

5.351 sliding_distribution

	DESCRIPTION	LINKS	GRAPH
Origin	[351]		
Constraint	sliding_distribution(SEQ, VARIABLES, VALUES)		
Arguments	SEQ : int VARIABLES : collection(var-dvar) VALUES : collection(val-int, omin-int, omax-int)		
Restrictions	SEQ > 0 SEQ ≤ VARIABLES required(VARIABLES, var) VALUES > 0 required(VALUES, [val, omin, omax]) distinct(VALUES, val) VALUES.omin ≥ 0 VALUES.omax ≤ SEQ VALUES.omin ≤ VALUES.omax		
Purpose	For each sequence of SEQ consecutive variables of the VARIABLES collection, each value VALUES[i].val (1 ≤ i ≤ VALUES) should be taken by at least VALUES[i].omin and at most VALUES[i].omax variables.		
Example	$\left(\begin{array}{l} 4, \langle 0, 5, 0, 6, 5, 0, 0 \rangle, \\ \begin{array}{lll} \text{val} - 0 & \text{omin} - 1 & \text{omax} - 2, \\ \left\langle \begin{array}{lll} \text{val} - 1 & \text{omin} - 0 & \text{omax} - 4, \\ \text{val} - 4 & \text{omin} - 0 & \text{omax} - 4, \\ \text{val} - 5 & \text{omin} - 1 & \text{omax} - 2, \\ \text{val} - 6 & \text{omin} - 0 & \text{omax} - 2 \end{array} \right\rangle \end{array} \end{array} \right)$		
	The sliding_distribution constraint holds since:		
	<ul style="list-style-type: none">On the first sequence of 4 consecutive values 0 5 0 6 values 0, 1, 4, 5 and 6 are respectively used 2, 0, 0, 1 and 1 times.On the second sequence of 4 consecutive values 5 0 6 5 values 0, 1, 4, 5 and 6 are respectively used 1, 0, 0, 2 and 1 times.On the third sequence of 4 consecutive values 0 6 5 0 values 0, 1, 4, 5 and 6 are respectively used 2, 0, 0, 1 and 1 times.On the fourth sequence of 4 consecutive values 6 5 0 0 values 0, 1, 4, 5 and 6 are respectively used 2, 0, 0, 1 and 1 times.		
Typical	SEQ > 1 SEQ < VARIABLES VARIABLES > VALUES		

Symmetries

- Items of VARIABLES can be [reversed](#).
- An occurrence of a value of VARIABLES.var that does not belong to VALUES.val can be [replaced](#) by any other value that also does not belong to VALUES.val.
- Items of VALUES are [permutable](#).
- VALUES.omin can be [decreased](#) to any value ≥ 0 .
- VALUES.omax can be [increased](#) to any value $\leq \text{SEQ}$.
- All occurrences of two distinct values in VARIABLES.var or VALUES.val can be [swapped](#); all occurrences of a value in VARIABLES.var or VALUES.val can be [renamed](#) to any unused value.

Arg. properties

- [Contractible](#) wrt. VARIABLES when $\text{SEQ} = 1$.
- [Prefix-contractible](#) wrt. VARIABLES.
- [Suffix-contractible](#) wrt. VARIABLES.
- [Contractible](#) wrt. VALUES.

See also

common keyword: [pattern](#), [sliding-sum](#), [stretch_circuit](#), [stretch_path](#) (*sliding sequence constraint*).

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

specialisation: [among_seq](#) (*individual values replaced by single set of values*).

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

Keywords

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

combinatorial object: [sequence](#).

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

Arc input(s)	VARIABLES
Arc generator	$\text{PATH} \mapsto \text{collection}$
Arc arity	SEQ
Arc constraint(s)	$\text{global_cardinality_low_up}(\text{collection}, \text{VALUES})$
Graph property(ies)	$\text{NARC} = \text{VARIABLES} - \text{SEQ} + 1$

Graph model Note that the `sliding_distribution` constraint is a constraint where the arc constraints do not have an arity of 2.

Parts (A) and (B) of Figure 5.705 respectively show the initial and final graph associated with the **Example** slot. Since all arc constraints hold (i.e., because of the graph property $\text{NARC} = |\text{VARIABLES}| - \text{SEQ} + 1$) the final graph corresponds to the initial graph.

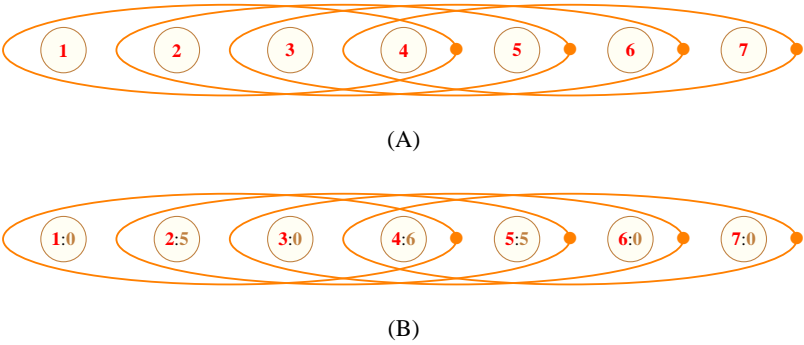


Figure 5.705: (A) Initial and (B) final graph of the `sliding_distribution(4, <0, 5, 0, 6, 5, 0, 0>, <0 1 2, 1 0 4, 4 0 4, 5 1 2, 6 0 2>)` constraint of the **Example** slot where each ellipse represents an hyperedge involving $\text{SEQ} = 4$ vertices (to each ellipse corresponds a `global_cardinality_low_up` constraint)

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