Tools for Source Browsing and Debugging
Finding Files

- **tree**
  - Dumps the directory hierarchy to stdout
  - Pipe to `less` for easy scanning/searching
    - `tree | less`
    - Arrow keys or h/j/k/l to move
    - PgUp/PgDn or ctrl-U/ctrl-D to jump by half-screens
    - / to search down, ? to search up
    - n to repeat search, N to repeat search in the other direction
    - q to quit

- **find**
  - Powerful file search tool
  - find `<dir>` -name '<pattern>'
Searching Files

• `git grep`
  • Better than normal grep when in a git repo
  • `git grep [options] pattern [files/dirs...]`
  • `-i` for case-insensitive matching
  • `-w` to match the pattern on word boundaries
  • `-v` to invert the match
  • ... and much, much more!
    • `git help grep`
Searching Code

- **ctags (or etags)**
  - Index of all symbols in your source code
  - In your compile directory (e.g. kern/compile/ASSTo) run `bmake ctags` (or `bmake etags`)

- **Vim + ctags**
  - `ctrl-]` jumps to tag under cursor
  - `:tag <tag>` to jump to specific tag
  - `ctrl-T` jumps back one level in tag stack

- **Emacs + etags**
  - `M-. <RET>` jumps to tag under cursor
  - `M-. <tag>` jumps to specific tag
  - `M-*.` jumps back one level in tag stack
Superpowered Search

- cscope
  - `cscope -bR` to generate database
  - `cscope -d` for the cscope GUI
  - Incredibly powerful!
    - `man cscope`
  - Also has editor integration with vim/emacs
    - Requires some setup, so use your search-fu
Debugging

- cse451-gdb
  - Not your normal gdb!
    - `wget http://courses.cs.washington.edu/courses/cse451/14au/gdbinit` & `mv gdbinit .gdbinit`
  - Sets up gdb settings to make things a little nicer
  - Points to ASSTo code right now – you should edit this file to point to ASST1/2/3 when necessary
How to Debug

• In one window:
  • `sys161 -w kernel`
  • Or just hit ctrl-G while the kernel is running

• In another window:
  • `cse451-gdbtui kernel`
  • Or `cse451-gdb -tui kernel`
  • Or `cse451-gdb kernel` and hit ctrl-X a
  • Then use db to connect to sys161
Common GDB Commands

- next
- step
- break [if ...]
- print
- continue
- backtrace
- up
- down

- Once you get comfortable with the basic commands, check out http://www.eecs.harvard.edu/~margo/cs161/resources/gdb.html
Git

• Very powerful, very versatile source control tool
• Basic git tutorial:
  • http://courses.cs.washington.edu/courses/cse451/14au/tutorials/tutorial_git.html
• Once you have your group folders, take a look at this:
  • http://courses.cs.washington.edu/courses/cse451/14au/repo.html