1.

Computer Science 320
Foundations of Computer Science

Prerequisites: C in CSCI 260
Math 123

Lectures: T, Th 1:00 – 2:30 210/240

Tutorial: 9^{30} or 10^{30} on Tuesdays

Text: Theory of Computation, Maheshwari & Smid

Intro to Theory of Computation Sipser any edition

Information Distribution

- not on D2L (VicuLearn)
- my web page for the course
  csci.viu.ca/~gpruesse/320/weekbyweek.html
- email

You can feel free to use the Discord channel for the course 320-2026-spring
I cannot be relied upon to visit it regularly....

How to be successful in the course:

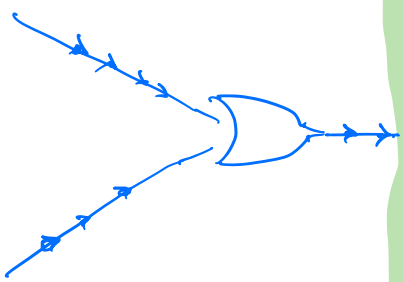
- it is mathy, and relies on concepts from Math 123
- relies on understanding recursion/induction
  So sharpen your skills
- it is either empty or full of programming, depending on your def^{n}.
- like most of your computer science courses, "mastering the material" is a matter of doing, not reading/listening (though you need to do that, too)
  - proving things
  - "programming" – coming up with FAs, r.e.s, PDAs, CFGs, TMs that meet requirements
- To get good at these things
  - come to tutorial! ← starts Tuesday Jan 13
  - attend class
  - ask questions
  - work on problems with classmates
  - talk to Help Centre staff:

What is a computer?

What "world" (epistemology) does it reside in?

Physical World

- laws of physics
  + physical objects



Mathematical World

- laws of logic
  (eg Modus ponens)
  + whatever we define
  ↳ "1", succ(1), "0"

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if a ∨ b then {
    ~
}
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Social World

Spiritual World

Moral / Ethical World

A thing that makes our time in history super interesting is that we have marshalled the physical world to do our mathematical-world stuff for us...

> The whole point of the physical computer is to do logic stuff for us.
>
> A physical computer is the reification of a mathematical object.

But what mathematical object?

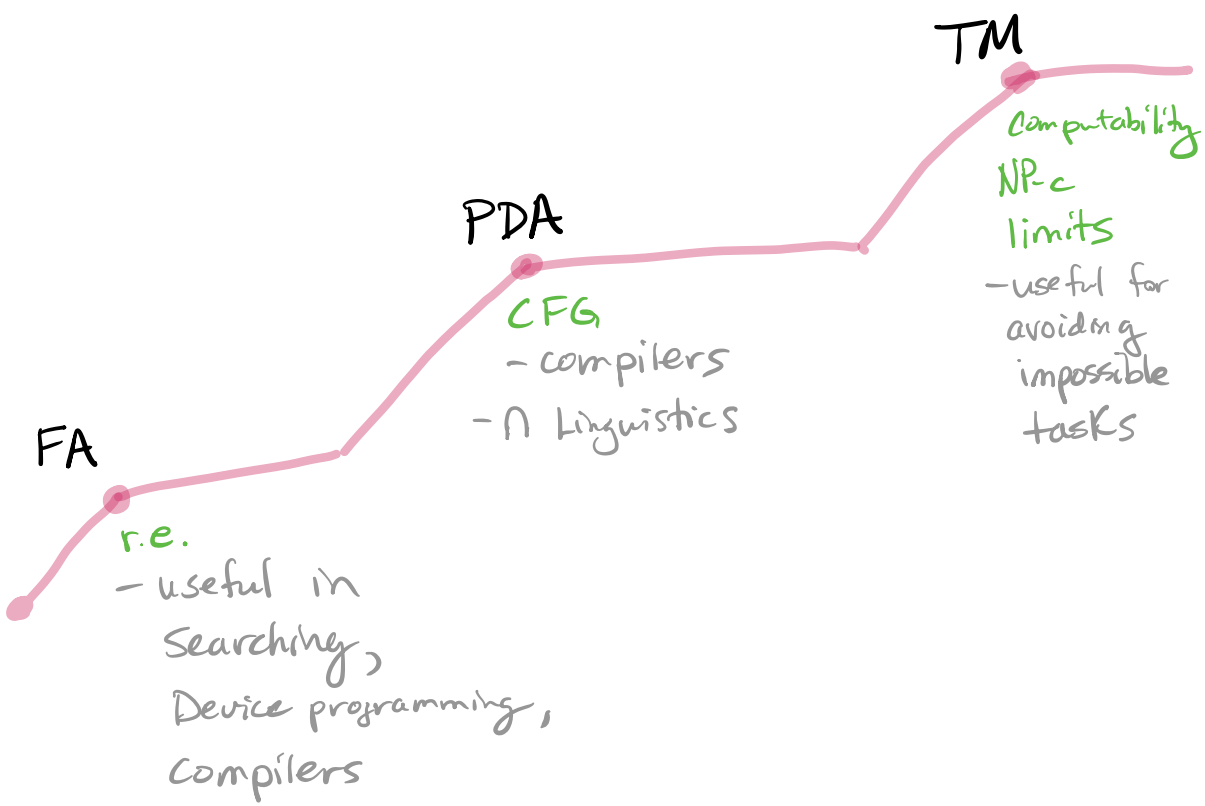
In this course, we explore mathematical objects that "do computation".

Ultimately, we come to a conclusion about what (mathematically speaking) a "computer" is (or what an "algorithm" is) and then proceed to PROVE STUFF about computation and algorithms.

Is this course practical or theoretical? Yes.

Stanford grads consistently rate this course (equivalent) as among the top 3 most useful courses they take.

- there are "spinoff" algorithmic rubrics that are applied in the CS world



Who am I?

Gara Pruesse
B.Sc. (UVic), M.Sc., Ph.D (U. Toronto)

Algorithms are my jam.

About Academic Integrity

Do talk to your classmates about problems, even Assignment problems.

Do – work in groups at a whiteboard

Do – read published solutions to similar problems to get ideas

– help your classmates to understand, if asked

Don't – have any materials produced by, or contributed to by, anyone else within eyesight when you construct your solution to hand in.

You can view textbooks and legitimate web materials while constructing your answer...

You can "work" together, but leave such meetings only with a changed brain (no other materials)

Homework (not to hand in) – by Tue

- Read Chapter 1, Maheshwari & Smid

- Do all the Chapter 1 problems that interest you, and come on Tuesday with your vote on which one is hardest i.e. that you are unsatisfied with your solution. We'll do some of them on Tue.

- p 81 – do all of question 2.1

Prepare to present your solution on Tue

1.1 Anmol
1.2 Austin
1.3 Yulia
1.4 Matt
1.5 Lucas
1.6 Dustin
1.7 Madeleine
1.8 Yagna
1.9 Kyle
1.10 Oleksii