

COMS W3261: Theoretical Computer Science.

Instructor: Tal Malkin

Problem Set 6

Due: Thur, 03/12/09. **No late homework will be accepted.**

Reading: Chapter 2.2, 2.3

1. Problem 2.44 in text (proving that if A,B are regular, then $A \diamond B$ is context free).
2. Problem 2.11 in text (converting a CFG to a PDA).
3. Prove that the following languages are not context free:
 - (a) $L_1 = \{w \in \{1, 2, 3, 4\}^* \mid \text{in } w \text{ the number of 1s equals the number of 2s, and the number of 3s equals the number of 4s}\}$.
 - (b) $L_2 = \{a^{n^2} \mid n \geq 0\}$ over $\{a\}$.