EECS 10: Computational Methods in Electrical and Computer Engineering

Lecture 2

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Lecture 2: Overview

- Introduction to Computers
  - What is a computer?
  - What is programming?
- Getting started
  - Obtain your UCInetID
  - Obtain an account on the EECS servers
  - Log into the server
- Unix system environment
  - System commands
  - Text editing

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Introduction to Computers

- What is a computer?
  - Digital device capable of executing programs
    - performing computations
    - making logical decisions
- What is a program?
  - Set of instructions which process data
    - input data   (e.g. from keyboard, mouse, disk)
    - output data   (e.g. to monitor, printer, disk)
- What is programming?
  - Creation of computer programs by use of a programming language

Introduction to Programming

- Categories of programming languages
  - Machine languages   (stream of 1's and 0's)
  - Assembly languages   (low-level CPU instructions)
  - High-level languages   (high-level instructions)
- Translation of high-level languages
  - Interpreter   (translation for each instruction)
  - Compiler   (translation once for all code)
  - Hybrid   (combination of the above)
- Types of programming languages
  - Functional   (e.g. Lisp)
  - Structured   (e.g. Pascal, C, Ada)
  - Object-oriented   (e.g. C++, Java, Python)

Getting Started

- Obtain your UCInetID
  - Your unique ID at UCI
  - Activation online at OIT (NACS) web pages:

    `http://activate.uci.edu/activate/menu.html`

- Obtain an account on the EECS servers
  - Your working account in EECS
  - Activation online at EECS web pages:

    `https://newport.eecs.uci.edu/account.py`

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Getting Started

- Log into the server
  - Use a terminal with SSH protocol (secure shell)
  - Connect to an EECS server
    - `malibu.eecs.uci.edu`
    - `vivian.eecs.uci.edu`
    - `newport.eecs.uci.edu`
  - Authorize yourself with user name and password
- Work in the Unix system environment
  - Unix shell prints command prompt awaiting input
  - Type in system commands
    `echo`, `date`, `ls`, `cat`, `man`, `more`,
    `pwd`, `mkdir`, `cd`, `cp`, `mv`, `rm`, `rmdir`
  - Refer to manual pages for help on commands

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Unix System Environment

- Unix system commands
  - **echo**   print a message
  - **date**   print the current date and time
  - **ls**   list the contents of the current directory
  - **cat**   list the contents of files
  - **more**   list the contents of files page by page
  - **pwd**   print the path to the current working directory
  - **mkdir** create a new directory
  - **cd**   change the current directory
  - **cp**   copy a file
  - **mv**   rename and/or move a file
  - **rm**   remove (delete) a file
  - **rmdir** remove (delete) a directory
  - **man**   view manual pages for system commands

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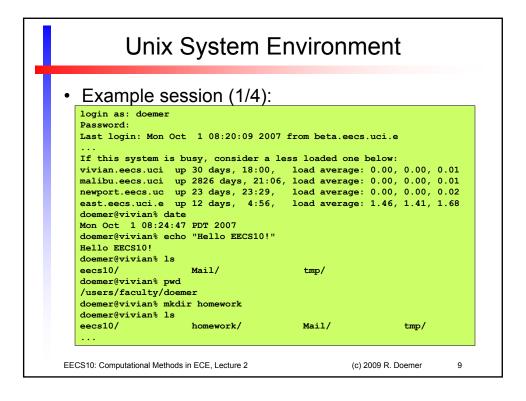
Unix System Environment

- Text editing
  - **vi**   standard Unix editor
  - **vim**   vi-improved (supports syntax highlighting)
  - **pico**   easy-to-use text editor
  - **emacs** very powerful editor
  - many others...
- Pick one editor and
  make yourself comfortable with it!

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Unix System Environment

- Example session (1/4):

```
login as: doemer
Password:
Last login: Mon Oct  1 08:20:09 2007 from beta.eecs.uci.e
...
If this system is busy, consider a less loaded one below:
vivian.eecs.uci  up 30 days, 18:00,   load average: 0.00, 0.00, 0.01
malibu.eecs.uci  up 2826 days, 21:06, load average: 0.00, 0.00, 0.01
newport.eecs.uc  up 23 days, 23:29,   load average: 0.00, 0.00, 0.02
east.eecs.uci.e  up 12 days,  4:56,   load average: 1.46, 1.41, 1.68
doemer@vivian% date
Mon Oct  1 08:24:47 PDT 2007
doemer@vivian% echo "Hello EECS10!"
Hello EECS10!
doemer@vivian% ls
eecs10/          Mail/               tmp/
doemer@vivian% pwd
/users/faculty/doemer
doemer@vivian% mkdir homework
doemer@vivian% ls
eecs10/          homework/          Mail/            tmp/
...
```

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Unix System Environment

- Example session (2/4):

```
...
doemer@vivian% cd homework
doemer@vivian% pwd
/users/faculty/doemer/homework
doemer@vivian% ls
doemer@vivian% mkdir hw1
doemer@vivian% ls
hw1/
doemer@vivian% cd hw1
doemer@vivian% ls
doemer@vivian% vi program.c
doemer@vivian% ls
program.c
doemer@vivian% ls -l
total 2
-rw-------   1 doemer   smmsp        51 Oct  1 08:32 program.c
doemer@vivian% more program.c
This is my new program file.
I don't know C yet...
...
```

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Unix System Environment

- Example session (3/4):

```
...
doemer@vivian% cp program.c mybackup.c
doemer@vivian% ls
mybackup.c   program.c
doemer@vivian% ls -l
-rw-------   1 doemer    smmsp         51 Oct  1 08:34 mybackup.c
-rw-------   1 doemer    smmsp         51 Oct  1 08:32 program.c
doemer@vivian% cd ..
doemer@vivian% pwd
/users/faculty/doemer/homework
doemer@vivian% ls
hw1/
doemer@vivian% /ecelib/bin/turnin
=======================================
EECS 10 Fall 2007:
Assignment "hw1" submission for doemer
Due date: Mon Oct  8 11:59:59 2007
=======================================
...
```

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Unix System Environment

- Example session (4/4):

```
...
Submit program.c [yes, no]? y
Cannot read file program.c
Submit mybackup.c [yes, no]? n
=======================================
   Summary:
=======================================
You just submitted file(s):
    program.c
You have not submitted file(s):
    mybackup.c
doemer@vivian% ~eecs10/bin/listfiles.py
=======================================
EECS 10 Fall 2007: "hw1" listing for doemer
=======================================
Files submitted for assignment "hw1":
program.c
doemer@vivian% logout
```

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