

Formale Übersetzungsmodelle

Task 12 (BOT \subseteq REL \circ FTA \circ HOM)

Let $\Sigma = \{\sigma^{(2)}, \gamma^{(1)}, \alpha^{(0)}\}$. Consider the bu-tt $M = (\{q_0, q_1, p\}, \Sigma, \Sigma, \{q_0\}, R)$, where R is given by:

$$\begin{array}{lll} \alpha \rightarrow q_0(\alpha), & \gamma(p(x_1)) \rightarrow p(\gamma(x_1)), & \sigma(q_0(x_1), p(x_2)) \rightarrow q_1(\sigma(x_2, x_1)), \\ \alpha \rightarrow p(\alpha), & & \sigma(q_1(x_1), p(x_2)) \rightarrow q_0(\sigma(x_1, x_1)). \end{array}$$

- (a) Describe $\tau(M)$.
- (b) Construct, according to the decomposition result from the lecture, a relabeling M_1 , an fta M_2 , and a homomorphism M_3 such that $\tau(M) = \tau(M_1) \circ \tau(M_2) \circ \tau(M_3)$.
- (c) Illustrate the transformation $\tau(M_1) \circ \tau(M_2) \circ \tau(M_3)$ with the input tree $\sigma(\alpha, \gamma\alpha) \in T_\Sigma$.

Task 13 (BOT \subseteq QREL \circ HOM)

- (a) Sketch the construction of the qrel in the proof of BOT \subseteq QREL \circ HOM.
- (b) Apply this construction to the bu-tt given in Task 12, i.e. give a qrel M'_1 and a homomorphism M'_2 such that $\tau(M) = \tau(M'_1) \circ \tau(M'_2)$.