

CIS 262 Fall 2009: Homework 4, Due November 5

Please write your answers succinctly and rigorously. Submit the homework by 12noon on November 5, no late extension is possible.

1. Exercise 6.2.5 from textbook (it's the same exercise in both editions 2 and 3). 10pts
2. Draw a PDA P such that $L(P) = \{0^i 1^j 2^k \mid j = i + k\}$. Explain your construction. 10pts
3. Let $\Sigma = \{a, b, \#\}$. Draw a PDA P such that $N(P) = \{u\#v \mid u, v \in \{a, b\}^*, u \neq v\}$. That is, P should accept (by empty stack) all words that contain exactly one $\#$ symbol and the word before $\#$ is *not* equal to the word following $\#$. Explain your construction. 15pts
4. Prove that the following language is not a CFL using the pumping lemma for CFLs: 15pts

$$\{ 0^m 1^n \mid n = m^2 \}$$