

CSCI 2400 – Models of Computation

## Homework 10

Due: Thursday April 8 in class

**Problem 1.** Show that there exists an infinite number of languages which are not accepted by Turing machines.

**Problem 2.** Describe an enumeration procedure that prints the strings of the following language in proper order:

$$L = \{x : x \in \{0, 1\}^*, \text{ and the most significant bit of } x \text{ is } 0\}$$

**Problem 3.** Let  $S_1$  be a countable set, and  $S_2$  a set which is not countable, and  $S_1 \subset S_2$ . Show that  $S_2$  must then contain an infinite number of elements that are not in  $S_1$ . Will the above be true even if  $S_2$  is countable? Explain