

## 5.6 alldifferent\_between\_sets

	DESCRIPTION	LINKS	GRAPH
<b>Origin</b>	ILOG		
<b>Constraint</b>	alldifferent_between_sets(VARIABLES)		
<b>Synonyms</b>	all_null_intersect, alldiff_between_sets, alldistinct_between_sets, alldiff_on_sets, alldistinct_on_sets, alldifferent_on_sets.		
<b>Argument</b>	VARIABLES : collection(var-svar)		
<b>Restriction</b>	required(VARIABLES, var)		
<b>Purpose</b>	Enforce all sets of the collection VARIABLES to be distinct.		
<b>Example</b>	$\left( \begin{array}{l} \langle \text{var} - \{3, 5\}, \\ \text{var} - \emptyset, \\ \text{var} - \{3\}, \\ \text{var} - \{3, 5, 7\} \rangle \end{array} \right)$ <p>The alldifferent_between_sets constraint holds since all the sets {3, 5}, <math>\emptyset</math>, {3} and {3, 5, 7} are distinct.</p>		
<b>Typical</b>	VARIABLES  > 2		
<b>Symmetry</b>	Items of VARIABLES are <a href="#">permutable</a> .		
<b>Usage</b>	This constraint was available in some configuration library offered by Ilog.		
<b>Algorithm</b>	A filtering algorithm for the alldifferent_between_sets is proposed by C.-G. Quimper and T. Walsh in [302] and a longer version is available in [303] and in [304].		
<b>See also</b>	<a href="#">common keyword: link_set_to_booleans</a> ( <i>constraint involving set variables</i> ). <a href="#">specialisation: alldifferent</a> ( <i>set variable replaced by variable</i> ). <a href="#">used in graph description: eq_set</a> .		
<b>Keywords</b>	<a href="#">characteristic of a constraint: all different, disequality</a> . <a href="#">constraint arguments: constraint involving set variables</a> . <a href="#">filtering: bipartite matching</a> . <a href="#">final graph structure: one_succ</a> .		

<b>Arc input(s)</b>	VARIABLES
<b>Arc generator</b>	<code>CLIQUE</code> $\mapsto$ <code>collection</code> (variables1, variables2)
<b>Arc arity</b>	2
<b>Arc constraint(s)</b>	<code>eq_set</code> (variables1.var, variables2.var)
<b>Graph property(ies)</b>	<code>MAX_NSCC</code> $\leq$ 1
<b>Graph class</b>	<code>ONE_SUCC</code>

**Graph model**

We generate a *clique* with binary *set equalities* constraints between each pair of vertices (including a vertex and itself) and state that the size of the largest strongly connected component should not exceed 1.

Parts (A) and (B) of Figure 5.8 respectively show the initial and final graph associated with the **Example** slot. Since we use the `MAX_NSCC` graph property we show one of the largest strongly connected component of the final graph. The `alldifferent_between_sets` holds since all the strongly connected components have at most one vertex.

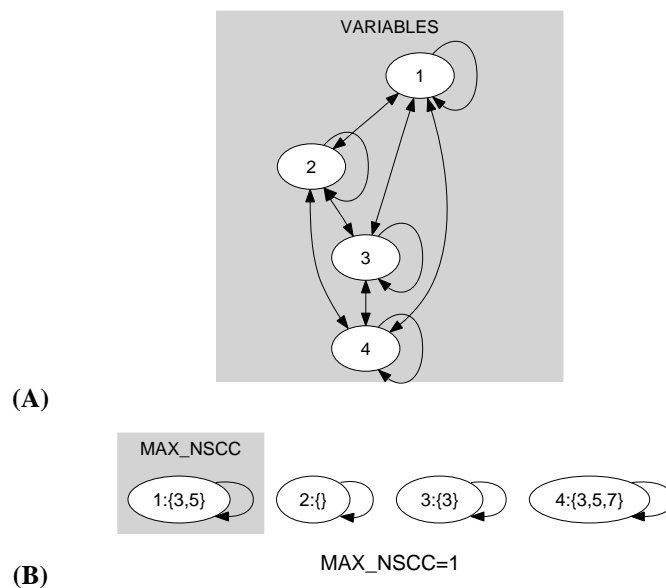


Figure 5.8: Initial and final graph of the `alldifferent_between_sets` constraint