# EECS 10: Computational Methods in Electrical and Computer Engineering

## Lecture 2

Rainer Dömer

doemer@uci.edu

The Henry Samueli School of Engineering
Electrical Engineering and Computer Science
University of California, Irvine

## 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

## 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 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`**



## 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

## 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



## 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!

# 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/
...
```



# 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...
...
```

## 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
=======================================
...
```



## 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
```