Script generated by TTT

Title: Petter: Compiler Construction (18.06.2020) - 38: Example for Strong Acyclicity

Date: Thu Jun 18 11:26:15 CEST 2020

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Pages: 13

Subclass: Strongly Acyclic Attribute Dependencies

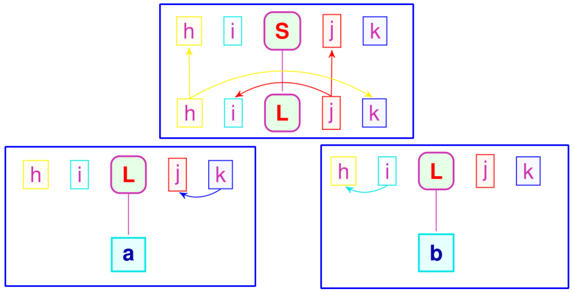
Strongly Acyclic Grammars

If all $D(p) \cup \mathcal{R}^\star(X_1)[1] \cup \ldots \cup \mathcal{R}^\star(X_k)[k]$ are acyclic for all $p \in G$, G is strongly acyclic.

Idea: we compute the least solution $\mathcal{R}^\star(X)$ of $\mathcal{R}(X)$ by a fixpoint computation, starting from $\mathcal{R}(X) = \emptyset$.

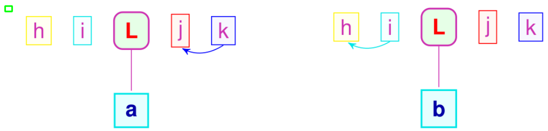
Example: Strong Acyclic Test

Given grammar $S \to L$, $L \to a \mid b$. Dependency graphs D_p:



Example: Strong Acyclic Test

Start with computing $\mathcal{R}(L) = [\![L \to a]\!]^\sharp() \sqcup [\![L \to b]\!]^\sharp()$:



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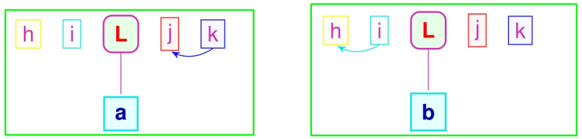

1. terminal symbols do not contribute dependencies check for cycles!
2. transitive closure of all relations in $(D(L\to a))^+$ and $(D(L\to b))^+$

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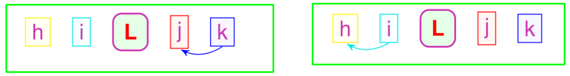

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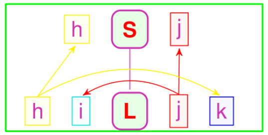

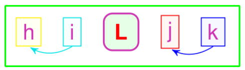

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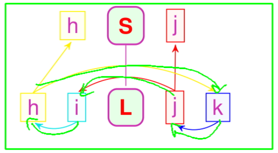

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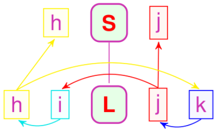

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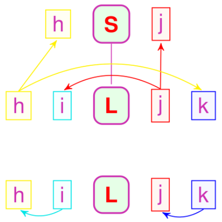

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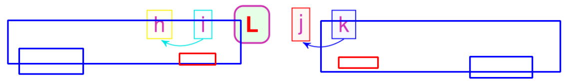

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