CS381 Fall 2001 – Homework 5
Prof Shai Ben-David

DUE: Monday, November 5 , 9:05 am

NOTE: EVERY claim you make should be supported by an explanation or a proof

1. Given any CF grammar $G=(\Sigma, N, S, P)$, construct a grammar G' such that

$$L(G') = \{\overline{w} : w \in L(G)\}$$

(where for a word $w=\sigma_1 \ldots \sigma_n$, $\overline{w}$ is its reverse $\sigma_n \ldots \sigma_1$).

2. Construct a PDA, M, such that

$$L(M) = \{0^l 1^k : k \leq l \leq 2k\}$$

3. Prove that $\{w\overline{w}w : w \in \{0,1\}^*\}$ is not a CFL ($\overline{w}$ is the reverse of w).

4. Prove that if L_1 is a CFL and L_2 is a regular language, then $L_1 \cap L_2$ is a CFL.