

CSCI 2400 – Models of Computation

Homework 7

Due: Thursday March 17 in class

Problem 1. Show that the family of context-free languages is not closed under symmetric difference Δ . (symmetric difference of two sets is a set whose elements are either one of the two sets but not in both.) That is, for any two context-free languages L_1 and L_2 , $L_1 \Delta L_2$ is not necessarily context-free.

Problem 2. Show that if L_1 is not a context-free language and L_2 is finite, then $L_1 - L_2$ is not a context-free language.

Problem 3. Show that the following language is context-free.

$L = \{w \in \{a, b\}^* : n_a(w) = n_b(w), w \text{ does not contain substring } \text{babb}aa\text{abbbb}\}$