CSE 322: Introduction to Formal Models in Computer Science
Assignment #6
November 16, 2005
due: Wednesday, November 23

1. Let $\Sigma = \{a, b, \#\}$. Give a pushdown automaton for the language

$$\{u\#v \mid u, v \in \{a, b\}^* \text{ and } v^R \text{ is a substring of } u\}.$$

   v^R denotes the reversal of the string v. You should specify the transition function by giving the state diagram. You need not turn in a proof of correctness, though it would be good reassurance for yourself to do such a proof.

2. Give a pushdown automaton for the language

$$\{a^m b^n \mid n \leq m \leq 2n\}.$$

   You should specify the transition function by giving the state diagram. You need not turn in a proof of correctness, though it would be good reassurance for yourself to do such a proof.

3. Use the procedure of Lemma 2.21 [1st Ed: Lemma 2.13] to convert the grammar G_3 of Example 2.3 [1st Ed: Example 2.2] into an equivalent pushdown automaton M. You may use the shorthand allowing the automaton to push more than one symbol in a single step in your state diagram. Show an accepting computation of M on the input *aababb*, together with the corresponding derivation of this string in G_3.