corresponds to 3 collections of variables, while the second argument <code>PARTITIONS</code> defines the 3 sets of values $\{1, 3\}$ , $\{4\}$ and $\{2, 6\}$ . The <code>k_same_partition</code> constraint holds since:		
	<ul style="list-style-type: none"> <li>• The first and second collections of variables are assigned 3 values in the <math>\{1, 3\}</math> as well as 3 values in <math>\{2, 6\}</math>.</li> <li>• The second and third collections of variables are also assigned 3 values in the <math>\{1, 3\}</math> as well as 3 values in <math>\{2, 6\}</math>.</li> </ul>		
<b>Typical</b>	$ VARIABLES  > 1$		

**Symmetries**

- Items of SETS are [permutable](#).
- Items of SETS.set are [permutable](#).
- Items of PARTITIONS are [permutable](#).
- Items of PARTITIONS.p are [permutable](#).
- An occurrence of a value of SETS.set.var can be replaced by any other value that also belongs to the same partition of PARTITIONS.

**Arg. properties**

[Contractible](#) wrt. SETS.

**See also**

**common keyword:** [k\\_same](#) (*system of constraints*).

**implies:** [k\\_used\\_by\\_partition](#).

**part of system of constraints:** [same\\_partition](#).

**used in graph description:** [same\\_partition](#).

**Keywords**

**characteristic of a constraint:** [sort based reformulation](#), [partition](#).

**combinatorial object:** [permutation](#).

**constraint type:** [system of constraints](#), [decomposition](#).

<b>Arc input(s)</b>	SETS
<b>Arc generator</b>	$\text{PATH} \mapsto \text{collection}(\text{set1}, \text{set2})$
<b>Arc arity</b>	2
<b>Arc constraint(s)</b>	$\text{same\_partition}(\text{set1.set}, \text{set2.set}, \text{PARTITIONS})$
<b>Graph property(ies)</b>	$\text{NARC} =  \text{SETS}  - 1$

**Graph model**

Parts (A) and (B) of Figure 5.464 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 `same_partition` constraint.

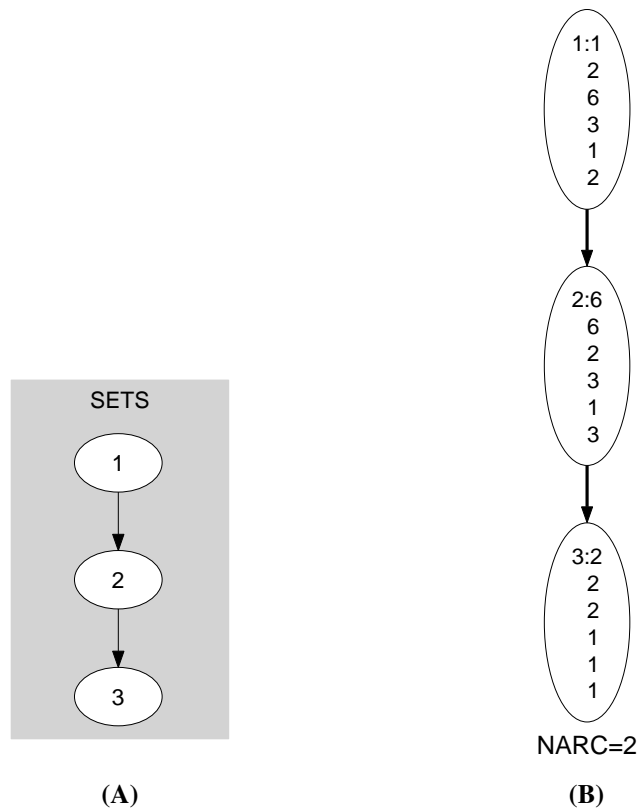


Figure 5.464: Initial and final graph of the `k_same_partition` constraint

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