COMP 330 Winter 2021 Lecture 1

Prakash Panangaden

[1]School of Computer Science
McGill University

McGill University,Montréal, January 2021

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Welcome to COMP 330

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- My name: Prakash Panangaden

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- My name: Prakash Panangaden
- How should you address me?

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- **not** Prof. Prakash!!

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- **not** Prof. Prakash!!
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- but not "Your lordship."

Course Title

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Official Title

Theory of Computation

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TAs

1. Johanna Schwartzentruber
2. James Bodzay
3. Florestan Brunck
4. Qunji Sun
5. Roland Riachi
6. Lin Xiao Zheng
7. Yue Wu

Responsible for answering queries on the discussion group, office hours and helping with grading assignments, mid-terms and finals.

Course Administration

1. `cs.mcgill.ca/~prakash/Courses/330/comp330.html`
   Lecture notes, assignments and solutions will be posted there.

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8. Do not send me, or the TAs, messages through Facebook.

Grading

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- 6 assignments : 30%, submitted as pdf files through myCourses

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- 5 quizzes : 15% using the myCourses system.

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- 1 online midterm : 10% of your grade.

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Grading

- 6 assignments : 30%, submitted as pdf files through myCourses
- 5 quizzes : 15% using the myCourses system.
- 1 online midterm : 10% of your grade.
- Final exam online 3 hours: 45% of your total grade.
- Final exam, midterm and quizzes must be done by yourself without looking up solutions on the internet or discussing with your friends.

Finite state automata

- Basic mathematics and logic
- Deterministic finite automata, regular languages
- Nondeterministic finite automata
- Regular expressions
- Minimization
- The pumping lemma

Context-free languages

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- Grammars
- Pushdown automata

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- Parsing
- The pumping lemma for context-free languages

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Computability

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- Models of computation
- Undecidable problems

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- Reduction techniques
- Advanced topics

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The role of language

- We all speak natural language(s) with varying degrees of precision and accuracy.

The role of language

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- But sloppy use of language causes confusion in mathematics.

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- In order to train our minds we need to learn to speak carefully.

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- In mathematical discussions we need to use precise mathematical notation.
- The so-called "popular" books are more confusing than the real thing.
- Computers are **completely unforgiving!**
- In order to train our minds we need to learn to speak carefully.
- Every sentence has to be constructed with care.

English sloppiness that drives me crazy

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- Writing "can not" instead of "cannot": causes a real mistake in meaning.

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- Mistaking "that" and "which": sloppy but we usually understand.

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- Mistaking "that" and "which": sloppy but we usually understand.
- "I would like eggs and bacon or sausages." Ambiguity

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- "Dr. Lex Luthor is a former alumni of Gotham State."

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- "I would like eggs and bacon or sausages." Ambiguity
- "Dr. Lex Luthor is a former alumni of Gotham State."
- Clearly does not know what "alumnus" means nor what is the singular form. I saw this in a newspaper article.

Logical reasoning

Many of the problems students have **with this class** are caused by imprecise use of language. Please read the first handout that I wrote.