Construct npda’s that accept the following languages. Write down either the quintuples that describe the npda or use JFLAP. Be sure to test that you npda works

1. \( L_1 = \{ wcw^R \mid w \in \{a,b\}^* \} \)

2. \( L_2 = \{ a^k b^m c^n \mid k + m = n \} \)

3. \( L_3 = \{ w \mid w \in \{a,b\}^+ \text{ and } n_a(w) = n_b(w) \} \); i.e. the number of a’s = number of b’s

Test Cases for Top Down Parser Project (Due F 3/7/2014) : Hand in 9 Cases

A. Grammar: \( S \rightarrow SS \mid aSb \mid ab \) Productions 0 - 2

Test the following strings:

1. aabbabab
2. abaabbab
3. aabbabba

B. Grammar \( E \rightarrow E+E \mid E*E \mid (E) \mid I \) Productions 0 - 3
\( I \rightarrow a \mid b \mid c \) Productions 4 - 6

Test the following strings

1. a+b*c
2. (a+b)*c
3. (a+b)*c

C. Grammar \( S \rightarrow aSb \mid aAa \mid bAb \) Productions 0 - 2
\( A \rightarrow aAa \mid bAb \mid aa \mid bb \) Productions 3 – 6

Test the following strings

1. abbaabbb
2. aaaaababb
3. aabaabbb