1 Purpose

This project exposes you to operating system virtualization, prepares your personal computer as a development environment, and provides a common operating system for exploration in this course.

2 Installation

This section describes installation of the virtual machine VirtualBox and installation of Ubuntu 20.04 as a virtual machine managed by VirtualBox.

2.1 VirtualBox

Chapter 1 of the VirtualBox manual is referenced below.

1. Read 1.1–1.4 of the manual. Section 1.4 is particularly important: make sure your host OS is supported by VirtualBox.
2. Use Section 1.5 of the manual to install VirtualBox. If you run into trouble, see Chapter 2, Installation Details for details about the various installation methods.
3. Sections 1.8, 1.11, 1.12 are useful in learning how to use the VM.

2.2 Ubuntu 20.04 VM

Ubuntu provides an installation guide for installing Ubuntu 20.04 as a virtual machine on VirtualBox. The guide is referenced below.

When you begin to follow the "normal installation flow" at the end of step **3) Install your image**, ensure you do the following for later deliverables:

1. Set your Ubuntu installation hostname to **csce311**.
2. Use your USC ID (your username) as your username for the virtual machine, e.g. lewisjs4. If you already have a VM with Ubuntu 20.04 installed using a hostname other than csce311, create a user with the username uscid_csce311, e.g. lewisjs4_csce311.

3 Deliverables

You will need to take screenshots of the following (photos from your phone or other devices WILL NOT be accepted). To take a screenshot,

1. Click on the **Show Applications** button on the bottom right or left of your Ubuntu desktop.
2. Begin typing *screenshot* into the search bar at the top.
3. Select the Screenshot application and choose the option which makes the most sense to you.

Create and upload a single PDF document with one screenshot per page. Include a sentence below each screenshot describing the image. Submissions in any other format will be deleted. Multiple files will be deleted.

3.1 Update Ubuntu

Make sure you take a screenshot after you input each of the following commands. Note your username@hostname must be as described above to receive credit.

1. `sudo apt update`, take screenshot after execution.
2. `sudo apt upgrade`, take screenshot after execution.
3. `sudo apt install build-essential`, take screenshot after execution.

3.2 C/C++ Confirmation

Using the editor of your choice write a C or C++ to emit "Hello World" to the terminal.

1. Using your editor of choice, write C or C++ (`printf` or `cout`) source code to write the character string "Hello, World!" to standard output (the terminal, unless redirected). Take a screenshot of the code open in your editor.
2. Compile and link the source code above. Take a screenshot of the correct build output.
3. Run the object code in your terminal. Take a screenshot of the successful execution in your terminal. Note your username@hostname must be as described above to receive credit.

There are six points possible (one for each correct screenshot and explanation). This project is worth 5% of your total grade for this course.

The End.