CS3311 Homework 11 Due date: Wednesday, December 5, 2012, in class

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The answers must be the original work of the author. While discussion with others is permitted and encouraged, the final work should be done individually. You are not allowed to work in groups. You are allowed to build on the material supplied in the class. Any other source must be specified clearly.

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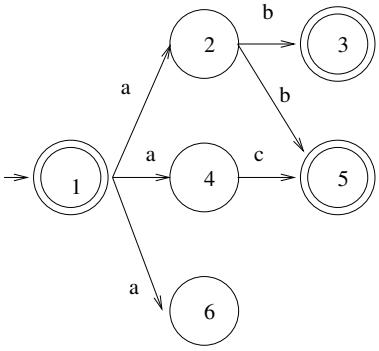
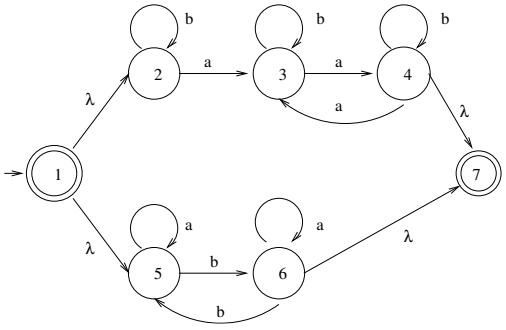
1. *(20 points)* Let M_1 be the following NFA:



a. Give the transition function t for M_1 in tabular form.

b. Use algorithm 5.6.3 to construct a state diagram of a DFA that is equivalent to M_1. Give the input transition function and draw the state diagram of the equivalent DFA.

2. *(20 points)* Let M_2 be the following NFA-λ:



a. Give the transition function t for M_2 in tabular form. Include a column for the λ-closure of each state.

b. Use algorithm 5.6.3 to construct a state diagram of a DFA that is equivalent to M_2. Give the input transition function and draw the state diagram of the equivalent DFA.

Please turn the page over.

3. *(10 points)* Let M be the PDA in Example 7.1.3 on page 226 (the one for even length palindromes). Show the computation trees for the strings $baab$ and bab.

4. *(30 points)* Construct PDAs that accept each of the following languages. Explain how you construct the PDA.

a. $\{a^i b^j \mid 0 \leq i \leq j\}$

b. $\{a^i b^j c^k \mid i + k = j\}$

5. *(20 points)* Let M be the TM in Example 8.2.2 on page 261 (the machine for $a^i b^i c^i$). Show the computation sequence for the strings abc and $aabc$.