







Prompt Runtime Enforcement

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A Appendix (A run of Algorithm 1)

We illustrate the behavior of Algorithm 1 for the property specified by \mathcal{A} in Example 1 of the main paper, for promptness $k = 2$, and for a given input word $w = bcaba$ produced by the system. This example illustrates how the algorithm edits w in order to enforce $\mathcal{L}_\omega^2(\mathcal{A})$. Initially, $w_E = \varepsilon$, current state $q = q_0$, and $\text{cs} = 1$, since $q_0 \notin Q_F$. $Z^2 = \{q_2\}$, and $d_{Z^2}(q_0)$, $d_{Z^2}(q_1)$, $d_{Z^2}(q_2)$, $d_{Z^2}(q_3)$ and $d_{Z^2}(q_4)$ are 2, 1, 0, ∞ and ∞ respectively. In the first iteration of the while loop, $\sigma = b$, $q = q_0$, and $(\delta(q, a), \delta(q, b), \delta(q, c)) = (q_0, q_1, q_3)$, and $\text{surplus}(w \cdot a) = \text{surplus}(w \cdot b) = \text{surplus}(w \cdot c) = 2$, and $d_{Z^2}(q_1) + 2 < d_{Z^2}(q_0) + 2 \leq 3$. The set \mathcal{F} is computed as $\{a, b\}$, and since $\sigma = b \in \mathcal{F}$, the action remains unchanged, and transition $\delta(q_0, b) = q_1$ is taken to update the current state, and $\sigma' = b$ is appended to the word w_E . In the second iteration, $\sigma = c$, $q = q_1$, and $(\delta(q, a), \delta(q, b), \delta(q, c)) = (q_1, q_1, q_2)$, and $\text{surplus}(w \cdot a) = \text{surplus}(w \cdot b) = \text{surplus}(w \cdot c) = 3$, and $d_{Z^2}(q_1) + 3 \not\leq 3$ while $d_{Z^2}(q_2) + 3 \leq 3$. Now $\mathcal{F} = \{c\}$. Since $\sigma = c \in \mathcal{F}$, $\sigma = c$ remains unchanged. The current state is updated to q_2 , and $w_E = bc$. The iteration continues with upcoming events in sequence a and b which also remain unchanged. In the fifth iteration, $\sigma = a$, $q = q_1$, and $(\delta(q, a), \delta(q, b), \delta(q, c)) = (q_1, q_1, q_2)$, and $\text{surplus}(w \cdot a) = \text{surplus}(w \cdot b) = \text{surplus}(w \cdot c) = 3$, and $d_{Z^2}(q_1) + 3 \not\leq 3$ while $d_{Z^2}(q_2) + 3 \leq 3$. Now $\mathcal{F} = \{c\}$. $\sigma = a \notin \mathcal{F}$, and therefore $\sigma' = c$ is chosen from \mathcal{F} , and the current state transitions to q_2 . We can see that the word $bcaba \notin \mathcal{L}_\omega^2(\mathcal{A})$ is edited to $bcabc \in \mathcal{L}_\omega^2(\mathcal{A})$.