Exercise 11 (Regular tree grammars)
1. Let $\Sigma = \{\sigma^{(2)}, \gamma^{(1)}, \alpha^{(0)}\}$. Give an rtg in normal form which generates the language $L = \{\xi \in T_\Sigma | \xi \text{ contains exactly one } \sigma\}$.

2. Let $G = (N, \Sigma, Z, P)$ be an rtg with $N = \{Z, A, B, C\}$, $\Sigma = \{\sigma^{(2)}, \alpha^{(0)}, \beta^{(0)}\}$, and $P = \{Z \rightarrow \sigma(\sigma(A, B), C), Z \rightarrow B, A \rightarrow \alpha, A \rightarrow B, B \rightarrow \beta, B \rightarrow A, B \rightarrow C, C \rightarrow C\}$. Use the construction from the lecture to give a regular tree grammar in normal form equivalent to $G$.

Exercise 12 (Final-state normal form)
1. Use the construction from the lecture to give a bu-ta in final-state normal form equivalent to the one in Exercise 9(1).

2. Prove or refute: There is a det. bu-ta in final-state normal form equivalent to the bu-ta in Exercise 9(1).

Exercise 13 (Relatedness)
1. Give a bu-ta which is related to the regular tree grammar from Exercise 11(1).

2. Give a regular tree grammar which is related to the bu-ta from Exercise 12(1).

3. Define a suitable notion of relatedness between td-ta (deterministic or nondeterministic) and regular tree grammars in normal form.