

## 5.26 arith\_sliding

	DESCRIPTION	LINKS	GRAPH	AUTOMATON
<b>Origin</b>	Used in the definition of some automaton			
<b>Constraint</b>	<code>arith_sliding(VARIABLES, RELOP, VALUE)</code>			
<b>Arguments</b>	VARIABLES : <code>collection</code> (var-dvar) RELOP : <code>atom</code> VALUE : <code>int</code>			
<b>Restrictions</b>	<code>required</code> (VARIABLES, var) RELOP ∈ [=, ≠, <, ≥, >, ≤]			
<b>Purpose</b>	Enforce for all sequences of variables $\text{var}_1, \text{var}_2, \dots, \text{var}_i$ ( $1 \leq i \leq  \text{VARIABLES} $ ) of the VARIABLES collection to have $(\text{var}_1 + \text{var}_2 + \dots + \text{var}_i)$ RELOP VALUE.			
<b>Example</b>	$\left( \begin{array}{c} \text{var} - 0, \\ \text{var} - 0, \\ \langle \text{var} - 1, \\ \text{var} - 2, \rangle, <, 4 \\ \text{var} - 0, \\ \text{var} - 0, \\ \text{var} - -3 \end{array} \right)$			
	The <code>arith_sliding</code> constraint holds since all the following seven inequalities hold: <ul style="list-style-type: none"> <li>• <math>0 &lt; 4</math>,</li> <li>• <math>0 + 0 &lt; 4</math>,</li> <li>• <math>0 + 0 + 1 &lt; 4</math>,</li> <li>• <math>0 + 0 + 1 + 2 &lt; 4</math>,</li> <li>• <math>0 + 0 + 1 + 2 + 0 &lt; 4</math>,</li> <li>• <math>0 + 0 + 1 + 2 + 0 + 0 &lt; 4</math>,</li> <li>• <math>0 + 0 + 1 + 2 + 0 + 0 - 3 &lt; 4</math>.</li> </ul>			
<b>Typical</b>	<code> VARIABLES  &gt; 1</code>			
<b>See also</b>	<b>common keyword:</b> <code>sum_ctr</code> ( <i>arithmetic constraint</i> ). <b>part of system of constraints:</b> <code>arith</code> . <b>used in graph description:</b> <code>arith</code> .			
<b>Keywords</b>	<b>characteristic of a constraint:</b> hypergraph, automaton, automaton with counters. <b>combinatorial object:</b> sequence. <b>constraint type:</b> arithmetic constraint, decomposition, sliding sequence constraint.			

<b>Arc input(s)</b>	VARIABLES
<b>Arc generator</b>	$PATH\_1 \mapsto collection$
<b>Arc arity</b>	*
<b>Arc constraint(s)</b>	$arith(collection, RELOP, VALUE)$
<b>Graph property(ies)</b>	$NARC =  VARIABLES $

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**Automaton**

Figure 5.48 depicts the automaton associated with the `arith_sliding` constraint. To each item of the collection `VARIABLES` corresponds a signature variable  $S_i$  that is equal to 0.

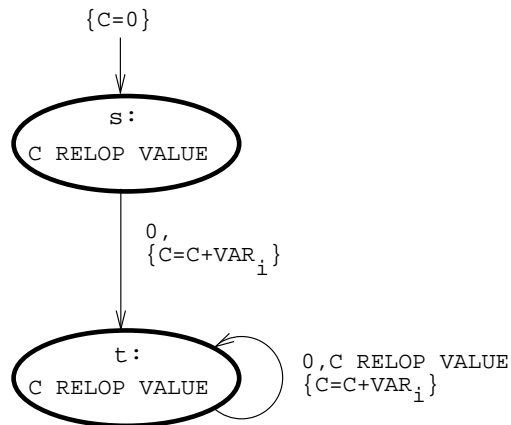


Figure 5.48: Automaton of the `arith_sliding` constraint

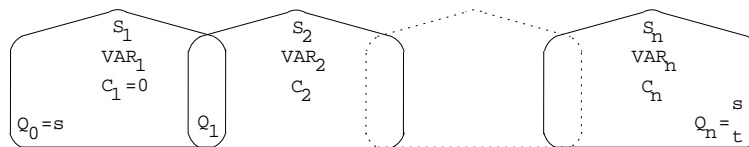


Figure 5.49: Hypergraph of the reformulation corresponding to the automaton of the `arith_sliding` constraint

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