

CSE 451 14au Section #2

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!
 - Download <http://courses.cs.washington.edu/courses/cse451/14au/gdbinit> to your root folder and rename to .gdbinit
 - `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 ASST_{1/2/3} 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>