Formal Languages and Automata Theory, SS 2017. Homework 5 (due Week 11, respectively 12)

0. Write context-free grammars for the following languages:

   (a) $L = \{w | w \text{ is a binary palindrome}\}$

   (b) $L = \{$ the language of balanced paranthesis $\}$
   Examples: ()((((()))(((()))), ((((()))()()); *Counterexamples:* (((((())))(((()))), ((((()))))())

   (c) $L = \{0^m 1^n | m \geq n\}$

   (d) $L = \{0^n 1^n | n \geq 1\}$ *Examples:* 01, 00001111

   (e) $L = \{0^n 1^n | n \geq 0\}$ *Examples:* λ, 01, 00001111

   (f) $L = \{$ The set of all strings with an equal number of a's and b's$\}$
   Examples: λ, *aabb*, *bbaa*, *abbababa*,*bbababaa*. (Bonus: 0.25 points)

   (g) $L = \{$ Binary words with even length$\}$

   (h) $L = \{0^i 1^j 2^k | i = j \text{ or } j = k, \text{ where } i, j, k \geq 0\}$ (Bonus: 0.25 points)

   (i) $L = \{a^i b^j c^k | i + j = k, i, j, k \geq 0\}$ (Bonus: 0.25 points).