
CS 374 LAB 7: CONTEXT-FREE LANGUAGES

Date: February 7, 2018.

Problem 1. [Category: Design] Prove that every regular language is context-free.

Problem 2. [Category: Design+Proof] Design context-free grammars for the following languages.

1. $L_1 = \{a^n b^m \mid n \neq m\}$.
2. $L_2 = \{a^i b^j c^k \mid i = j \text{ or } j = k\}$.
3. $L_3 = \{a^i b^j c^k \mid i \neq j \text{ or } j \neq k\}$.
4. $L_4 = \{a, b\}^* \setminus \{a^n b^n \mid n \geq 0\}$.
5. $L_5 = \{xy \mid x, y \in \{0, 1\}^*, |x| = |y|, \text{ and } x \neq y\}$.