CS21004 - Tutorial 6

February 14th, 2019

Instructions: For the problems with (To submit), please write the answers neatly in loose sheets and submit to the TA before the end of the tutorial.

1. Provide Context Free Grammars (CFGs) for the following languages:
   a. $L_1 = \{a^i b^j c^k | i, j, k \geq 0 \text{ and } i = j \text{ or } j = k\}$
   b. $L_2 = \{a^{i_1} b^{i_1} a^{i_2} b^{i_2} \dots a^{i_n} b^{i_n} | n, i_1, i_2, \dots, i_n \geq 0\}$
   c. $L_3 = \{0^i 1^j 2^k | k \leq i \text{ or } k \leq j\}$
   d. $L_4 = \{ww^R | w \in \{0,1\}^*\}$
2. Use Myhill-Nerode theorem to prove non-regularity for the following languages:
   a. L_5, where L_5 is the language of palindromes over $\{a, b\}$
   b. $L_6 = \{uu^R v | u, v \in \Sigma^+\}$