

Formal Languages and Complexity

Proseminar

Week 13 [10.1.2017 /11.1.2017]

Task 1 Give a context-free grammar for the language over $\Sigma = \{(,)\}$ of well-formed (properly nested) parenthesis. Note that a word belongs to this language if the number of closed parenthesis never (in any prefix) exceeds the number of open ones and at the end of the word these numbers are the same.

Task 2 Show that the language L of palindromes over alphabet $\Sigma = \{a, b\}$ is context-free. Note that

$$L = \{w \in \{a, b\}^* \mid w = w^R\}.$$

Task 3 Construct a context-free grammar for the language

$$L = \{a^i b^j c^k \mid i = j \text{ or } j = k\}.$$

Notice that the language is a union of two context-free languages.