CSCI 311/500 Models of Computation
Self Test 6

1. Draw an nfa for the regular expression: \((aba)^* + (b^*a)^*\)

2. Draw an nfa for the following right-linear grammar for the language \(L\):

\[
\begin{align*}
S & \rightarrow bS \mid aA \mid \lambda \\
A & \rightarrow aA \mid bB \mid b \\
B & \rightarrow bS
\end{align*}
\]

3. Give an English description of the language accepted by the following regular expression:

\[b^*(ab(ab^*)^*ab^* + a^*(ba^*b^*)^*ba^*)\]

4. Consider the language \(L\) defined on \(\{a, b\}\) where every \(a\) is followed by \(bb\).
   
   (a) Draw an nfa for \(L\).
   
   (b) Write a regular expression for \(L\).
   
   (c) Write a regular grammar for \(L\).

5. Consider the language \(L_2\) defined by the regular expression: \(aa^*b + b\).
   
   (a) Construct a DFA for \(L_2\).
   
   (b) Give a right-linear or left-linear grammar for \(L_2\).

6. Find a regular grammar that generates the language on \(\Sigma = \{a, b\}\) consisting of all strings with no more than three \(a\)’s.