CS 246 Fall 2015 - Tutorial 0

September 16, 2015

1 Summary

- Setting Up Linux
    - Mac
    - Windows
- Navigating Linux

2 General Administration Stuff

- Course E-mail: `cs246@uwaterloo.ca`
- ISA Office Hours: 11:00-12:00 Monday to Thursday (Sean), 3:00-4:00 Monday to Thursday (Yang Tian)
- Use `Piazza` for most questions
    - Questions containing potential solutions should be private or asked in office hours
    - If your question is made private by an instructor - keep it that way
- E-mail the course account or post on Piazza about topics you would like to see in upcoming tutorials

3 Configuring your system for using the Undergraduate Environment

3.1 Linux

- Most Linux distributions come installed with typical applications that you will need (e.g. vim, ssh, scp)
- Done. That was easy.
- Note: You may need to separately install git if you want to checkout a local version of the repository.

3.2 Mac

- Terminal: Every Mac has Terminal which runs a text interface for Unix.
    1. Access your linux.student.cs account. This is done by sshing into your account the command entered is `ssh userid@linux.student.cs.uwaterloo.ca`.
    2. You will need to install XQuartz for later assignments which can be downloaded here: http://xquartz.macosforge.org/landing
    3. Note: You may need to separately install git if you want to checkout a local version of the repository.

3.3 Windows

- You only need to use one of the following options:
- Putty (Recommended)
    - An ssh client which can be downloaded for free here: http://www.chiark.greenend.org.uk/ sgtatham/putty/download.html

- Use the host name `userid@linux.student.cs.uwaterloo.ca`. It is ideal to save this session so it does not have to be typed in each time.
- If using Putty, you will likely want to install programs on your local machine: Xming and WinSCP. Xming (http://sourceforge.net/projects/xming) will be used later in the course for some assignments. WinSCP (http://winscp.net/eng/index.php) is used to copy files (like assignments) from your Linux account to your local machine.

- Cygwin
  - A Unix-like environment and command-line interface for Windows downloaded for free here: https://cygwin.com/index.html
  - When installing Cygwin, you will need to be sure to install a number of packages including: x11, vim, g++, gdb, make, git, and ssh.

- Install Linux
  - Use Google

- Which should I choose?

  We generally recommend using Putty to directly access your account on the undergrad environment. The benefits are that the undergrad environment is regularly backed up so it is difficult to lose your documents due to computer failure and the undergrad environment has all programs we expect you to use. The downside is that you must have internet access.

  Cygwin is useful is you would like to have a bash interface on your PC. The benefits are that you can work without internet access and you can still ssh into the undergrad environment. The downside is that it is a large install and you'll likely have to reinstall later in the term when you are given additional programs to use. Cygwin is recommended if you do not want to work on the undergrad environment at all times or internet access is not always available.

  Installing Linux is recommended if you intend to use Linux after the course or you want to be fully integrated into a Linux environment. Details are not given for how to install Linux. It is left up to the user to determine how to do this if it is what they desire.

4 Navigating a command line environment

- Up until now, you've likely primarily used graphic interfaces (GUI) to operate a computer.

- Text-based interfaces can be intimidating at first because the user must remember a lot of commands to navigate and perform tasks

- For now, the commands you will need for navigating in Linux are:
  - `cd`: Change directories. Followed by a path. ex: `cd cs246/1151`
  - `ls`: Lists contents of the current directory.
  - `pwd`: Displays absolute path to your present working directory.

- More commands will be taught next week that will allow you to interact with files

5 Gitting up to Speed

- This course uses `git` as a mechanism for distribution of assignments, lecture material, and tutorial material

- `git` is a popular revision control system that was developed by Linus Torvaldis (*the Linux guy*)

- Why are we using `git` rather than Subversion (SVN) or CVS?
  - It has become somewhat of an industry standard (aka good for you to know)
  - The functionality is largely the same as any other revision control system
  - You get a client-side repository that you are free to modify, which allows you to rollback changes, branch code, etc
  - SVN/CVS do not allow this functionality, you are only able to modify the repository shared by everyone
  - Note that you cannot modify the global CS246 repository; only course staff can

- As discussed in A0, you first need to setup your Waterloo git account by visiting `https://git.uwaterloo.ca` and log in using the LDAP option with your WatIAM credentials.

- You are then free to issue `git clone https://git.uwaterloo.ca/cs246/1159.git` in your cs246 directory on the undergraduate environment

- Once you've checked out the repository then you should typically expect to issue `git pull` from within the cs246/1159 directory every lecture/tutorial day (times may vary).

    - This will update your local copy of the repostiory to reflect any global changes that course staff have made

- To modify your local copy and take advantage of version control, you should look into the commands: `git add`, `git commit`, `git rm`, `git checkout`

- The Course Notes have a nice demo showing how to modify a local repository

- Note that any attempt to push your local repository to the global one will fail. You should never need to execute a push command.

6 Tip of the Week

- Press on the up arrow to see previous commands

- The command `clear` will clear the terminal

- When typing in a command or file name, you can press tab to autocomplete the word if the remainder of the word is not ambiguous. Otherwise, it will fill in part of the word and pressing tab again will show the options for what word it could be.