

5.180 k_same_modulo

	DESCRIPTION	LINKS	GRAPH
Origin	Derived from <code>same_modulo</code> and from <code>k_same</code> .		
Constraint	<code>k_same_modulo(SETS, M)</code>		
Type	VARIABLES : <code>collection(var-dvar)</code>		
Arguments	SETS : <code>collection(set - VARIABLES)</code> M : <code>int</code>		
Restrictions	<code>required(VARIABLES, var)</code> <code> VARIABLES > 0</code> <code>required(SETS, set)</code> <code> SETS > 1</code> <code>same_size(SETS, set)</code> <code>M > 0</code>		
Purpose	<p>Given a collection of <code> SETS </code> sets, each containing the same number of domain variables, the <code>k_same_modulo</code> constraint enforces a <code>same_modulo</code> constraint between each pair of consecutive sets.</p>		

Example

$$\left(\begin{array}{c} \text{set} - \left\langle \begin{array}{l} \text{var} - 1, \\ \text{var} - 9, \\ \text{var} - 1, \\ \text{var} - 5, \\ \text{var} - 2, \\ \text{var} - 1 \\ \text{var} - 6, \\ \text{var} - 4, \\ \text{var} - 1, \\ \text{var} - 1, \\ \text{var} - 5, \\ \text{var} - 5 \\ \text{var} - 1, \\ \text{var} - 3, \\ \text{var} - 4, \\ \text{var} - 2, \\ \text{var} - 8, \\ \text{var} - 7 \end{array} \right\rangle, \\ \left\langle \text{set} - \left\langle \begin{array}{l} \text{var} - 1, \\ \text{var} - 1, \\ \text{var} - 5, \\ \text{var} - 5 \end{array} \right\rangle, \right\rangle, 3 \end{array} \right)$$

The `k_same_modulo` constraint holds since:

- The first and second collections of variables are assigned 1 value in $\{0, 3, \dots, 3 \cdot k\}$, 3 values in $\{1, 4, \dots, 1 + 3 \cdot k\}$ and 2 values in $\{2, 5, \dots, 2 + 3 \cdot k\}$.

- The second and third collections of variables are also assigned 1 value in $\{0, 3, \dots, 3 \cdot k\}$, 3 values in $\{1, 4, \dots, 1 + 3 \cdot k\}$ and 2 values in $\{2, 5, \dots, 2 + 3 \cdot k\}$.

Typical

```
|VARIABLES| > 1  
M > 1
```

Symmetries

- Items of SETS are [permutable](#).
- Items of SETS.set are [permutable](#).
- An occurrence of a value u of SETS.set.var can be [replaced](#) by any other value v such that v is congruent to u modulo M .

See also

common keyword: [k_same](#) (*system of constraints*).

part of system of constraints: [same_modulo](#).

used in graph description: [same_modulo](#).

Keywords

characteristic of a constraint: [modulo](#).

combinatorial object: [permutation](#).

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

Arc input(s)	SETS
Arc generator	$\text{PATH} \mapsto \text{collection}(\text{set1}, \text{set2})$
Arc arity	2
Arc constraint(s)	$\text{same_modulo}(\text{set1.set}, \text{set2.set}, M)$
Graph property(ies)	$\text{NARC} = \text{SETS} - 1$

Graph model

Parts (A) and (B) of Figure 5.362 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_modulo constraint.

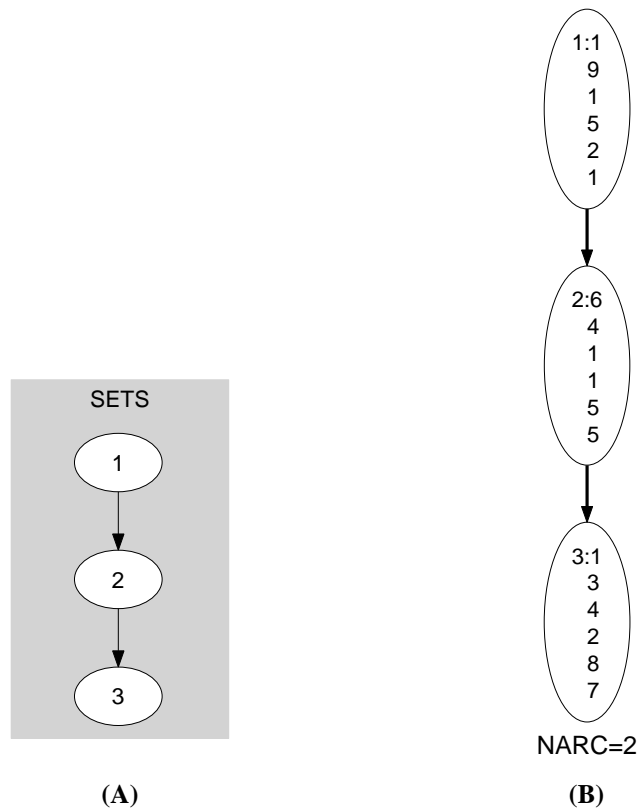


Figure 5.362: Initial and final graph of the k_same_modulo constraint

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