Formale Baumsprachen

Task 6 (universal algebra)

(a) Show that the mapping sub (restricted to T_Σ) is a homomorphism. Start by giving the target algebra.

(b) Show that the principle of proof by structural induction is correct by applying concepts from universal algebra.

Task 7 (bu-det fta)

Let $\Sigma = \{\sigma^{(2)}, \alpha^{(0)}, \beta^{(0)}\}$ and $\Delta = \{\sigma^{(2)}, \gamma^{(1)}, \alpha^{(0)}\}$ be ranked alphabets. Give deterministic bu-ta $\mathcal{A}_1$, $\mathcal{A}_2$, and $\mathcal{A}_3$ that recognize L_1, L_2, and L_3, respectively, where

(a) $L_1 = \{\xi \in T_\Sigma \mid \xi \text{ contains at least one } \alpha \text{ and one } \beta\}$,

(b) $L_2 = \{\xi \in T_\Sigma \mid \xi \text{ contains an even number of } \alpha \text{ symbols}\}$, and

(c) $L_3 = \{\sigma(t_1, \sigma(t_2, ...\sigma(t_n, \alpha)...)) \in T_\Delta \mid n \in \mathbb{N}, t_1, ..., t_n \in T_{\{\gamma^{(1)}, \alpha^{(0)}\}}\}$.

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