Welcome to ULI101!

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1.1

ULI101 - Introduction to Unix/Linux and the Internet

Course Intro

Use Blackboard:

- Use Course Information to find out about Promotion Requirements
- Announcements: Quizzes, Tests and **Crucial Information** will be posted here
- Grades
- Course Documents

Local ULI101 Website

https://ict.senecacollege.ca/~eric.brauer/

This is where lecture notes will be posted.

- My Schedule, Useful Links, Links to Videos

General ULI101 Website

https://ict.senecacollege.ca/~uli101/

Good resource if you want a second perspective on what we discuss in class.

Other Resources

- Study Group (Very helpful!)
- Most important resource is your own *practice*.

Course Policies

- **Attendance**: I won't be taking attendance, except for quizzes/tests. Learn in whatever way you wish, but if you are missing/failing quizzes, be ready to change your approach.
- **Lateness**: Please be late quietly, or not at all.
- **Tests/Quizzes**: I will announce on Blackboard/in class/Email at least a week in advance. If you miss an assessment, you get a zero. If you have a doctor's note, you need to tell me **before** the assessment.
- **Academic Dishonesty**: Zero tolerance. I expect you to know the difference.
- If you have an issue, be prepared to communicate the **specific issue**, including:
    - error output.
    - what you have tried already.
    - the output of `history` (which we will learn about soon).

Course Policies II

- **Assignments** are a big part of this course, and they must be *completed* in order to pass.
- You will need to log on to our servers in order to work on these assignments.
- The assignments don't exist locally, you must have an internet connection to access the servers.- But your progress will be saved automatically as we go.
- **Most importantly, learn by doing.** Practice what you learn in the assignments.

So What is Linux, and why should you care?

Time for a History Lesson…

- Unix was developed in 1969, and was meant to run on *mainframes*.
- Unix was widely adopted by businesses but also academic institutions.
- Many people were comfortable with Unix, but it was *proprietary*, meaning it wasn't free to copy, use or modify.
- Richard Stallman started the GNU project in 1983, hoping to build a Unix-like operating system.
- Linus Torvalds contributed the *kernel* in 1991. So have that name 'Linux', but keep in mind that there were many contributors to the project.

Here is a short video about the history of Linux

Why do we care about an operating system from the sixties?

Because Linux is *everywhere*…

- Supercomputers
- Majority of Servers and Network Infrastructure
- Embedded computers (Think: Raspberry Pi, Cars, Kiosks, ATMs, etc.)
- Smartphones (until Fuchsia replaces Android!)
- Sometimes even on desktops. (~2%!)

Linux Took Over the Web, Now it’s Taking Over the World

What Does the History of Linux Have to do with Course?

The way it is organized is different.

- Assumes multiple users
- Better permission controls
- There’s a pattern of having multiple *terminals* active at any one time

Some Terminology

A Terminal

Terminal

Text input/output environment

Terminal Emulator

An application which simulates one of these old devices

Shell

Command line interpreter. The shell we will be using is called **Bash**.

SSH

A *secure* protocol that allows us to log into a machine remotely

This course is mostly about getting more comfortable with the Shell.

- CLI = Command Line Interface. CLIs are not unique to Linux. Powershell in Windows, Bash on Mac.
- Being able to use a CLI is a crucial skill for programmers for a number of reasons:
  - It's faster
  - A number of commands can be put into a script and can then be run automatically
  - Many servers or embedded systems won't even have a graphical environment installed, or it might be broken. A CLI could be your last resort
  - Many tools for developers are designed to be used from a CLI (for example, Git and NPM).
  - CLIs are much easier to set up for remote work
  - If you've ever had to try and help someone solve a problem remotely on their computer, you know how slow and awkward using a GUI can be. ("Click on the Start Button. No, the other Start Button. What do you see?") Using a GUI is like playing 20 questions. A CLI is all about communicating *directly* with the system. You need to know the language, but once you do you can get what you want much faster.

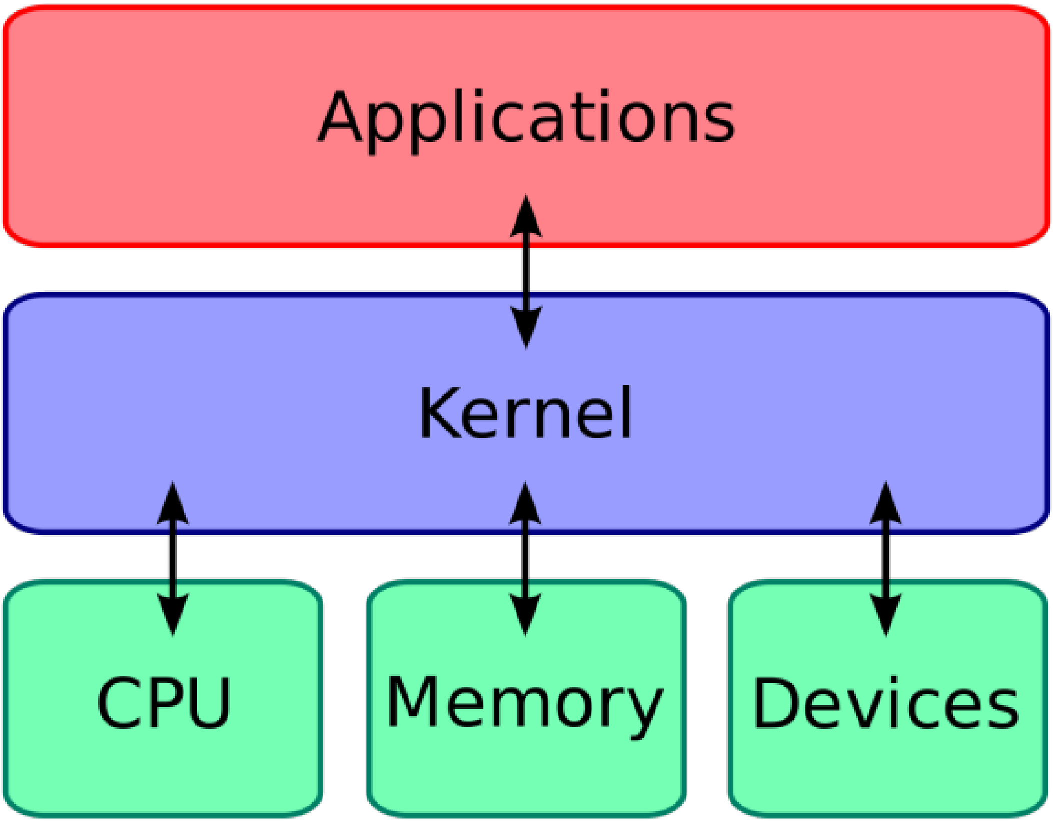
  - CLIs are more fun :D

What is Linux?

Linux is *actually* a Kernel.

Call it Linux, or GNU/Linux, probably at this point it isn’t too interesting to you. Just be aware that in some corners of the Internet, the terminology is important.

What is a Kernel?



A diagram of a Kernel

Kernel Summary

- *The Kernel is a thing that acts as an interface between applications and hardware.*
- *You can't directly interact with it. It's not quite the Operating System.*
- *Maybe a good analogy is an air traffic controller. You don't see the effect is you're a passenger at the airport, watching the planes. It doesn't affect your user experience at all.*
- *Linux has many desktop environments. But they all use the same Kernel.* (Windows, by comparison, has only one Desktop environment. It's running on the Windows NT kernel, but we never really talk about the Windows kernel.)
- Feel free to geek out over the specifics
- Feel free to geek over the specifics II

Steps to log into Matrix from the Lab

See the ULI101 Website

1. Use Myapps and search for *Putty 0.70*.
2. Launch Putty.
3. Enter `matrix.senecacollege.ca` for the host name, and click "Open."
4. If you see a dialog box about security, click 'Yes.'
5. When you see the text `Login as:` , enter your myseneca username. For example, `ebrauer11` . This is the same username you use to log into Blackboard. **(Must be lowercase!)**

6. Enter your Blackboard password.
7. If all is well, you should see a prompt that looks like this:

```
[eric.brauer@mtrx-node04pd ~]$
```

Commands Are What We *Really* Want You To Learn!

Once you are in Matrix/Knoppix, you can practice the following commands:

- `pwd` : Print working directory
- `cd` : Change directory
- `ls` : List files
- `ls -l` : List files *vertically*
- `ls -d` : List *directories*
- `ls -a` : List *all* (including hidden files)
- `cal` : Calendar
- `date` : Print today's date
- `who` : Who's online?
- `whoami` : Answering life's big questions

Next Steps.

- Assignment #1 is available to you. You should start working on it.
- To access the assignment, enter this into your terminal:

0. Login to: `matrix.senecacollege.ca` using your username and password.

1. Type `~uli101/assign1` at the command prompt.

- **Make sure you enter your correct section** or you stand to lose your work.
- Can take ~10 hours to complete the whole thing.
- As you go, your progress will be saved.
- But if you get stuck on a question, you aren't able to skip. So it's a good idea to start work early, and get help once you encounter those issues.