TOOLS FOR CS

Why Care?

Why Command Line?

The Shell

- The shell is the program that actually provides your command interface.
- It has lots of built in features to help you
- There are several different shells
  - `bash` – *Bourne Again Shell (linux/unix)*
  - `zsh` – *Z Shell (linux/unix/MacOS)*
  - `sh` – *Shell (unix)*
  - `PowerShell` – *(Windows)*
  - `cmd.exe` – *(Windows)*

Shell Tricks

- Environment Variables
  - `echo $SHELL` – *what shell am I using*
  - `echo $PATH` – *Where to look for programs*
- History
  - ↑ *move back in history*
  - ↓ *move forward in history*

Commands

- `echo` – echo what ever follows to standard out
  - `echo $PATH`
- `cat` – concatenate files to standard out
- `curl` – transfer a url
- `ssh` – secure shell (get putty on windows)
  - `ssh netid@linux.ews.illinois.edu`
- `head` – print the first 10 lines to standard out
- `tail` – print the last 10 lines to standard out
- `sudo` – execute command as root (super user)

Paths and Directories

- `~` – your home directory
- `/` – the root directory
  - *In windows there is not one root but one per drive (i.e.* `C:`*)*
- `.` – the current directory
- `..` – the parent directory
- `fa23` – a relative directory
- `/Users/gcevans/UIUC/CStools/fa23` – absolute directory
- Case Sensitive in Unix not on MacOS and Windows

More Commands

- `cd` – change directory
- `pwd` – print working (current) directory
- `ls` – list the current directory
  - `ls –l`
- `mv` – move from a path to another path
- `cp` – copy from one path to another path
  - `cp –r`
- `rm` – remove file from a path
  - `rm –r`
- `rmdir` – remove a directory if empty

Connecting Things Together

- `>` – send to file
  - `echo $SHELL > shell.txt`
- `< -` read from file
  - `cat < shell.txt`
- `|` – pipe the output of one program to the input of the next
  - `ls –l | head`
- `;` – run one command then the next
- `&&` – run one command and if it worked run the next

Git and GitHub

Distributed Version Control Software

- Track changes to files especially computer code
- Work independently from others working on the same code
- Share changes between repos

Create a Repo on GitHub

Where to look for more

- The Missing Semester of Your CS Education
  - *https://missing.csail.mit.edu/*