5 Homework

Due: Wednesday, October 24, 2007.

Instructions

- Please, review the homework grading policy outlined in the course information page.
- On the *first page* of your solution write-up you *must* make explicit which problems are to be graded for regular credit, whic problems are to be graded for extra credit, and which problems you did not attmept. Use a table that looks like this:

Problem	1	2	3	4	5	6	7	8	9	...
Credit	RC	RC	RC	EC	RC	EC	NA	NA	EC	...

  where "RC" denotes "regular credit", "EC" denotes "extra credit", and "NA" denotes "not attempted". Failure to include such a table will result in an arbitrary set of problems being graded for regular credit, no problems being graded for extra credit, and a 5% penalty assessment.
- You must also write down with whom you worked on the assignment. If this varies from problem to problem, write down this information separately with each problem.

Problems

Required: 4 of the following 5 problems
Points: 25 points per problem

1. (Problem 5 from the previous assignment.)

   Convert each of the CFGs below to an equivalent PDA, using the procedure given in Theorem 2.20 and the following proofs:

   (a) The grammar from the Problem 2.4 (e)

   (b) The grammar from the Problem 2.6 (b)

2. Give both an informal description and a state transition diagram for a PDA that recognizes the language:

   $\{a^i b^j c^k | i, j, k \geq 0 \text{ and } i = j \text{ or } j = k\}$

3. Give both an informal description and a state transition diagram for a PDA that recognizes the language over the alphabet $\{0, 1, \#\}$ given by

   $\{x\#y | x, y \in \{0,1\}^+ \text{ and } |x| \leq |y| \text{ and the } n^{th} \text{ symbol matches the } n^{th} \text{ symbol of y, where } n = |x|\}$

4. Do Problem 2.20

5. Do Problem 2.25