

# Homework 1

## Welcome, Setup, and Some Light Reading

**Due: Saturday, September 17, 10:00PM (Hard Deadline)**

### Submission Instructions

Submit this assignment on [Gradescope](#). You may find the free online tool [PDFescape](#) helpful to edit and fill out this PDF. You may also print, handwrite, and scan this assignment.

## 1 Set Up a Ubuntu Virtual Machine

One of the goals of this class is to understand systems work so that you can customize and improve them for yourself. On CAEN, course environments are already set up and everything “just works”. On a brand new Ubuntu install, however, we will have to find, install, set up and manage many tools ourselves.

Recall from lecture that a virtual machine (VM) is a fake computer running as a program. We’ll use a VM in this course as a playground to test things out and work without risking anything on your day-to-day machine. To kick things off, we start by getting a basic environment set up this week.

*One final thought:* Homework in this class will often be a little underspecified. You are expected to Google, to try things, and to fail from time to time. Making mistakes is highly encouraged, it’s how you learn. We have many office hours if you find yourself getting stuck, but we will always start with the questions, “What have you tried so far?” and “Why do you think that didn’t work?”

1. Get a copy of the **Desktop** version of **Ubuntu 16.04** (this is a big download, consider doing it on campus).
2. Download and install [VirtualBox](#).
3. Open VirtualBox and create a new virtual machine. Most of the defaults are fine. The default hard drive size of 8 GB is a little small, I recommend going bigger (50 GB or so). By default, disk images are *sparse*, which means it won’t take 50 GB of real disk space to create a fake disk, rather the fake disk will grow on demand as it’s used, so there’s not a lot of harm in choosing a big number.
4. Install Ubuntu on your new virtual machine. I recommend “Downloading updates while installing”.
5. Once Ubuntu is running, install the Guest Additions (try VirtualBox’s Devices menu → Insert Guest Additions CD Image; you’ll need to reboot once this finishes).

**Q: What are Guest Additions? What do they do? What changed after you installed them and rebooted your VM?**

Normally, a virtual machine doesn’t know that it isn’t running on real hardware. If it did know, however, it can do some things more efficiently (like batch hardware requests), as well as some convenience things. With guest additions installed, some changes you can immediately notice are that you can resize the window and the virtual machine “screen size” will change with it. You can easily move the mouse in and out of the virtual machine instead of “capturing” it. You can also turn on some features such as a shared clipboard (so copy/paste works in and out of the VM) or shared folders (folders that are “on” both “hard drives”).

6. Play around with your new machine! Try writing and running a Hello World program. What about other tools you’ve used before? Can you get an old course project running? How is it different than a CAEN environment?

## 2 Readings

Each of these are short blog posts, 5-10 minute reads. I selected these to give you a little exposure to some varying perspectives. The authors, Joel in particular, have several other very interesting posts that I highly encourage exploring. After each reading, write a response for the given question.

**Biculturalism** by Joel Spolsky

<http://www.joelonsoftware.com/articles/Biculturalism.html>

**Q: Has your computing experience thus far aligned more with “Windows culture” or “unix culture”? What makes you feel that way?**

**We discussed this question in lecture.**

*These two articles use the word “research” a lot, but the points made apply well to any work in computer science.*

**Helping my students overcome command-line bullshittery** by Phillip Guo

<http://www.pgbovine.net/command-line-bullshittery.htm>

and the counter-point

**On the value of command-line “bullshittery”** by Eytan Adar

<https://medium.com/@eytanadar/on-the-value-of-command-line-bullshittery-94dc19ec8c61>

**Q: What did you take away from these articles?**

**We discussed this question in lecture.**