CS102 FAQ's

Frequently Asked Questions

What programming development environment will be used?

We will use the Debian distribution of Linux running in a virtual machine (VM) within your own host computer. This way we will all have the exact same software tools and lab procedures. I suggest you bring a USB memory drive of at least 4GB to hold the virtual machine. If you are running Windows OS, then you can use QEMU to run the VM directly. If you are using a different OS (such as Mac), then you will need to install QEMU yourself.

What is Linux?

We use Linux since is free and open-source (unlike Windows and Mac). In the "old" days, it had a reputation as being not as intuitive to "normal" users, but that day is past and now there are many distributions that are just as easy to use as the commericial operating systems. `https://en.wikipedia.org/wiki/Linux`

What is QEMU?

"Quick Emulator" is also open-source (which means you can get the source code and modify/build it yourself if desired). "Quick" is a matter of opinion, and in the way we use it to emulate the Linux operating system on our host machines, you will probably not describe it that way (maybe more like the way Molasses flows?). It is useful to us since we can run Linux from a virtual hard drive that has all the software you need pre-installed! And all our lab procedures (very complicated) will be uniform no matter what operating system your host computer uses. `https://en.wikibooks.org/wiki/QEMU`

How do I install QEMU on a Mac?

I have not tried this since I do not own any Apple computers, but here is what my students have suggested in past semesters: Install QEMU on Mac

Are there any alternatives?

If you prefer you could use Virtual Box to run the VM. It is much faster than QEMU; however I do not use it because it is not open-source and requires that you have administrative rights to install (which you may not have if using a school labtop for example). Virtual Box

Should I bring my own laptop to school?

There are some advantages to that since then you will have the virtual machine running without having to copy your files from a "borrowed" school laptop each day; but then you have to carry your computer around with you which is less convenient than a USB drive which fits in your pocket. I bring my laptop.

Do I need to learn the Latex documentation language?

Well, "yes" and "no" really. We will use Latex to document our labs because documenting your program is a great skill/habit to develop. In addition, Latex allows us to use math symbols (like x^2 and $\sqrt{x}$ which is not possible directly in C++ source code comments. You will not be assessed on any Latex knowledge on exams, so think of using Latex for lab notebooks in the same way you would be using a word processor for an English class. You need to know how to use it, but it is not part of any quizzes or tests.

How can I upload/download files between the virtual machine my real computer?

- Host Computer OS: Windows, Mac, Linux, etc.

- http port is 80

- but usually host is not running a web server

- just a web client (i.e. browser)

Internet Sites
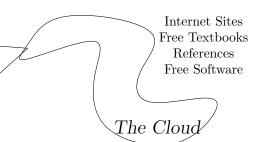Free Textbooks
References
Free Software

The Cloud

QEMU runs the virtual machine that has a virtual hard drive. This is seen as a single (uneditable) file on the host, but is complete file system on guest

- Guest Computer OS: Linux (Debian)

- **debian** is user name and password

- http port is 8080

- our guest is running a web server

To "download" files from guest to host use: localhost:8080 .
To "upload" files from host to guest use: localhost:8080/cgi-bin/file_upload.pl in the **host** browser

All our labwork is done here

The "virtual" computer

The "real" computer

What should I do if the virtual machine GUI does not load?

Sometimes the virtual machine boots up, but fails to bring up the graphical user interface. What you see is a black window with a prompt at the very bottom, but no colorful image. It is not clear how this happens, but here is one way to fix it:

If you are not even logged in (and are being prompted for userid), type this:

userid: `debian`

password: `debian`

It may appear that the password is not being accepted because there is no movement of the cursor or symbols such as asterisks (*) showing, but it is reading your keystrokes.

Then, when logged in, type this:

```
rm .xinitrc
startx
```

In a few moments, you should see the background image ("Literate Programming")

What do you mean by "Annotate the source code"?

Donald Knuth advocated that we (programmers) should realize that we are writing code not only to instruct the machine on how to compute our results, but equally importantly to communicate to other human beings how we are solving the specified problem.

For more info click here: Literate Programming

Especially in an academic setting, we will benefit greatly if we attempt to explain the syntax and semantics of our code to the reader. We can use C++ comments within our source files to accomplish some of that goal, but we can also add images, graphs, formatted text with colors and a variety of fonts to help explain to our reader what we are thinking, the design decisions we have made, and how our code works. So my request that you annotate your code means to add enough English text so that it is clear to you and me and anyone reading it what the code means.