COMPUTER SCIENCE

LESSON 1 : SEPTEMBER 7TH, 2017

INTRODUCTIONS

- Instructor: C. Woodford
- Email : woodford@cita.utoronto.ca
- Website : www.cita.utoronto.ca/~woodford
  - All the course material – assignments, notes, in-class examples, syllabus, helpful hints – will be available on the website for review and download.

- Let's talk about the course itself!

WHO, WHAT, WHY

- Let's get to know each other.
  - What grade are you in?
  - What prior experience do you have in CS? (Literally everything and anything)
  - Why are you in this class? What would you like to learn?
  - What are your goals for CS?

SET THE FOUNDATIONS

- You probably have a fairly good idea about what CS is, but we should really start at the beginning to appreciate the field and how far it's come.
- This week and next week will focus on the background and progression of CS in human society and culture, with a particular focus on the advancement of CS itself and scientific computing.
- Next Thursday will be a partial self-study/assignment period – your 1st assignment is to write a short report (2-4 pages single spaced) about a significant advancement in CS and the impact on society or a particular field.
  - I expect this to be a researched and thought-out report. Let's discuss expectations…

EXPECTATIONS

- Assignments: Open on Tuesday after class, must be submitted by email by midnight on the following Sunday.
  - Prog**rams and code:** Labelled with assignment number and last name (ex. "woodford_assignment1.py"), well documented with comments, runs as is.
  - **Reports:** Usually research based or accompanying code. If research based, they should be report format in LaTeX or at least have a title with the students name and date. If accompanying code, a title can be forgone. The name of the file should be the same as for programs : assignment number and last name.

    Reports are expected to be well-written and cited, especially for research based reports. Remember, if it's not your idea then you have to cite where you found the information – and Wikipedia does not count! If you're unsure how or what to cite, just let me know and we'll go over it case by case.

EXPECTATIONS

- In-class participation:
  - You are expected to be not just physically present, but mentally present during class – this isn't a lecture based class setting. We'll be actively solving problems and walking through examples during class time, and participating in these + trying your best is how you'll learn most effectively.
  - To participate, this means having a laptop to work on for every class. And no web-browsing or checking facebook – while it doesn't effect me, it means you're missing out on a valuable learning experience. Make sure you have one of the commonly used OS: Windows, Mac, or Linux.
  - Most/all the class material will be available at www.cita.utoronot.ca/~woodford, so feel free to download these before class or keep it open in an internet window as we walk through different files.

EXPECTATIONS

- I may be an instructor, but I don't know everything
  - Tell me what you'd like to learn or where you're getting confused – this is a really small class so I'd like to make sure everyone is getting the most out of the course.
  - If you have a question that I don't know the answer to, I'll do my best to find the answer from a credible source and we'll talk about it during the next class.
  - Don't be afraid to ask questions during class – that's the whole point! CS and coding in general are not straight-forward and can be really challenging. If we're going too fast or the concept is unclear, just say so.

EXPECTATIONS

- Grading Scheme/Final Project:
  - We've talked about assignments and in-class participation, which will make up 70% of your grade. The other 30% will be a final project.
  - The final project will be a sophisticated program that you've made and tested yourself accompanied with a report describing your chosen method and results.
  - While I encourage you to work together for in-class walk-throughs and assignments (no copying or cheating, of course), I must insist that you do not work together on the final project. This should be completely your own work without anyone else's input.

REPORT EXAMPLE

- This may be your first time writing a report like this. So let's look at some of the qualities of a well-written report.
  - We'll use a report I wrote this summer for my committee. Don't worry about the material – pay attention to the details.
  - Qualities to keep in mind: Title, Name, date, Course, section labels (if necessary), citations and references (which need author names, title of work, year published, editor/publisher (if a book), volume/number/page number (if a journal article)), labels for figures if included. You can find journal articles through google scholar or arxiv.org/corr/home.
  - Notice the length: 5 pages. This is considered long for a report (…), use 5 pages as your upper limit. Think **quality**, not **quantity**.
  - If you ever would like feedback on a report before submitting, you're more than welcome to meet with me to discuss it.

A LITTLE HOMEWORK

- Not really, just prep for your laptops.
- What you need to download to prepare for Week 3 (so you have this week and next week to do this):
  - If you're on Windows, download MobaXterm – a free linux client
  - Anaconda 3, which includes Spyder and Python 3.6
- There are links on where to download these on the website, but please let me know either in class or by email if you have any issues!
- If you can't wait to start coding, try out the workshop for SUSC that I made last month (again, on the website with code available for download).

THE BEGINNING…DEPENDING ON YOUR DEFINITION

- Although the modern concept of CS arrived with the 20th century, concepts and logic that make the basis of CS have been developed for far longer.
- What IS computing? What is the definition of a computer?

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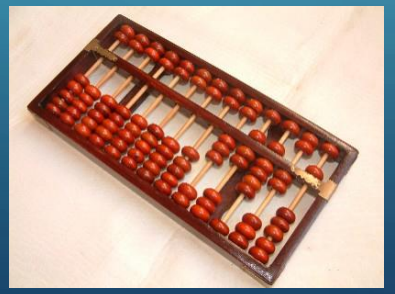
- Although the modern concept of CS arrived with the 20th century, concepts and logic that make the basis of CS have been developed for far longer.
- What IS computing? What is the definition of a computer?
  - Well, was it before or after the 60's? Computers were often referred to as people who did mathematical calculations (you might have noticed the terminology in the movie "Hidden Figures")
  - However, any device that aided in calculation was considered a computer. One of the oldest such devices would be the abacus, which is believed to have existed in 3000 B.C.



Abacus, Wikimedia commons

Hidden figures official movie poster

BEFORE 1900

- We've all used an abacus (think back to primary school!), and they really do help with calculations. However, more complex devices were invented and used throughout the 15th – 19th centuries.
  - Mechanical adding machines were invented in France in the mid 15th century and a couple of decades earlier in Germany
  - Encouraging use of the binary number system also started to arise during this time period (What's the binary number system?)
  - One of the crazier inventions was a modified loom that could weave complicated patterns by "reading" holes in punch cards – sound familiar?