

# CS 197U: Lab #1

Arun Dunna  
adunna@cs.umass.edu

Revision 1.3 - January 27, 2020

**NOTE: Submit your question responses to Moodle as a single PDF file.  
Include your name, student ID, and your date of submission.**

If a question asks for commands, give the complete command with options, arguments, etc.  
ex: “*vim file.txt*” instead of “*vim*”

The PDF should be named in the format: *lastname\_firstname\_lab1.pdf*

## Introduction

Often times with Computer Science, you can't learn just by watching and listening intently. You can study the material and memorize, but you won't truly understand the information and will forget within a semester. As a result, it is imperative to *practice by doing*.

## 1 Your Own Linux

Let's setup your own Linux system. As you may recall from lecture, there are a few ways of doing this. In this section, we will be using a virtual machine (VM). However, you may choose to run Linux natively or in a dual-boot environment.

### 1.1 Installing VirtualBox



**Info:** Before starting this section, ensure you have 30 GB of free disk space and a stable Internet connection. If you are unable to obtain either of these, post to Piazza.

If you already setup the machine in class, you can skip the setup part of this section.

To download VirtualBox, use one of the following links depending on your Operating System:

**Windows:** <https://download.virtualbox.org/virtualbox/6.0.2/VirtualBox-6.0.2-128162-Win.exe>

**macOS:** <https://download.virtualbox.org/virtualbox/6.0.2/VirtualBox-6.0.2-128162-OSX.dmg>

**Linux:** [https://www.virtualbox.org/wiki/Linux\\_Downloads](https://www.virtualbox.org/wiki/Linux_Downloads)

Once you have downloaded VirtualBox, you should install the software. If you have trouble doing this, you can search for a guide for your system (ex. “how to install virtualbox on windows 10”).

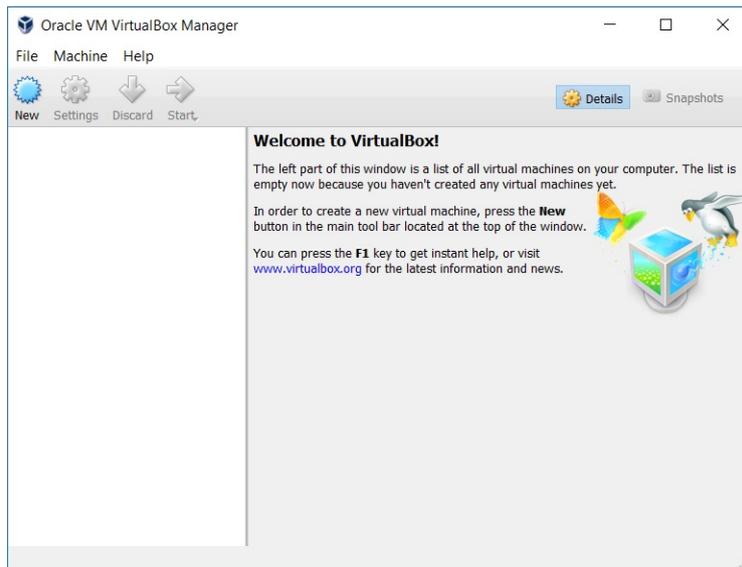


Figure 1: Screenshot of the VirtualBox Manager.

After installing the software, you'll need to start it up. It should look similar to Figure 1. You should also download the following file, which is the disk containing the installation contents for Ubuntu 18.04, and save it somewhere for use with VirtualBox (this may take some time): <http://mirrors.rit.edu/ubuntu-releases/18.04.3/ubuntu-18.04.3-desktop-amd64.iso>

If you prefer to use a different distribution or flavor, you may do so; just ensure that it is a distribution of Linux!

Once you have the software running and the disk downloaded, you'll need to setup the virtual machine in VirtualBox.

To do so, you can follow an online guide, such as [https://linuxhint.com/install\\_ubuntu\\_18-04\\_virtualbox/](https://linuxhint.com/install_ubuntu_18-04_virtualbox/). It is a short process. Make sure that you use the following credentials when creating your user account:

**Username:** student

**Password:** student

After you have setup your virtual machine, you can start it and login with those credentials. Congratulations!

#### Question 1

What method did you use to setup your Linux machine?

- (a) I used the linked Ubuntu 18.04 image and setup a virtual machine.
- (b) I used a different virtual machine.
- (c) I installed Linux to my computer without using a virtual machine.
- (d) I didn't.

## 1.2 Getting Comfortable

Once you've logged into your Linux system, you can poke around! Get used to the different look, as it's unlike any other interface.

When you're done checking out the system, open up a terminal. You can do this in a few ways:

- a) If you're running the Ubuntu VM, click the "Terminal" button in the left bar.
- b) Search your system for "Terminal", "Shell", etc.
- c) Some systems allow you to press: **CTRL + ALT + T**

After starting your terminal, you should perform the following and answer the questions in your response sheet:

#### Question 2

Change your user (student) password to a more secure one of your choosing.

**Q:** What command did you use to change your user password? (Don't give me the new password! For this question, only type the initial command you used to prompt you!)

#### Question 3

Use one of the commands shown in class to output your user ID.

**Q:** What command did you use to show your user ID?

#### Question 4

Use the **cd** and **ls** commands to explore around your home directory. Then explore around the system, starting in the root directory: /

**Q:** List 5 directories and 5 files you found in your system. These should be the absolute paths. Remember, you can use the **pwd** command to show your current directory.

### 1.3 The Real Stuff

Now that you've gotten comfortable, it's time to get to the main assignment questions!

You should answer the following questions and again, include your responses in your response sheet. All of this should be done in your home directory:

#### Question 5

First, change your user password to a more secure one of your choosing.

Then, create an empty file named: *iamempty*

The absolute path of this should be: `~/iamempty` same as `/home/student/iamempty`

**Q:** Which command did you use to create this file?

Question 6

Create a second empty file named: **notempty**  
Then, use **vim** to add the following text to the file:

Hello there! I am not an empty file!

**Q:** Which commands did you use to create and modify this file? What commands did you use inside **vim** to edit and save the file?

Question 7

Create a directory named: **lab1**

Then, move all the files you just created to that directory. Do this with a single command and a wildcard.

**Q:** Which command did you use to move your files?

Question 8

Go into the new directory, and use the **ls -l** command to show the contents with extended details.

**Q:** What command did you use to switch to the directory? What is the complete output of the **ls -l** command?

Question 9

We don't need the empty file anymore, so you should remove it.

**Q:** What command did you use to remove the file?

Question 10

We want three copies of **notempty** so please copy it enough times. We also want to rename the files **notempty1** through **notempty3**.

The directory should then have: **notempty1 notempty2 notempty3**

**Hint:** Remember you can use move to rename files: **mv file1 file2** is the same as renaming **file1** to **file2**

**Q:** What chain of commands did you use to accomplish this?

Question 11

In order to verify that each file has the same text, send all the contents of the files (concatenate them) to the standard output. You should do this with one command. This can be done with three arguments or with a wildcard.

**Q:** What command did you use?

Question 12

To get more used to **vim**, use it to type 5 random sentences of your choosing. Make sure each one is on a different line, and you can name the file anything you'd like; just make sure it ends with the extension: **.txt**

**Q:** What did you name the file? What is the absolute path to the file?

Question 13

Use a command to send only the first line of your new file to the output. Then, use a command to send only the last line to the output.

**Q:** Which commands did you use? What was the output for each?

Question 14

Lastly, list the contents of your home directory and list the contents of your **lab1** directory. Do this with two separate commands without leaving the **lab1** directory.

*Hint: Remember, you can supply an argument to **ls**.*

**Q:** Which commands did you use? What was the output for each command?

When you're all done, use the **exit** command to close the terminal. Then, you can shutdown your VM. Do this from the command line with **shutdown** and then close VirtualBox. You're done!