

CSE 2001: INTRODUCTION TO THE THEORY OF COMPUTATION
Assignment 4 (Released Nov 21, 2012)
Submission deadline: Nov 29, 2012

1. The assignment can be handwritten or typed. It MUST be legible.
2. You must do this assignment individually.
3. Submit this assignment only if you have read and understood the policy on academic honesty on the course web page. If you have questions or concerns, please contact the instructor.
4. Use the dropbox near the main office to submit your assignments.

Question 1

Describe a Turing Machine that accepts (decides) the non-context-free language $\{a^n b^n c^n | n \geq 0\}$. While you need not draw a state diagram, you should describe the machine in detail.

Question 2

Suppose Turing Machines T_1, T_2 compute the functions f_1, f_2 respectively. Describe how to construct a Turing Machine that computes the function $f_1 + f_2$.

Question 3

For each of the following decision problems, state whether the problem is decidable and prove your answer.

1. Given a TM T are there any input strings on which T loops forever?
2. Given a TM T are there any input strings not accepted by T ?