CSCI 48400
Assignment 2

Due Wednesday, 9/08/21

Again, there are three types of problems. Please remember to collect all your JFLAP files, appropriately named, into a single zip file and submit it via Canvas.

I. Pencil and paper work from the textbook (i.e., scan your work and submit as a pdf file) (for instructor)

Section 2.3 #7, 8

Section 2.4, do the Exercise given in Commentary 0, Section 2-4 algorithm.pdf (you can do this in JFLAP but you won't have the benefit of JFLAP on a test, so do this by hand)

Extra Credit (5 points). Perhaps the dfa of Figure 2.16, which was obtained from the nfa of Figure 2.14, could be reduced. Use the dfa minimization algorithm to reduce the dfa in Figure 2.16 or to prove that it is irreducible. In table form, the dfa of Figure 2.16 looks like this (here the table uses simpler names for the states, namely states 0-6; use these names in your work.)

Present state	Next	state	Output
	Present	input	
	0	1	
0 = {q0}	1	2	0
1 = {q0.q1}	3	4	1
2 = {q1}	5	5	1
3 = {q0,q1,q2}	3	4	1
4 = {q1,q2}	5	5	1
5 = {q2}	6	5	0
6 = {}	6	6	0

I. Pencil and paper work from the textbook (i.e., scan your work and submit as a pdf file) (for TA)

Section 2.1 #10, 19

Section 2.2 #14 (Σ= {a})

Section 2.3 #4 (Probably easiest to draw a graph of the original nfa first. Then use the nfa-to-dfa algorithm; you can do this in JFLAP by just entering the nfa and using the Convert to DFA, but you actually want to understand the algorithm, so do this by hand.)

#14

II. Submit JFLAP files for the following problems from the textbook. Along with the zipped JFLAP files, please include one Word document with "snapshots" of all the JFLAP results, clearly labeled by problem number. (You can use PrintScreen, the Snipping Tool under Accessories in Windows, or any other screen capture software you may have.)

When you write JFLAP instructions for a finite-state machine, you are essentially writing a computer program. So you need to test that it is correct, just as you would test any other program you write. JFLAP is a great vehicle for testing your "code", so be sure to make good use of it for that purpose. Test both strings that should be accepted and strings that should not be accepted. If a given string doesn't work as expected, try loading that string using Input/Step by State, which will allow you to read and process the input string one character at a time and may help you see where it goes astray.

Section 2.2 in the JFLAP Activities.pdf describes how to use JFLAP to construct a dfa or nfa. (Also see the video posted on Canvas.)

JFLAP does not distinguish whether you want to create a dfa or an nfa, so be very careful if you want a dfa that you supply transitions for every state-input combination. Try to lay out your states in a nice way; you may have to move states around a little (select the Attribute editor, then drag states), to make all the transition labels readable. Also use state labels when needed for clarification (in the Attribute Editor, right-click on a state and use Change Label).

Section 2.1: #4c, 7c, 15

Section 2.2: #11a – read this problem as "Find an nfa with three (or fewer) states…"

III. Problems from the JFLAP Activities.pdf. Turn in the modified .jff files as part of your zip file.

Exercise 2.2 #1(a). Modify the Jexample2.5.jff file. [*Hint: this problem is a lot simpler than it first appears.*]

Exercise 2.2 #6. Modify the Jexercise2.6.jff file.