# Assignment 4

CSI 4336

Due October 2, 2018

## Submitting your assignment

All written portions of the assignment should be prepared in LaTeX.

Submit this assignment by the due date in two ways: by email (before class) and printed (at the beginning of class). Don't put any code in the printed copy. Proofread your document for style before submitting it.

Send the email to `hamerly@cs.baylor.edu` with the subject "CSI 4336 assignment X" (where X is the assignment number). The email should have one attachment (plain text, .zip, or .tar.gz format) containing:

- the .tex document you wrote named "lastname.tex" (where 'lastname' is your last name),
- a compiled .pdf from the .tex document named "lastname.pdf" (where 'lastname' is your last name),
- any additional files used in your LaTeX document, named "lastname_fig1.pdf" (or similar), and
- all source code used for any programs.

## 1 Textbook exercises (10 points each, 30 points total)

- Do problem 3.16 (c) from your textbook. Consider using nondeterminism. Give an algorithmic description (since algorithms are equivalent to Turing machines). Format the algorithm like the pseudocode in your book.
- Do exercise 4.7 from your textbook (note: this is 4.6 in the second edition).
- Do problem 4.13 from your textbook (note: this is 4.12 in the second edition). Give an algorithmic description (since algorithms are equivalent to Turing machines). Format the algorithm like the pseudocode in your book.

## 2 Accepting Cubes with a TM (20 points)

Do the problem 'baylor.tmcubes' on Kattis. This problem helps you understand the capabilities of the Turing Machine model. Use a restricted form of Java or C++ that is not too different from a Turing machine.

This problem has 'included code', hosted on Kattis, which you do not submit. You can see the included code in the attachments linked from the problem description. Kattis has the included code and compiles it in automatically. You submit a 'driver' which uses the included code.

For a little bit of extra credit, construct your program so it only uses one tape.