CS 310 Homework 6
DUE: Nov 21, 1pm

From the Book: p 159
Please type your answers and email them to me along with the JFLAP files below. The answers to these questions can be in the body of the email, they do not need to be in an attached document.

3.1 c
3.8 a, b
This question asks for an "implementation-level description." You need to specify the actions of the tape head (read/write/move) and how the transitions will take place, but not necessarily draw the state diagram. This is similar to how we specified TMs in class without drawing the full state diagram. Just specify, conceptually, how the TM operates. You may check your work in JFLAP but please type out your solution by hand.

Submit JFLAP files:

Please produce a PUNetID_cs310Hmwk6.tar.gz or .zip file containing the following JFLAP files and email it to me before 1pm on Nov 21. None of the following TMs should use the S (stationary) extension in JFLAP.

TM1_PUNetID.jff

Build a single tape, deterministic Turing Machine that accepts the language $\{ww^R | w \in \{0,1\}^*; |w| > 0\}$

TM2_PUNetID.jff

Build a single tape, deterministic Turing Machine that accepts the language $\{A^n B^n C^n | n > 0\}$

TM3_PUNetID.jff

Build a single tape, deterministic Turing Machine that accepts the language $\{A^{2*n} B^n C^{3*n} | n \geq 0\}$

BinAdd_PUNetID.jff

8-bit binary addition: Produce a 3-tape TM in JFLAP that will produce the sum on tape 3 of the 8-bit binary numbers given on tape 1 and tape 2. For example, if tape 1 contains: 00001111 (15) and tape 2 contains 00000011 (3) the sum on tape 3 should be: 00010010 (18). Don't worry about overflows. Each number on tape 1 and tape 2 will be exactly 8 bits long.

Bin2sComp_PUNetID.jff

8-bit binary complement: Produce a 2 tape TM that will produce the 2s complement on tape 2 of the 8-bit binary number on tape 1. The 2s complement is created by flipping each bit in the number and adding the value 1 to the resulting 8-bit number. For example, the 2s complement of 00001110 is 11110010