

Advanced Programming COEN 11

Intro

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Overview

- ❑ Administrative Stuff
- ❑ What this course is all about
- ❑ Environment - Unix and C
- ❑ C - overview
- ❑ Lab 1

Administrative Stuff

- ❑ Classes: M/W/F
- ❑ Office Hours:
 - Monday & Wed 3-4pm
 - By appointment
 - Anytime by email

Course materials

- ❑ Camino: <http://camino.instructure.com/>
 - lecture slides
 - lab projects
 - Homework
 - Resources

My Info

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Labs

- ❑ Monday 5:15-8:00pm
- ❑ Tuesday 2:15-5:00pm
- ❑ Wednesday 2:15-5:00pm
- ❑ Weekly projects
- ❑ TA:

Immanuel Amirtharaj (iamirtharaj@scu.edu)

Andreas Adolfsson (aadolfsson@scu.edu)

Alan Nguyen (aknguyen@scu.edu)

Administrative Stuff

□ Grading

➤ Exams

- Quizzes (30%)
- 2 Midterms (30%)
- 1 Final (30%)
- 1 Project (10%)

Administrative Stuff

□ Grading

➤ Labs

■ Grading:

- On time, works with all the requirements: full credit
- Late and/or not complete: partial credit
- Not returned or does not work at all: no credit

Administrative Stuff

- ❑ Lab projects
 - mandatory
 - individual
 - require demo
- ❑ Environment
 - Unix/Mac OSX
 - C
 - vi

Administrative Stuff

- Homeworks
 - For practice
 - Not for grade

Text book

C primer plus
Stephen Prata, 6th Edition, 2014.

Unix Book

- ❑ The UNIX Programming Environment
Brian W Kernighan and Rob Pike, Prentice Hall,
1984.
- ❑ A cheat sheet of basic commands can be found
at Camino

Introduction

- ❑ What is this course all about?
 - Lots of programming!
 - Usage of programming techniques for solving problems
 - Advanced programming techniques
 - Pointers
 - Strings
 - Dynamic Memory Allocation
 - Recursion
 - File I/O
 - Threads

Environment

❑ System → Unix

- Dominant operating system for high-end workstations and servers
- Runs on a variety of computers
 - from notebooks to supercomputers
- It was carefully designed to be simple
 - In spite of its age, it is still modern and elegant

Environment

❑ System → Unix

➤ Many OS design principles came with, or from Unix

- Many of these design principles have been copied by other systems

➤ Many versions

- Linux, BSD
- Mac OSX, IBM AIX, HP-UX, Sun Solaris, ...

Environment

❑ Unix

- Designed by programmers for programmers
- Interactive system
- Designed to handle multiple processes and multiple users at the same time
- System is expected to be simple, elegant, and consistent
 - Files should be just a collection of bytes
 - Commands should accept parameters in the same way
 - The commands' interface should be simple

Environment

❑ Unix → important feature

➤ Good (and fast) programmers type, don't click!!

- Linux terminal mode

- Editor: vi or vim

- On your computer

- Mac: terminal

- » Remote login: `ssh -l <username> mac.dc.engr.scu.edu`

- Windows: PuTTY or cygwin

Environment

- ❑ Unix → command format
 - `cmd [-options] arguments`
- ❑ To verify a command's format
 - `man cmd_name`

Environment

□ Unix → very useful commands

➤ Directories

- To create -- `mkdir name_dir`
- To remove -- `rmdir name_dir`
- To list the contents -- `ls [name_dir]`
- To traverse
 - To go down -- `cd name_dir`
 - To go up -- `cd ..`
 - To go up and/or down - `cd path_name`

Environment

□ Unix → very useful commands

➤ To edit

- vi name_file

➤ To see the contents of files

- cat file_names
- more file_names

Environment

□ Unix → very useful commands

➤ To manipulate files

- Remove - `rm file_name`
- Copy -- `cp file_name_from file_name_to`
- Compare -- `cmp file_name_1 file_name_2`
- Remote transfer -- `ftp machine_name`

Environment

❑ Language → C

- General purpose, machine-independent
- Developed at Bell Labs in 1972 by Dennis Ritchie
- Main language used for development, especially for lower level programming

Dennis Ritchie (1943-2011)



Dennis Ritchie (right) with Ken Thompson

Environment

- ❑ C programs should have a .c extension
- ❑ To compile and execute at the terminal

➤ Default

- `gcc name.c`
- `./a.out`

➤ or

- `gcc -o name name.c`
- `./name`

Login

- ❑ The address of the machines in the DC are:
- ❑ Linux: `linux.scudc.scu.edu`
- ❑ Macs: `mac.dc.engr.scu.edu`