CSCI 2400 – Models of Computation

Homework 6

Problem 1 (Conversions of grammars and PDAs).

(a) Convert the following grammar to a PDA (draw the resulting PDA) using the procedure described in class.

\[
S \rightarrow AA | a \\
A \rightarrow bSA | bb
\]

(b) Do problem 15 in the text book - Page 194. The book uses the symbol $ in place of symbol $ used in class.

Problem 2 (Properties of CFL languages).

(a) Show that the intersection of a deterministic context-free language and a regular language is a deterministic context-free language.

(b) Give an example to show that unambiguous context-free languages is not closed under intersection.

(c) Show that the following language is context-free:

\[
L = \{ w \in \{a,b\}^* : n_a(w) = n_b(w), \ w \text{ does not contain the substring } abba \}.
\]