5.328 product_ctr

DESCRIPTION LINKS GRAPH

Origin Arithmetic constraint.

Constraint product_ctr(VARIABLES, CTR, VAR)

Arguments

VARIABLES	:	collection(var−dvar)
CTR	:	atom
VAR	:	dvar

Restrictions

required(VARIABLES, var)
CTR $\in [=, \neq, <, \geq, >, \leq]$

Purpose Constraint the product of a set of domain variables. More precisely, let P denote the product of the variables of the VARIABLES collection. Enforce the following constraint to hold: P CTR VAR.

Example $(\langle 2, 1, 4\rangle, =, 8)$

The product_ctr constraint holds since its last argument VAR $= 8$ is equal (i.e., CTR is set to $=$) to $2 \cdot 1 \cdot 4$.

Typical

|VARIABLES| > 1
|VARIABLES| < 10
range(VARIABLES.var) > 1
VARIABLES.var $\neq 0$
CTR $\in [=, <, \geq, >, \leq]$
VAR $\neq 0$

Symmetry Items of VARIABLES are permutable.

Arg. properties

- Contractible wrt. VARIABLES when CTR $\in [<, \leq]$ and minval(VARIABLES.var) > 0.
- Aggregate: VARIABLES(union), CTR(id), VAR($*$) when CTR $\in [=]$.

Used in cumulative_product.

See also **common keyword:** range_ctr, sum_ctr *(arithmetic constraint)*.

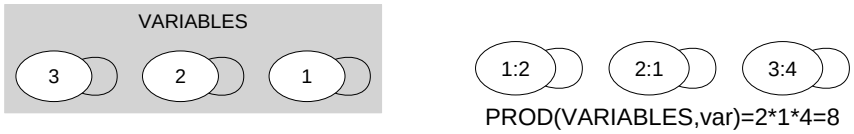
Keywords **characteristic of a constraint:** product.

constraint type: arithmetic constraint.

Arc input(s)	VARIABLES
Arc generator	$SELF \mapsto$ collection(variables)
Arc arity	1
Arc constraint(s)	TRUE
Graph property(ies)	**PROD**(VARIABLES, var) CTR VAR

Graph model Since we want to keep all the vertices of the initial graph we use the $SELF$ arc generator together with the TRUE arc constraint. This predefined arc constraint always holds.

Parts (A) and (B) of Figure 5.676 respectively show the initial and final graph associated with the **Example** slot. Since we use the TRUE arc constraint both graphs are identical.



(A) **(B)**

Figure 5.676: Initial and final graph of the product_ctr constraint