5.311 orth_on_the_ground

DESCRIPTION LINKS GRAPH

Origin Used for defining place_in_pyramid.

Constraint orth_on_the_ground(ORTHOTOPE, VERTICAL_DIM)

Arguments

ORTHOTOPE	:	collection(ori−dvar, siz−dvar, end−dvar)
VERTICAL_DIM	:	int

Restrictions

$|\texttt{ORTHOTOPE}| > 0$
require_at_least(2, ORTHOTOPE, [ori, siz, end])
$\texttt{ORTHOTOPE.siz} \geq 0$
$\texttt{ORTHOTOPE.ori} \leq \texttt{ORTHOTOPE.end}$
$\texttt{VERTICAL\_DIM} \geq 1$
$\texttt{VERTICAL\_DIM} \leq |\texttt{ORTHOTOPE}|$
orth_link_ori_siz_end(ORTHOTOPE)

Purpose The ori attribute of the $\texttt{VERTICAL\_DIM}^{th}$ item of the ORTHOTOPES collection should be fixed to one.

Example $(\langle \texttt{ori} - 1\ \texttt{siz} - 2\ \texttt{end} - 3, \texttt{ori} - 2\ \texttt{siz} - 3\ \texttt{end} - 5\rangle, 1)$

The orth_on_the_ground constraint holds since the ori attribute of its 1^{th} item $\langle \texttt{ori} - 1\ \texttt{siz} - 2\ \texttt{end} - 3\rangle$ (i.e., 1^{th} item since $\texttt{VERTICAL\_DIM} = 1$) is set to one.

Typical

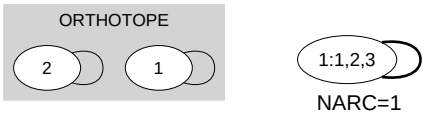
$|\texttt{ORTHOTOPE}| > 1$
$\texttt{ORTHOTOPE.siz} > 0$

Used in place_in_pyramid.

Keywords **geometry:** geometrical constraint, orthotope.

Arc input(s)	ORTHOTOPE
Arc generator	$SELF \mapsto$ collection(orthotope)
Arc arity	1
Arc constraint(s)	• orthotope.key = VERTICAL_DIM • orthotope.ori = 1
Graph property(ies)	**NARC**= 1

Graph model Parts (A) and (B) of Figure 5.632 respectively show the initial and final graph associated with the **Example** slot. Since we use the **NARC** graph property, the loop of the final graph is stressed in bold.



(A)

(B)

Figure 5.632: Initial and final graph of the orth_on_the_ground constraint

Signature Since all the key attributes of the ORTHOTOPES collection are distinct, because of the first condition of the arc constraint, and since we use the $SELF$ arc generator the final graph contains at most one arc. Therefore we can rewrite the graph property $\mathbf{NARC} = 1$ to $\mathbf{NARC} \geq 1$ and simplify $\underline{\mathbf{NARC}}$ to $\overline{\mathbf{NARC}}$.