5.392 sum_set

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Constraint   sum_set(SV, VALUES, CTR, VAR)

Arguments
SV   : svar
VALUES : collection(val−int, coef−int)
CTR   : atom
VAR   : dvar

Restrictions
required(VALUES, [val, coef])
distinct(VALUES, val)
VALUES.coef ≥ 0
CTR $\in [=, \neq, <, \geq, >, \leq]$

Purpose   Let SUM denote the sum of the coef attributes of the VALUES collection for which the corresponding values val occur in the set SV. Enforce the following constraint to hold: SUM CTR VAR.

Example
$$\left(\begin{array}{l} \{2, 3, 6\}, \\ \left\langle \begin{array}{ll} \text{val} - 2 & \text{coef} - 7, \\ \text{val} - 9 & \text{coef} - 1, \\ \text{val} - 5 & \text{coef} - 7, \\ \text{val} - 6 & \text{coef} - 2 \end{array} \right\rangle, =, 9 \end{array} \right)$$

The sum_set constraint holds since the sum of the coef attributes $7 + 2$ for which the corresponding val attribute belongs to the first argument SV $= \{2, 3, 6\}$ is equal (i.e., since CTR is set to $=$) to its last argument VAR $= 9$.

Typical
|VALUES| > 1
VALUES.coef > 0
CTR $\in [=, <, \geq, >, \leq]$

Symmetry   Items of VALUES are permutable.

Systems   weights   in **Gecode**.

See also   **common keyword:** sum, sum_ctr *(sum)*.

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

                  constraint arguments: binary constraint, constraint involving set variables.

                  constraint type: arithmetic constraint.

Arc input(s)	VALUES
Arc generator	$SELF \mapsto$ collection(values)
Arc arity	1
Arc constraint(s)	in_set(values.val, SV)
Graph property(ies)	**SUM**(VALUES, coef) CTR VAR

Graph model   Parts (A) and (B) of Figure 5.748 respectively show the initial and final graph associated with the **Example** slot.

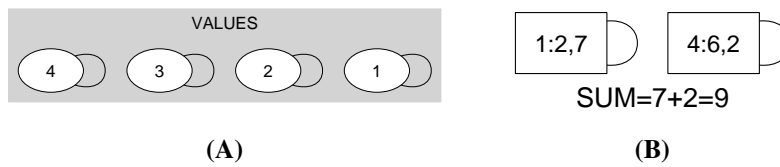

(A)   **(B)**

Figure 5.748: Initial and final graph of the sum_set constraint