

Formal Languages and Automata Theory, SS 2020. Homework 3 (due Week 4)

1. Consider the languages generated by the grammars from Homework 1, Exercise 2, languages a, b, c, d . Let L_a, L_b, L_c, L_d be these languages, respectively. Find grammars which generate the languages $L_a \cup L_b, L_c \cup L_d, L_a L_b, L_c L_d, L_a^*, L_c^*$.
2. Devise grammars generating the following languages:
 - (a) $L = \{\lambda\}$
 - (b) $L = \emptyset$
 - (c) $L = \{0^n | n \in \mathbb{N}\}$
 - (d) $L = \{a^i b^j a^i b^j\}$
 - (e) $L = \{awbbw' | w, w' \in \{0, 1\}^*\}$
 - (f) $L = \{w | w \text{ real constant in C programming language}\}$
 - (g) $L = \{w \in \{0, 1\}^* | w \text{ contains maximum 2 zeros}\}$
 - (h) $L = \{wa\tilde{w} | w \in \{0, 1\}^*\}$
 - (i) $L = \{w | w \text{ is a byte representing an even number}\}$
 - (j) $L = \{A, B, \dots, Z\}$