

5.26 arith_sliding

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

Arc input(s)	VARIABLES
Arc generator	<i>PATH_1</i> \mapsto collection
Arc arity	*
Arc constraint(s)	arith(collection, RELOP, VALUE)
Graph property(ies)	NARC = VARIABLES

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.

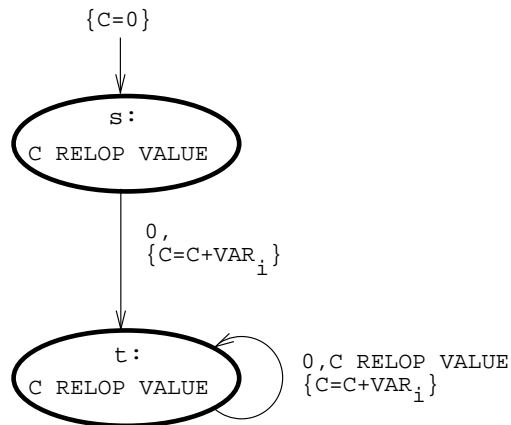


Figure 5.48: Automaton of the `arith_sliding` constraint

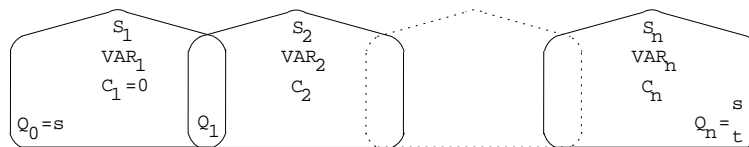


Figure 5.49: Hypergraph of the reformulation corresponding to the automaton of the `arith_sliding` constraint

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