

CSE625: Introduction to Formal Languages – Homework 7

Due: June 1st, 2009 (Mon) in class. No late homework is accepted.

Note: The TA might only grade a subset of the homeworks.

Problem 1: [10 pts] Exercise 7.4 in the textbook.

Problem 2: [24 pts] Exercise 7.5 (b), (c), and (d) in the textbook.

Problem 3: [10 pts] Give transition tables for a PDA recognizing the following language:

$$\{ x \in \{a, b, c\}^* \mid \text{the number of } a\text{'s equal to twice the number of } c\text{'s} \}.$$

Problem 4: [6pts] Give a *PUSHDOWN AUTOMATON* (possibly non-deterministic) which accepts the language generated by the context-free grammar $\langle \{S, X, Y, Z\}, \{a, b\}, S, P \rangle$ where the production rules P are:

$$\begin{array}{ll} S \rightarrow aXb & Y \rightarrow ZbZ \\ S \rightarrow bXY & Y \rightarrow \Lambda \\ X \rightarrow a & Z \rightarrow SS \\ X \rightarrow aZ & Z \rightarrow aY \end{array}$$