Due: Thursday, February 8

Reading: Chapter 3 in the Sipser textbook, pages 165-197.
If you get a chance take a look at the articles about computation that are mentioned as extra reading on the course homepage.

PROBLEMS
Part 1: These 4 problems are to be turned in and each will be graded (10 points each).

1. Describe a TM which accepts the language
   \[ L = \{ w2w^R | w \text{ is a string in } \{0,1\}^* \text{ and } w^R \text{ is the string } w \text{ in reverse order } \}. \]
   Here I mean informally describe how the TM works. You need not give the full program or diagram.
   We are looking for something like the description of the TM in examples 3.11 or 3.12 of the book on pages 174 and 175.

2. (i). Write a TM program which accepts the set of binary string with an even number of 1’s, rejects all binary string which have exactly one 1 and loops on all other binary strings.
   (ii). Write a TM program which decides the set \{ a, ba, acb \}. Your input alphabet should be \{ a,b,c \}.

   Note: You do not need to answer the last part of the question here. You should show that the Turing machine variant is not equivalent to the usual version, but you need not answer “What class of TM’s do these machines recognize? ”.

4. Problem 3.16, parts b and d.

Part 2: These problems are good practice and you should try them. They will not be graded

1. Exercise 3.1, parts b and c
2. Exercise 3.2, parts c and d
3. Exercise 3.5, all parts
4. Exercise 3.7
5. Problem 3.22