

EECS 10: Computational Methods in Electrical and Computer Engineering

Lecture 1

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Lecture 1: Overview

- Course overview
- Introduction to Computers
- Course administration
 - Course web pages
- Getting started
 - Obtain your UCInetID
 - Obtain an account on the EECS servers
 - Log into the server
- Linux system environment
 - System commands
 - Text editing

Introduction

- Course Contents
 - Introduction to computers
 - Introduction to structured programming
 - C, a high-level structured programming language
 - Binary data representation
 - Introduction to algorithm efficiency
 - Solving engineering problems
 - Applications of structured programming
 - Hands-on experience
 - Laboratory and discussion sessions

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)

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Course Administration

- Course web pages online at <http://eee.uci.edu/18f/18005/>
 - Instructor information
 - Course description and contents
 - Course policies and resources
 - Course schedule
 - Homework assignments
 - Course communication
 - Message board (announcements and technical discussion)
 - Email (administrative issues)

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Getting Started

- Log into the server
 - Use a terminal with SSH protocol (secure shell)
 - Connect to the EECS Linux server
 - `crystalcove.eecs.uci.edu`
 - `zuma.eecs.uci.edu`
 - Authorize yourself with your UCI netID credentials
- Work in the Linux system environment
 - Linux 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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Linux System Environment

- Linux 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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Linux 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!

Linux 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
% date
Mon Oct  1 08:24:47 PDT 2007
% echo "Hello EECS10!"
Hello EECS10!
% ls
eecs10/          Mail/           tmp/
% pwd
/users/faculty/doemer
% mkdir homework
% ls
eecs10/          homework/      Mail/          tmp/
...
```

Linux System Environment

- Example session (2/4):

```

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

```

Linux System Environment

- Example session (3/4):

```

...
% cp program.c mybackup.c
% ls
mybackup.c  program.c
% ls -l
-rw----- 1 doemer smmsp      51 Oct  1 08:34 mybackup.c
-rw----- 1 doemer smmsp      51 Oct  1 08:32 program.c
% cd ..
% pwd
/users/faculty/doemer/homework
% ls
hw1/
% ~eecs10/bin/turnin.sh
=====
EECS 10 Summer 2017:
Assignment "hw1" submission for doemer
Due date: Mon Jul  3 11:00:00 2017
=====
...

```

Linux 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
% ~eecs10/bin/listfiles.py
=====
EECS 10 Summer 2017: "hw1" listing for doemer
=====
Files submitted for assignment "hw1":
program.c
% logout
```