Hello everyone!

Welcome to CMPT 295
Introduction to Computer Systems

My name is Anne Lavergne

Lecture 1 – Course Overview + Activity

How does it feel to be back on campus?

Today's Menu

- COVID Protocol
- What is CMPT 295?
  - What shall we learn in CMPT 295?
  - What should we already know?
  - Which resources do we have to help us learn all this?
- Activity
- Questions

COVID protocol – About masks!

- Unless we have an approved exemption, we are required to wear a mask in all indoor common and learning spaces, including classrooms. Please come to campus prepared with a non-medical mask.
  - If we forget our mask, disposable masks are available from Student Central in Burnaby and at the information desks in Vancouver and Surrey.
  - If we require a mask exemption in the classroom for medical reasons, please contact the Centre for Accessible Learning at cal_admin@sfu.ca for assistance.
  - If we are requesting mask exemptions on other protected grounds, such as religion, we can contact the Office of Student Support, Rights and Responsibilities at student_support@sfu.ca.
- And please remember to be kind to each other. If we see someone not wearing a mask, do not make assumptions or judgments as that person may be exempt.

What is CMPT 295?

➡ The goal of this course is to give us, software developers, a look "under the hood" of a computer, i.e., to learn about Computer Systems => microprocessor, memory, …

➡ This knowledge will allow us to become more efficient software developers

In CMPT 295, we shall learn .. The Big Picture

C program (.c)

How our code and data are represented in memory

Assembly program (.s)

How a compiler transforms our code into machine executable code in several steps

Object (.o) then Executable

How a compiler optimizes (or not) our code

Computer executes it

How a microprocessor is designed and how it executes our code

CPU   Memory

How memory is designed

How all of this can impact the execution of our code
How to write more efficient and reliable code:
- Be able to find and eliminate bugs more efficiently
- Be able to ascertain program performance and tune it by optimizing our code

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What should we already know?

- Write correct **C programs**
  - C constructs (variables, data types, pointers, if/else, switch/case, for/while/do while, function calls, arrays, …)
- What a **stack** is and how it works
- **Binary/decimal/hexadecimal** numeral systems
  - How to convert from one numeral system to the others
  - Basic arithmetic
- Perform Boolean algebra using **and**, **or**, **not**, **xor**

Which resources do we have?
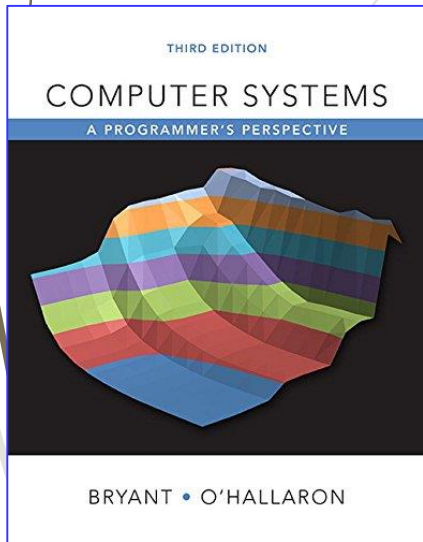
- Course web site
https://www2.cs.sfu.ca/CourseCentral/295/alavergn/index.html
- Textbook
  - Computer Systems: A Programmer's Perspective, 3/E, Randal E. Bryant, David R. O'Hallaron, Pearson, 2016
- Labs in CSIL (Computing Science Instructional Lab)
  - *Target Machine*: CSIL workstation
    - Linux platform (or OS)
    - C programming language
    - x86-64 assembly language
    - gcc compiler
- Instructor and TAs - Office hours

Activity - Discover our resources

➡ Instructions:

1. Form teams of 3 to 4
2. Do Lecture 1 Activity on CourSys
3. Time: about 30 minutes

Question?

Summary

✓ COVID Protocol

✓ What is CMPT 295?

    ✓ What shall we learn in CMPT 295?

    ✓ What should we already know?

    ✓ Which resources do we have to help us learn all this?

✓ Activity

✓ Questions

Next Lecture

- Data Representation
  - Representing information as bits

- To get ready for our next lecture:
  - *Optional*: Read Chapter 1 of textbook
  - *Not so optional*: Read Section 2.1 of Chapter 2
  - Download the partial lecture notes found under the column **Lecture** in the table on our course web site