5.329 proper_circuit

DESCRIPTION LINKS

Origin Derived from circuit

Constraint proper_circuit(NODES)

Synonym circuit.

Argument NODES : collection(index−int, succ−dvar)

Restrictions
|NODES| > 1
required(NODES, [index, succ])
NODES.index ≥ 1
NODES.index ≤ |NODES|
distinct(NODES, index)
NODES.succ ≥ 1
NODES.succ ≤ |NODES|

Purpose Enforce to cover a digraph G described by the NODES collection with one circuit visiting once a subset of the vertices of G.

Example

$$\left(\left\langle \begin{array}{ll} \texttt{index} - 1 & \texttt{succ} - 2, \\ \texttt{index} - 2 & \texttt{succ} - 3, \\ \texttt{index} - 3 & \texttt{succ} - 1, \\ \texttt{index} - 4 & \texttt{succ} - 4 \end{array} \right\rangle\right)$$

The proper_circuit constraint holds since its NODES argument depicts the following circuit visiting successively the vertices 1, 2, 3 and 1 (i.e., node 4 is not visited).

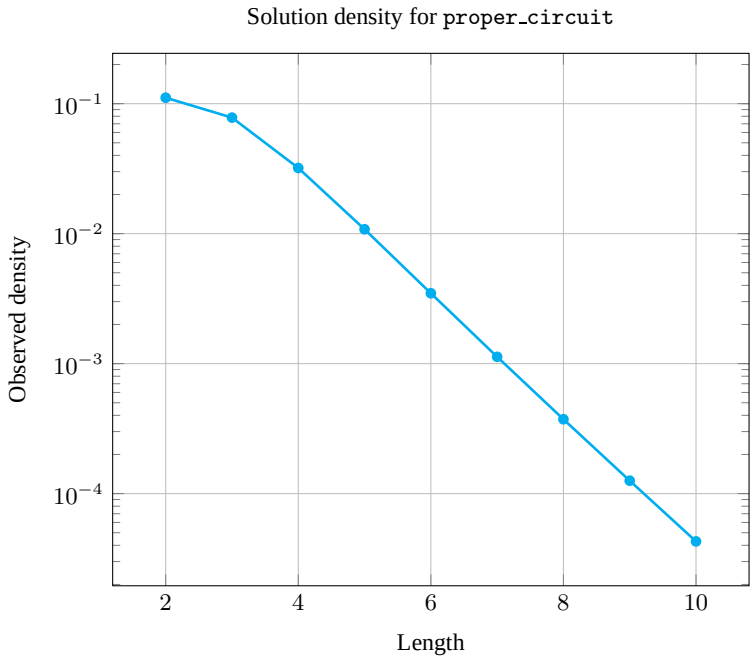
Typical |NODES| > 2

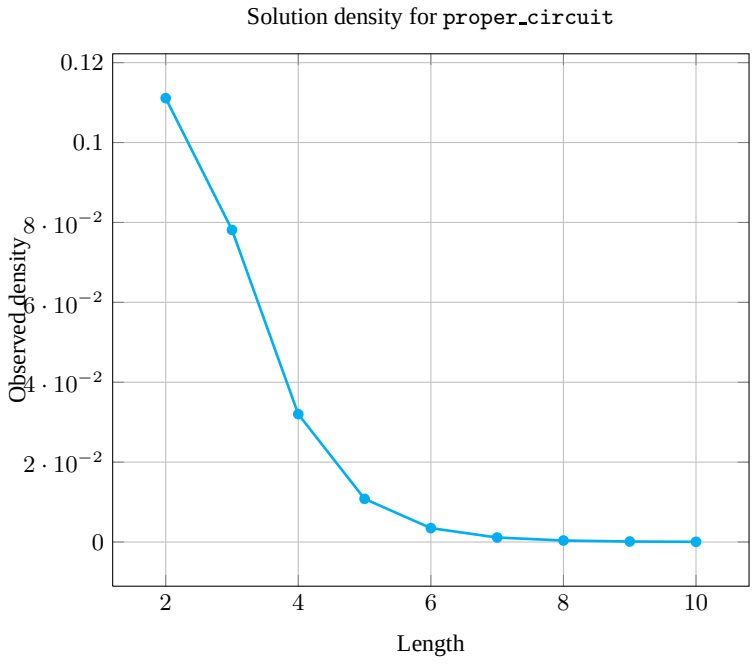
Symmetry Items of NODES are permutable.

Counting

Length (n)	2	3	4	5	6	7	8	9	10
Solutions	1	5	20	84	409	2365	16064	125664	1112073

Number of solutions for proper_circuit: domains $0..n$





See also

common keyword: `alldifferent` (*permutation*), `circuit` (*permutation*, *one_succ*), `path` (*graph partitioning constraint*, *one_succ*).

implied by: `circuit`.

implies: `permutation`, `twin`.

implies (items to collection): `lex_alldifferent`.

Keywords

combinatorial object: permutation.

constraint type: graph constraint, graph partitioning constraint.

filtering: DFS-bottleneck.

final graph structure: circuit, one_succ.