5.348 size_max_seq_alldifferent

DESCRIPTION LINKS GRAPH

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Constraint size_max_seq_alldifferent(SIZE, VARIABLES)

Synonyms size_maximal_sequence_alldiff, size_maximal_sequence_alldistinct, size_maximal_sequence_alldifferent.

Arguments

SIZE	:	dvar
VARIABLES	:	collection(var−dvar)

Restrictions

SIZE ≥ 0
SIZE $\leq |$VARIABLES$|$
required(VARIABLES, var)

Purpose SIZE is the size of the maximal sequence (among all possible sequences of consecutive variables of the collection VARIABLES) for which the alldifferent constraint holds.

Example

$(4, \langle 2, 2, 4, 5, 2, 7, 4\rangle)$
$(1, \langle 2, 2, 2, 2, 2, 2, 2\rangle)$
$(2, \langle 2, 2, 4, 4, 4, 7, 4\rangle)$
$(7, \langle 2, 0, 4, 6, 5, 7, 3\rangle)$

The first size_max_seq_alldifferent constraint holds since the constraint alldifferent$(\langle \text{var}-4, \text{var}-5, \text{var}-2, \text{var}-7\rangle)$ holds and since the following three constraints do not hold:

- alldifferent$(\langle \text{var}-2, \text{var}-2, \text{var}-4, \text{var}-5, \text{var}-2\rangle)$,
- alldifferent$(\langle \text{var}-2, \text{var}-4, \text{var}-5, \text{var}-2, \text{var}-7\rangle)$,
- alldifferent$(\langle \text{var}-4, \text{var}-5, \text{var}-2, \text{var}-7, \text{var}-4\rangle)$.

Typical

SIZE > 2
SIZE $<$ |VARIABLES|
range(VARIABLES.var) > 1

Symmetry One and the same constant can be added to the var attribute of all items of VARIABLES.

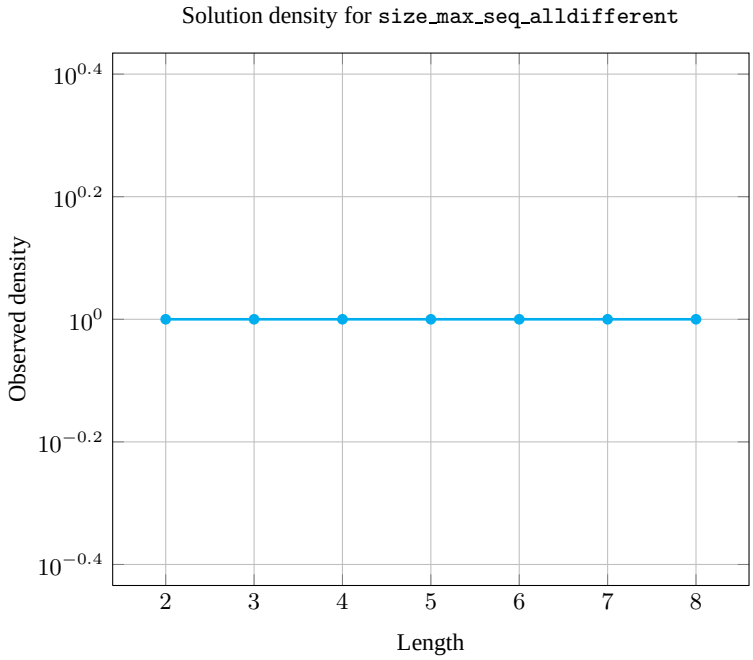
Arg. properties

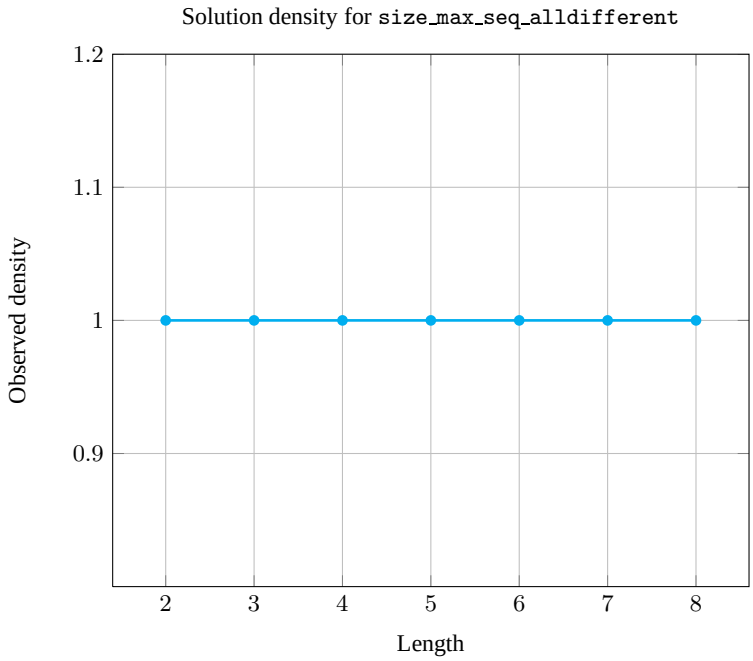
Functional dependency: SIZE determined by VARIABLES.

Counting

Length (n)	2	3	4	5	6	7	8
Solutions	9	64	625	7776	117649	2097152	43046721

Number of solutions for `size_max_seq_alldifferent`: domains $0..n$

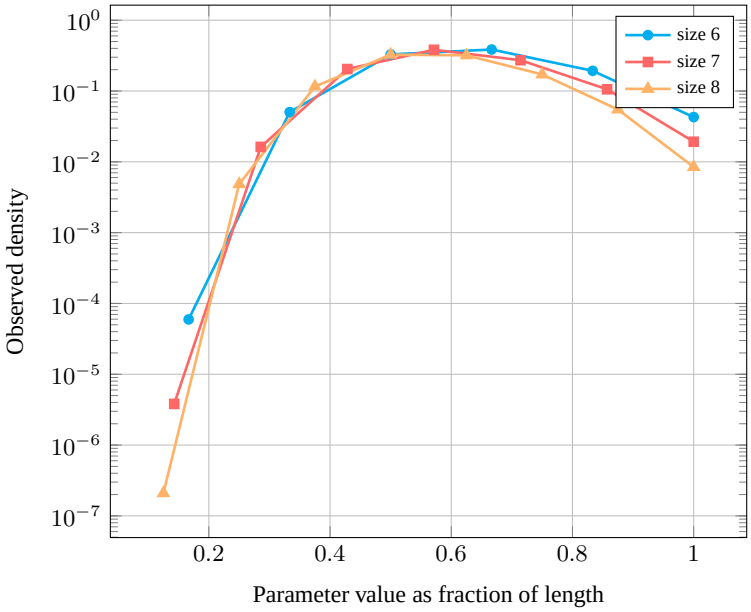




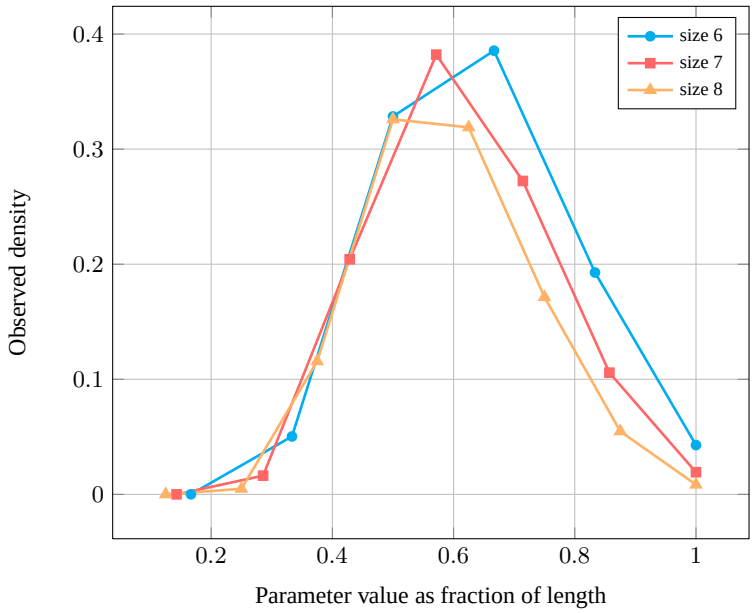
Length (n)		2	3	4	5	6	7	8
Total		9	64	625	7776	117649	2097152	43046721
Parameter value	1	3	4	5	6	7	8	9
	2	6	36	200	1050	5922	34104	208224
	3	-	24	300	3480	38640	428400	4981032
	4	-	-	120	2520	45360	801360	14028336
	5	-	-	-	720	22680	571200	13728960
	6	-	-	-	-	5040	221760	7378560
	7	-	-	-	-	-	40320	2358720
	8	-	-	-	-	-	-	362880

Solution count for `size_max_seq_alldifferent`: domains $0..n$

Solution density for `size_max_seq_alldifferent`



Solution density for `size_max_seq_alldifferent`



See also **common keyword:** `alldifferent`, `open_alldifferent`, `size_max_starting_seq_alldifferent` (*all different*,*disequality*).

implies: `atleast_nvalue`.

Keywords **characteristic of a constraint:** all different, disequality, hypergraph.

combinatorial object: sequence.

constraint arguments: pure functional dependency.

constraint type: sliding sequence constraint, conditional constraint.

modelling: functional dependency.

Arc input(s)	VARIABLES
Arc generator	$PATH\_N \mapsto$ collection
Arc arity	$*$
Arc constraint(s)	alldifferent(collection)
Graph property(ies)	NARC$=$ SIZE

Graph model Note that this is an example of global constraint where the arc constraints do not have the same arity. However they correspond to the same type of constraint.