

Input : $A, B : C_N$; \mathcal{T}_S : static, \mathcal{T}_D : dynamic

Output: minimal subset $S \subseteq \mathcal{T}_D$ such that $A \sqsubseteq_{\mathcal{T}_S \cup S} B$

- 1 If $|\mathcal{T}_D| = 1$ then return \mathcal{T}_D
- 2 $\mathcal{T}_1, \mathcal{T}_2 := \text{halve } \mathcal{T}_D$
- 3 If $A \sqsubseteq_{\mathcal{T}_S \cup \mathcal{T}_1} B$ then return $\text{extract-MinA}(A, B, \mathcal{T}_S, \mathcal{T}_1)$
- 4 If $A \sqsubseteq_{\mathcal{T}_S \cup \mathcal{T}_2} B$ then return $\text{extract-MinA}(A, B, \mathcal{T}_S, \mathcal{T}_2)$
- 5 $S_1 := \text{extract-MinA}(A, B, \mathcal{T}_S \cup \mathcal{T}_2, \mathcal{T}_1)$
- 6 $S_2 := \text{extract-MinA}(A, B, \mathcal{T}_S \cup S_1, \mathcal{T}_2)$
- 7 return $S_1 \cup S_2$

faulty variant of line 6: $S'_2 := \text{extract-MinA}(A, B, \mathcal{T}_S \cup \mathcal{T}_1, \mathcal{T}_2)$

Example-Call such that both variants differ:

$\text{extract-MinA}(A, D, \emptyset, \mathcal{T}_\epsilon)$

$\mathcal{T}_\epsilon := \{A \sqsubseteq B, C \sqsubseteq D, A \sqsubseteq C, B \sqsubseteq D\}$

halve $\mathcal{T}_\epsilon \rightarrow \mathcal{T}_1 := \{A \sqsubseteq B, C \sqsubseteq D\}, \mathcal{T}_2 := \{A \sqsubseteq C, B \sqsubseteq D\}$. $A \sqsubseteq D$ doesn't follow from $\emptyset \cup \mathcal{T}_1$ or $\emptyset \cup \mathcal{T}_2$

$S_1 := \text{extract-MinA}(A, D, \mathcal{T}_S = \{A \sqsubseteq C, B \sqsubseteq D\}, \mathcal{T}_D = \{A \sqsubseteq B, C \sqsubseteq D\}) \rightarrow \{A \sqsubseteq B\}$

$S_2 := \text{extract-MinA}(A, D, \mathcal{T}_S = \{A \sqsubseteq B\}, \mathcal{T}_D = \{A \sqsubseteq C, B \sqsubseteq D\})$. halve $\mathcal{T}_D \rightarrow \{A \sqsubseteq C\}, \{B \sqsubseteq D\}$, because of line 4 $\text{extract-MinA}(A, D, \{A \sqsubseteq B\}, \{B \sqsubseteq D\})$ is returned and we have $S_2 = \{B \sqsubseteq D\}$ (line 1)

$S'_2 := \text{extract-MinA}(A, D, \mathcal{T}_S = \{A \sqsubseteq B, C \sqsubseteq D\}, \mathcal{T}_D = \{A \sqsubseteq C, B \sqsubseteq D\})$. halve $\mathcal{T}_D \rightarrow \{A \sqsubseteq C\}, \{B \sqsubseteq D\}$, because of line 3 $\text{extract-MinA}(A, D, \{A \sqsubseteq B, C \sqsubseteq D\}, \{A \sqsubseteq C\}) = \{A \sqsubseteq C\}$ is returned.

The output is $S_1 \cup S_2 = \{A \sqsubseteq B, B \sqsubseteq D\}$ which is correct and $S_1 \cup S'_2 = \{A \sqsubseteq B, A \sqsubseteq C\}$ which is not correct because it is not a MinA. One can see that for the computation of S_2 , S_1 has to be a in the static part, because S_1 is already fixed as a part of the MinA (line 7).