ERRATA FOR GENERALISED ARC CONSISTENCY FOR THE
ALLDIFFERENT CONSTRAINT: AN EMPIRICAL SURVEY

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1. FINDING SCCS AND REMOVING DOMAIN VALUES

In the description of Régin’s algorithm, there is an error in the pseudocode (algorithm 2 in the paper). In the case where a variable \( x_i \) is assigned to value \( a \) (and therefore matching \([i] = a\), \( x_i \) and \( a \) are not in the same SCC and the algorithm as it was presented would prune \( a \) from \( x_i \). Algorithm 1 shows the replacement pseudocode, with the correction on line 22: the extra condition matching \([i] \neq e\) is added.

This was an error only in the pseudocode, not in the implementation that was used for all the experiments and released as open-source (as part of Minion).

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Algorithm 1 FindSCCsRemoveValues

FindSCCsRemoveValues(matching, varSet): returns nothing
(1) visited ← ∅; TStack ← []; maxDFS ← 1; hasSCCSplit ← False
(2) for $x_i \in$ varSet:
(3) if $x_i \notin$ visited:
(4) TarjanRemoveValues($x_i$) // start search at $x_i$

TarjanRemoveValues(curnode): returns nothing
(1) TStack.push(curnode)
(2) DFSNum[curnode] ← maxDFS
(3) lowLink[curnode] ← maxDFS
(4) maxDFS ← maxDFS + 1
(5) visited.insert(curnode)
(6) for newnode ∈ neighbourhood(curnode):
(7) if newnode ∈ visited:
(8) if newnode ∈ TStack:
(9) lowLink[curnode] ← min(lowLink[curnode], DFSNum[newnode])
(10) else:
(11) TarjanRemoveValues(newnode)
(12) lowLink[curnode] ← min(lowLink[curnode], lowLink[newnode])
(13) if lowLink[curnode] = DFSNum[curnode]: // if curnode is the root of an SCC
(14) if lowLink[curnode] > 1 or DFS did not traverse all variables:
(15) hasSCCSplit ← True
(16) if hasSCCSplit:
(17) SCC ← ∅; stacknode ← null
(18) while stacknode ≠ curnode:
(19) stacknode ← TStack.pop()
(20) SCC.insert(stacknode)
(21) for $e \in$ SCC where $e \in \{1 \ldots d\}$: // $e$ is a domain value
(22) for $x_i \in$ varSet where $x_i \notin$ SCC and matching[$i$] ≠ $e$:
(23) removeFromDomain($x_i, e$)