5.235 not_in

DESCRIPTION LINKS GRAPH AUTOMATON

Origin

Derived from `in`.

Constraint

`not_in(VAR, VALUES)`

Arguments

```
VAR    : dvar
VALUES : collection(val-int)
```

Restrictions

```
required(VALUES, val)
distinct(VALUES, val)
```

Purpose

Remove the values of the `VALUES` collection from the domain variable `VAR`.

Example

$(2, \langle 1, 3\rangle)$

The constraint `not_in` holds since the value of its first argument `VAR` $= 2$ does not occur within the collection $\langle 1, 3\rangle$.

Symmetries

- Items of `VALUES` are permutable.
- One and the same constant can be added to `VAR` as well as to the `val` attribute of all items of `VALUES`.

Remark

Entailment occurs immediately after posting this constraint and removing all values in `VALUES` from `VAR`.

Systems

`notMember` in **Choco**, `rel` in **Gecode**.

Used in

`group`.

See also

negation: `in`.

Keywords

characteristic of a constraint: disequality, automaton, automaton without counters, reified automaton constraint, derived collection.

constraint arguments: unary constraint.

constraint network structure: centered cyclic(1) constraint network(1).

constraint type: value constraint.

filtering: arc-consistency, entailment.

modelling: excluded, domain definition.

Derived Collection $\texttt{col}(\texttt{VARIABLES}-\texttt{collection}(\texttt{var}-\texttt{dvar}), [\texttt{item}(\texttt{var} - \texttt{VAR})])$

Arc input(s) VARIABLES VALUES

Arc generator $PRODUCT \mapsto \texttt{collection}(\texttt{variables}, \texttt{values})$

Arc arity 2

Arc constraint(s) $\texttt{variables.var} = \texttt{values.val}$

Graph property(ies) $\mathbf{NARC} = 0$

Graph model Figure 5.448 shows the initial graph associated with the **Example** slot. Since we use the $\mathbf{NARC} = 0$ graph property the corresponding final graph is empty.

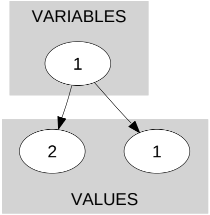

Figure 5.448: Initial graph of the not_in constraint (the final graph is empty)

Signature Since 0 is the smallest number of arcs of the final graph we can rewrite $\mathbf{NARC} = 0$ to $\mathbf{NARC} \leq 0$. This leads to simplify $\overline{\underline{\mathbf{NARC}}}$ to $\underline{\mathbf{NARC}}$.

Automaton Figure 5.449 depicts the automaton associated with the not_in constraint. Let $\mathtt{VAL}_i$ be the val attribute of the i^{th} item of the VALUES collection. To each pair $(\mathtt{VAR}, \mathtt{VAL}_i)$ corresponds a 0-1 signature variable $\mathtt{S}_i$ as well as the following signature constraint: $\mathtt{VAR} = \mathtt{VAL}_i \Leftrightarrow \mathtt{S}_i$.

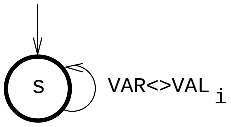

Figure 5.449: Automaton of the not_in constraint

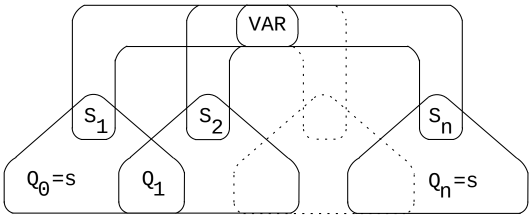

Figure 5.450: Hypergraph of the reformulation corresponding to the automaton of the not_in constraint