

3 Strictly Local stringsets

For each k , and each there is a canonical form for strictly k -local stringsets. Here it is.

Definition 4. Given the structure of the *canonical SL_k DFA* for $L(G)$ is a DFA such that

- $Q = \Sigma^{\leq k-1}$;
- Σ is the alphabet;
- $q_0 = \lambda$;
- $F = Q$; and
- For all $q \in Q, \sigma \in \Sigma, \delta(q, \sigma) = \text{succ}_{k-1}(q\sigma)$

Here is an example, where $\Sigma = \{a, b, c\}$ and $k = 2$. Observe that the language of this DFA is Σ^* .

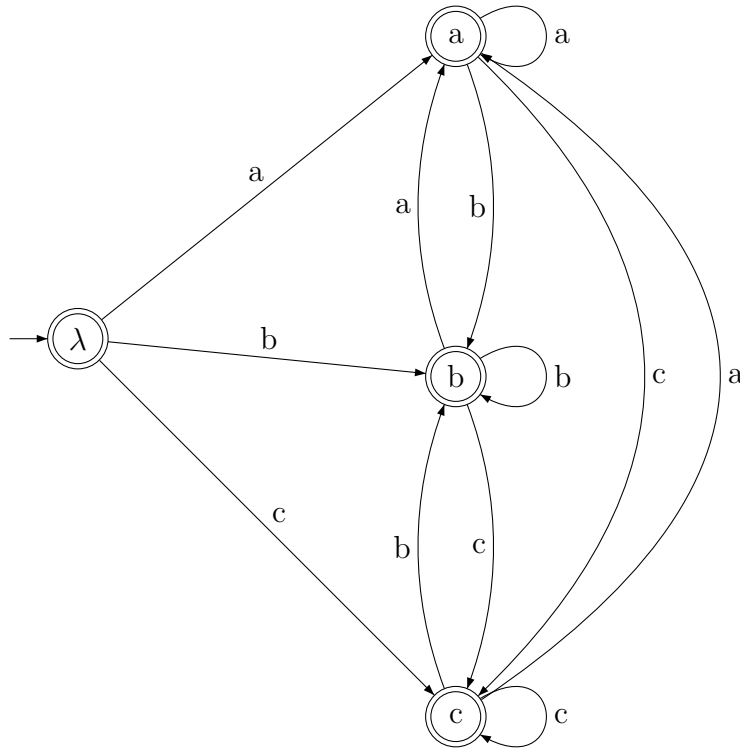


Figure 1: A canonical SL_2 DFA

Other SL_2 languages are obtained by removing transitions or making states non-final. In other words, every SL_2 stringset corresponds to some subgraph of this canonical DFA.

To see why, consider any strictly k -local grammar $G \subseteq \text{factor}_k(\{\times\}\Sigma^*\{\times\})$.

- For all $w \in \Sigma^*$: $w \in F$ iff $w\times \in G$ or $\times w\times \in G$.
- For all $wa \in \Sigma^*$: $\delta(w, a)$ exists iff $wa \in G$ or $\times wa \in G$.