CS/Math 240: Intro to Discrete Math 5/8/2011

Grading Key for Homework 10

Instructor: Dieter van Melkebeek

Problem 1 (10 points)

Each part carries 2 points

Problem 2 (6 points)

Problem 3 (11 points)

Each part carries 2.75 points

Problem 4 (8 points)

Problem 5 (5 points)

Extra Credit (10 points)

Common Mistakes

- For problem 3a, you need to describe well-defined transitions between the states.
- For problem 3b, you need to argue the given statement for ANY finite automata and not just for the one constructed in part 3a.
- For probelm 3d, a common mistake while constructing equivalence classes was to have the classes 1, 2, 3, 4, 5, 6 mod k. This ignored the states due to the requirement of no leading zeroes, corresponding to ϵ, 0, and $0\{0,1,2\}*$; and the equivalence of some of the previously mentioned states.
- In problem 4, a fair amount of people correctly defined the states of a potential finite automaton as those representing different subsets of the alphabet; however, you also need to include an argument for why none of these states can be combined (in other words, why this is minimal).
- For the NFA in problem 4, a number of people had a $(k+1)$-state machine that simply transitioned in a straight path, with each vertex having a self loop, and all transitions for every letter in the alphabet. Only the final state was defined as not accepting. This machine is incorrect it accepts all the strings, which is not what is required.