Homework 4
CIS 770: Formal Language Theory

Assigned: Feburary 26, 2016 Due on: March 8, 2013

Instructions: This homework has 2 problems that can be solved individually. Please follow the homework guidelines given on the class website. Solutions not following these guidelines will not be graded.

Recommended Reading: Lectures 8, 9, 10 and 11.

Problem 1. [Category: Comprehension+Design] Let $L = \mathbf{L}(1^*0(00 \cup 01 \cup 1)(0 \cup 1)^*)$.

1. List all the suffix languages of L, explain why your answer covers all the suffix languages. **[5 points]**
2. Draw the minimum state DFA M^L accepting L. **[5 points]**

Problem 2. [Category: Comprehension] Given a homomorphism $h : \Sigma^* \to \Delta^*$ and a language $L \subseteq \Sigma^*$ define $h(L) = \{h(w) | w \in L\} \subseteq \Delta^*$.

1. Pove that for all strings $x, y \in \Sigma^*, h(xy) = h(x)h(y)$. **[5 points]**
2. Prove $h(L_1 \cup L_2) = h(L_1) \cup h(L_2)$. **[5 points]**
3. Proof $h(L_1 \circ L_2) = h(L_1) \circ h(L_2)$. **[5 points]**