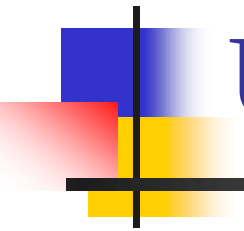
Lecture 00



UNIX Programming

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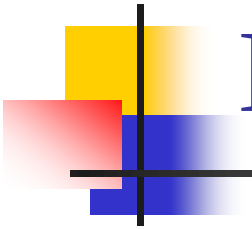
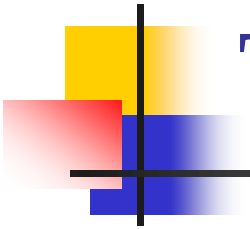


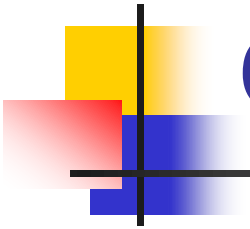
How to get course data

- https://github.com/CGUSystemCourses/Unix-2015



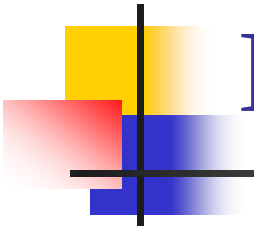
Textbooks

- W. R. Stevens and S. A. Rago, *Advanced Programming in the UNIX Environment*, 2ed, Addison Wesley 2005
- A. Silberschatz, P. B. Galvin, and G. Gagne, “Operating System Principles,” 7/e, Jon Wilely & Sons, 2006
  - your OS textbook!
- Michael Kerrisk, “Linux Programming Interface: A Linux and Unix System Programming Handbook,” No Starch Press, 2011.
- “man” and “info” of UNIX



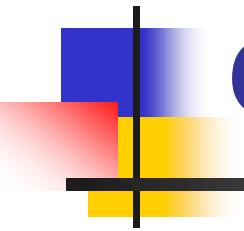
Grading

- Homework: 60%
  - 8 program assignments expected
  - e.g. shell, parallel matrix multiplication
- Project: 40%
  - do what you feel interested
  - e.g. network messenger like MSN



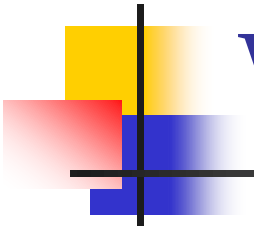
Experiment Environment

- Fedora Core or Ubuntu
  - the CSIE server: Ubuntu
  - my laptop: Fedora Core 9
- with GNU tool-chain
  - gcc (the C compiler)
  - gdb (the GNU debugger)

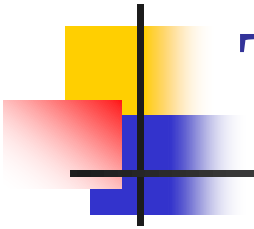


Content of this Course

Why learning UNIX?



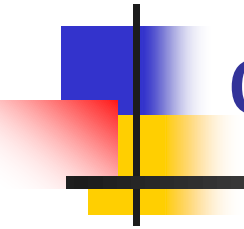
- academic research
  - lots of open-source free software
  - innovative software appears on UNIX first
- network computing research (cluster/grid)
- embedded system and SoC (system-on-chip)
  - most of embedded software are Linux-based
- MOST IMPORTANT: make you an expert on playing computer!

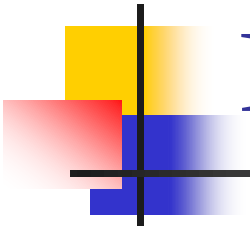


Topics Covered

- UNIX architecture
- File System Operations
- Terminal I/O
- Concurrent Programming
  - process/thread, signals, semaphores, IPC, etc.
- Network Computing
  - socket, RPC

Your preparation for taking this course

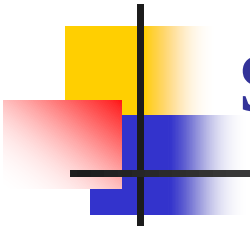




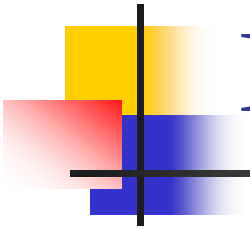
First-thing to do

- setup your Linux
  - use the embedded system LAB (dual-boot w/ Fedora-4)
  - use your own computer
    - most of Linux distribution (e.g. Fedora 9+) supports dual-boot
    - you can still have your M$-Windows with Linux
- test the following software works
  - shells: bash, tcsh, etc.
  - programming tools: gcc, gdb, make
  - your favorite X-window: KDE/Gnome
  - your favorite GUI debugger (ddd, kdbg, etc.)
  - your favorite text editor (kwrite, emacs, vi, etc.)

First UNIX instruction you should learn



- man
  - "man *command"* to look for how to use certain command
    - Example: "man gcc"
  - man –k *keyword*
    - Example: "man –k compiler" to search for compilers installed on your system
- info
  - Example: "info gcc" for detailed manual of gcc compiler



Next Lecture

- basic UNIX administration
  - frequently used shell commands
  - basic shell programming
  - environment setup
- How to write a program on UNIX
  - compile
  - debug
  - make