

5.326 precedence

	DESCRIPTION	LINKS	GRAPH
Origin	Scheduling		
Constraint	precedence(TASKS)		
Argument	TASKS : <code>collection(origin-dvar,duration-dvar)</code>		
Restrictions	<code>required(TASKS,[origin,duration])</code> <code>TASKS.duration ≥ 0</code>		
Purpose	All consecutive pairs of tasks of the collection TASKS should be ordered (i.e., the end of the first task of a pair should be less than or equal to the start of the second task of the same pair).		
Example	$\left(\left\langle \begin{array}{ll} \text{origin} - 1 & \text{duration} - 3, \\ \text{origin} - 4 & \text{duration} - 0, \\ \text{origin} - 5 & \text{duration} - 2, \\ \text{origin} - 8 & \text{duration} - 1 \end{array} \right\rangle \right)$ <p>Since the tasks are ordered (i.e., $1 + 3 \leq 4$, $4 + 0 \leq 5$, $5 + 2 \leq 8$) the precedence constraint holds.</p>		
Typical	<code> TASKS > 2</code> <code>TASKS.duration ≥ 1</code>		
Symmetries	<ul style="list-style-type: none"> • TASKS.duration can be decreased to any value ≥ 0. • One and the same constant can be added to the origin attribute of all items of TASKS. 		
Arg. properties	Contractible wrt. TASKS.		
See also	common keyword: increasing (<i>order constraint</i>). implies: disjunctive . implies (items to collection): <code>lex_chain_lesseq</code> .		
Keywords	constraint type: <code>decomposition</code> , <code>order constraint</code> . filtering: <code>arc-consistency</code> .		

Arc input(s)	TASKS
Arc generator	$PATH \mapsto \text{collection}(\text{tasks1}, \text{tasks2})$
Arc arity	2
Arc constraint(s)	$\text{tasks1.origin} + \text{tasks1.duration} \leq \text{tasks2.origin}$
Graph property(ies)	$NARC = \text{TASKS} - 1$

Graph model

Since we are only interested by the constraints linking two consecutive items of the collection TASKS we use *PATH* to generate the arcs of the initial graph.

Parts (A) and (B) of Figure 5.656 respectively show the initial and final graph of the first example of the **Example** slot. Since we use the *NARC* graph property, the arcs of the final graph are stressed in bold.

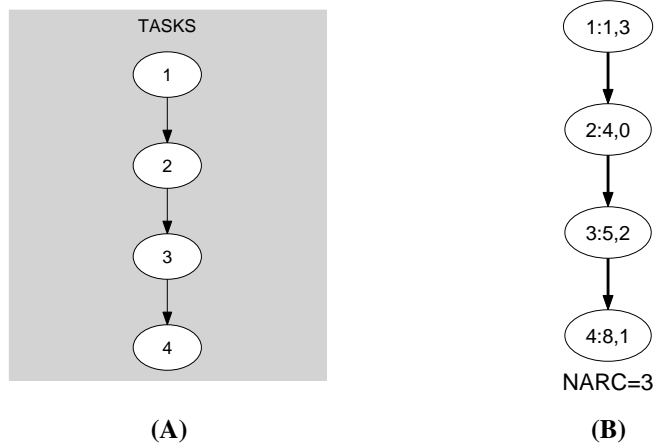


Figure 5.656: Initial and final graph of the precedence constraint