

# Introduction to C and Unix

CS537 Section 304

by

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pointer, man and gdb

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shell, ssh, gcc, make and vi

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# Overview

1. 5 projects
2. Use C
3. Videos are useful
4. Start early
5. Mind your code quality

# What is a pointer

1. For now, treat the memory as a giant array
2. Pointer is like an index
3. How can we know the size of the data?

# Man

1. `man man`
2. An interface to the on-line reference manuals
3. We will mainly use `man 2` and `man 3`

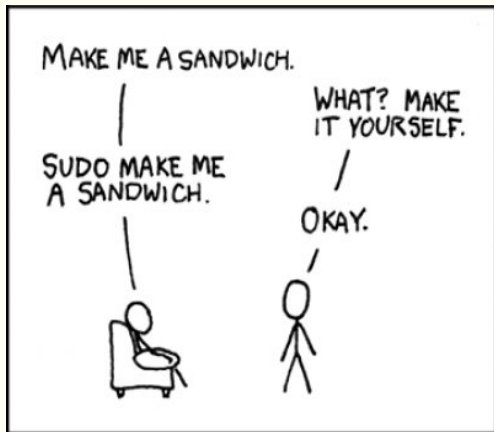
# Demo

# Get your weapon: shell

1. Linux: Ctrl-Alt-T
2. Mac OS: Cmd-Space, search "terminal"
3. Windows: Go to 1 or 2

# Shell: a servant

You write command, shell runs it for you.





# A philosophical shell

Who am I ...

```
$ whoami  
chengsu
```

```
$ date  
Sat Sep 3 20:57:13 CDT 2016
```

```
$ pwd  
/home/chengsu
```

# SSH

Login to a remote computer.

```
$ ssh remote_username@remote_host  
$ run-any-command-on-remote-computer  
$ exit
```

- ❖ Options: -X, etc.
- ❖ No hassle of password?
  - ❖ ssh keys
  - ❖ sshpass

GNU Compiler Collection.

1. ***preprocessing*** (C code)
2. compilation (assembly code)
3. assembly (binary code)
4. linking (executable binary code)

# Make

Recipe to cook (build) programs.

```
target: prerequisite1 prerequisite2 ...  
    command1  
    command2  
    ...
```

- Efficiency (compare timestamps of *target* and *prereqs*)

  - ❖ make ; make

- Other usage (not serious)

  - ❖ workflow control:

    - <http://widgetsandshit.com/teddziuba/2011/02/stupid-unix-tricks-workflow-control-with-gnu-make.html>

# Vi: text editor

## ❏ Basic usage

- ❏ write code: `i` (insert mode)
- ❏ write command: `<Esc>` (command mode)
- ❏ go to a line: `:12` (go to 12th line)
- ❏ copy a line: `yy`
- ❏ paste a line: `p`
- ❏ search a word: `/dog` (search word: `dog`)
- ❏ undo: `u`

## ❏ How to learn Vi/Vim

- ❏ `vimtutor`
- ❏ <http://www.openvim.com>
- ❏ even a game to play: <http://vim-adventures.com>

## ❏ Configure Vi

- ❏ dotfile: `.vimrc` (set indentation to 2 space)

# Suggested Readings

## ❖ C

- ❖ The C Programming Language
- ❖ Expert C Programming: Deep C Secrets (Chapter 1)

## ❖ Unix (Basic)

- ❖ Survival guide for Unix newbies
- ❖ Settling into Unix
- ❖ The Unix Programming Environment (Chapter 1)

## ❖ gcc, gdb and make

- ❖ Our Lab Tutorial
- ❖ Managing Projects with GNU Make (Chapter 1)