COMP 150-EFL—Experimenting with Formal Languages—Spring 2012

Problem Set 6

Due by 4:30 p.m. on Wednesday, April 18

Problem 1 (20 points)

Let G be the grammar

$$\mathsf{A} \to \mathsf{A0A} \mid \mathsf{A1A} \mid \mathsf{2} \mid \mathsf{3A4}.$$

Prove that $L(G)$ is not regular.

Problem 2 (15 points)

Let H be the grammar

$$\begin{aligned} \mathsf{A} &\to \mathsf{B} \mid \mathsf{B0A}, \\ \mathsf{B} &\to \mathsf{C} \mid \mathsf{C1B}, \\ \mathsf{C} &\to \mathsf{2} \mid \mathsf{3A4}. \end{aligned}$$

Use Forlan to provide strong evidence for the equivalence of G and H.

Problem 3 (35 points)

Prove that G and H are equivalent.

Problem 4 (30 points)

Prove that H is unambiguous.