

5.298 **open_atmost**

	DESCRIPTION	LINKS	GRAPH
Origin	Derived from atmost and open_global_cardinality .		
Constraint	<code>open_atmost(S,N,VARIABLES,VALUE)</code>		
Arguments	<div>S : svar N : int VARIABLES : collection(var-dvar) VALUE : int</div>		
Restrictions	<div>$S \geq 1$ $S \leq VARIABLES$ $N \geq 0$ required(VARIABLES, var)</div>		
Purpose	Let \mathcal{V} be the variables of the collection VARIABLES for which the corresponding position belongs to the set S. Positions are numbered from 1. At most N variables of \mathcal{V} are assigned value VALUE.		
Example	<div>$(\{2, 3, 4\}, 1, \langle 2, 2, 4, 5 \rangle, 2)$</div> <p>The <code>open_atmost</code> constraint holds since, within the last three (i.e., $S = \{2, 3, 4\}$) values of the collection $\langle 2, 2, 4, 5 \rangle$, at most $N = 1$ value is equal to value $VALUE = 2$.</p>		
Typical	<div>$N > 0$ $N < VARIABLES$ $VARIABLES > 1$</div>		
Symmetries	<ul style="list-style-type: none">N can be increased.An occurrence of a value of VARIABLES.var can be replaced by any other value that is different from VALUE.		
Arg. properties	Suffix-contractible wrt. VARIABLES.		
See also	<p>common keyword: open_among, open_global_cardinality (<i>open constraint,value constraint</i>).</p> <p>comparison swapped: open_atleast.</p> <p>hard version: atmost.</p> <p>used in graph description: in_set.</p>		
Keywords	<p>constraint arguments: constraint involving set variables.</p> <p>constraint type: open constraint, value constraint.</p> <p>modelling: at most.</p>		

Arc input(s)	VARIABLES
Arc generator	<i>SELF</i> \mapsto collection(variables)
Arc arity	1
Arc constraint(s)	<ul style="list-style-type: none">• variables.var = VALUE• in_set(variables.key, S)
Graph property(ies)	NARC \leq N

Graph model Since each arc constraint involves only one vertex (VALUE is fixed), we employ the *SELF* arc generator in order to produce a graph with a single loop on each vertex. Variables for which the corresponding position does not belong to the set S are removed from the final graph by the second condition of the arc-constraint.

Parts (A) and (B) of Figure 5.633 respectively show the initial and final graph associated with the **Example** slot. Since we use the **NARC** graph property, the loops of the final graph are stressed in bold.

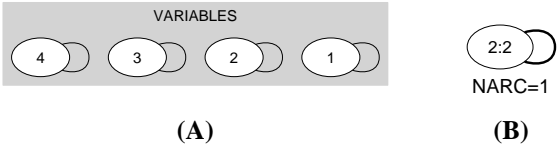


Figure 5.633: Initial and final graph of the open_atmost constraint