

Seminar 5

Exercise 1. Give context-free grammars generating the following languages.

1. $\{a^n b^n \mid n \geq 0\}$
2. the language over $\{ "[", "]" \}$ made of all well-paranthesized strings
3. $\{w \in \{a, b\}^* \mid w = w^R\}$, where w^R is the reversal of w
4. $\{ww^R \mid w \in \{a, b\}^*\}$, where w^R is the reversal of w
5. $\{w \in \{a, b\}^* \mid |w| \text{ is even}\}$
6. $\{w \in \{a, b\}^* \mid |w|_a = |w|_b\}$, where $|w|_x$ is the number of occurrences of the character x in the word w .
7. $\{w \in \{a, b\}^* \mid |w|_a = |w|_b\}$.