

# CS 311: Computational Structures

## Problem Set 1

James Hook

Prepared: September 27, 2015  
Due: October 6, 2015

1. Sipser 0.7, all three parts (relations that have two but not three of the characteristic properties of equivalence relations). Note: part c is significantly more subtle than parts a and b.
2. Sipser 1.6, parts b,c,f,k. Construction of DFAs.
3. Sipser 1.31. Regular languages closed under reverse.
4. Sipser 1.34. Greater than is regular given specified representation.
5. Construct a DFA that accepts binary strings that represent numbers congruent to 2 mod 3, that is  $\{n | n = k * 3 + 2 \text{ for some integer } k\}$ . For example: 2, 5, 8, ..., which are represented in binary as 10, 101, 1000, ... You may assume that  $\epsilon$  represents 0.