**Trent University: Operating Systems (COIS3320)**

**Dr. Bin Guo**

**Lab 1: Linux Environment**

# 1 Build Linux Environment

Each Student will be assigned an account for Loki, which is a Linux client provided by our department. It provides some standard development tools are included with it, including

(see below):

- gcc

- make

- java 8

- python

- Go

- ssh

This lab is to build your Linux environment since all our experiments are based on the Linux.

You can try many Linux commands in the terminal, to get familiar with the Linux Environment. <https://www.digitalocean.com/community/tutorials/linux-commands>

For example:

* ls
* pwd
* ps
* man
* cd
* mkdir

# 2 Virtual Machine

You need to build your own Linux environment in your machine for experiments. Here are some methods

## Directly instal Ubuntu in your machine

Ubuntu is the most popular Linux distribution derived from Debian and composed mostly of free and open-source software

<https://ubuntu.com/>

## For Windows Machine

If you have Windows machine, you can install virtual machine (VM) like VirtualBox. And then you can install Ubuntu as the VM.

If your OS is **Windows10** or 11, you can install the Windows Subsystem for Linux. It is not a virtual machine. The Linux physically runs on Windows.

[A close-up of a computer screen

Description automatically generatedInstall WSL Install Windows Subsystem for Linux with the command, wsl --install. Use a Bash terminal on your Windows machine run by your preferred Linux distribution - Ubuntu, Debian, SUSE, Kali, Fedora, Pengwin, Alpine, and more are available. craigloewen-msft](https://learn.microsoft.com/en-us/windows/wsl/install)

## For Mac

Mac has MacOS that is much like Linux. But, there are little differences between MacOS and Linux. You can install VM on Mac.

Note to macOS Users: Apparently, there are issues running the VirtualBox with Apple’s new M1, M2, M3, M4 processor.

If your OS is **MacOS**, you can finish almost all of the lab as MacOS is a Unix-based OS.

You also can install the VMWare (Virtual Machine Arm Versioni). And then you can install the Arm Version Ubuntu on your Mac.

<https://customerconnect.vmware.com/en/evalcenter?p=fusion-player-personal-13>

<https://ubuntu.com/download/server/arm>

# 3 Test Your Linux C

**Compile With GCC**

Here is a simple “Hello, World!” program in C.

#include <stdio.h>

int main() {

printf("Hello, World!\n");

return 0;

}

**Explanation**:

* #include <stdio.h>: Includes the standard input-output header file, which provides the printf function.
* int main(): The main function where the program execution begins.
* printf("Hello, World!\n");: Prints “Hello, World!” followed by a newline (\n) to the console.
* return 0;: Indicates that the program executed successfully.

You can save the file as hello.c, and then Compile with GCC and run it.

gcc hello.c -o hello

./hello

Or with linker and loader

gcc -c hello.c  
gcc -o hello hello.o  
./hello

Question: explain what is the meaning of “-c” and “-o”