

# CS1004: Intro to CS in Java, Spring 2005

Lecture #2: Intro to UNIX

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## Administrivia

- **SECOND SECTION!**
  - TR 2:40pm-3:55pm, 207 Math, taught by former TA William Beaver
  - Call number to be determined by Friday morning – check the Columbia course listing (<http://www.columbia.edu/cu/bulletin/uwb/>)
  - *Please*, if the time is convenient, consider switching
  - This is the last “single section” lecture
- Textbooks should be available from Morningside now
- Reminder – AcIS hands-on CUNIX sessions starting this Friday

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## A “Warning”

- I’m about to cover a lot of material in 75 minutes
- I don’t expect you to get everything initially, but try and understand *the basics* of what’s going on
- Stop me and ask questions!
  - Especially if I type something too quickly

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## What is UNIX?

- UNIX was an operating system invented in AT&T/Bell Labs in the 70s
  - “Pun” on Multics; see <http://www.hyperdictionary.com/dictionary/Unix>
- Became extremely popular as it was easily adaptable to a variety of computing hardware, and because it supported multiuser/multitasking environments
- Who owns “UNIX” now?
- Linux is not UNIX -- but is *very* similar

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## Why do you need to know UNIX?

- Columbia’s main computing cluster runs a version of UNIX
  - Sun’s Solaris 9 == Solaris 2.9 == SunOS 5.9
- Provides an “equal” and robust environment for everyone to work in
- Useful for many engineering fields, or as a background for anyone interested in Computer Science
  - Resume material

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## Is UNIX user-friendly?

- No.
- Well, it’s getting better, but for many years, UNIX was considered “hacker/programmer-friendly”
  - Simple example: commands are generally very short
- UNIX is heavily command-line driven
  - A “command-line” is a textual way of interacting with a computer, one line at a time
  - Windows has a command-line too: Start => Programs => Accessories => Command Prompt
  - Less intuitive, but very powerful

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## How do you log onto CUNIX?

- Through an AcIS workstation
  - In particular, 251 Engineering Terrace: full Windows lab
    - Requires extended account, unlike other AcIS labs
- Through a campus kiosk – but awkward for long periods of time
- Via a remote machine: use ssh (Secure Shell)
  - Windows: AcIS provides a free ssh client, PuTTY
    - <http://www.columbia.edu/acis/software/putty/>
  - Mac OS X: use the Terminal app
    - <http://www.columbia.edu/acis/software/inet/osx-terminal.html>

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## Useful UNIX commands

- |                                   |  |
|-----------------------------------|--|
| ■ <b>ls</b> : List files          | ■ <b>cd</b> : change directory         |
| ■ <b>mv</b> : move/rename files   | ■ <b>pwd</b> : print working directory |
| ■ <b>cp</b> : copy files          | ■ <b>man</b> : manual page             |
| ■ <b>rm</b> : remove files        | ■ <b>gcc, javac</b> : compilers        |
| ■ <b>cat</b> : print out a file   | ■ <b>emacs, pico, vi</b> : editors     |
| ■ <b>mkdir</b> : make directory   | ■ <b>more, less</b> : pagers           |
| ■ <b>rmdir</b> : remove directory | ■ <b>lpr</b> : print (in 251)          |

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## Directory structure

- Ever used Windows Explorer?
- A “/” is the *delimiter* to separate out parts of the *pathname*
  - Windows uses “\”...
  - Just “/” is the root: *no* drive letters in UNIX
- “..”: parent directory
- All your files are in *~UNI/* or just *~/* for short
  - *~* is a special “go home” directive, either to your own or someone else’s
  - To see the exact location, type in “pwd”

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## UNIX environment

- You run in a “shell”, typically bash
- “Settings” that apply when you’re logged in
- PATH: where to look for programs to run (including the aforementioned UNIX utilities, which are in /usr/bin)
- **set, export:** Lets you manipulate the environment
  - “export CLASSPATH=/home/jjp32/javacode”
  - Goes into “~/.profile” if you want it to be automatic
- Don’t worry about this yet, just keep it in mind...

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## Pipes, redirection

- Lets you reroute output from one program to a file (redirection) or to another program (pipes)
- **ls > test.txt:** Puts list of files in test.txt
- **less < test.txt:** Cat’s test.txt through a pager
- **ls | less:** Useful if you have a long list of files

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## Editors

- Pico: The “Pine Composer” – *very* easy to use, but very plain-jane
- Emacs: “Editor MACroS”
  - Extremely powerful
  - <http://c2.com/cgi/wiki?EmacsStandsFor>
  - I recommend this, especially “over” X – auto-indenting will save you *many* times over
- Vi: “Visual Interpreter”
  - Want to be 1337er than me? Learn this
- Windows tools, IDEs: you can use, but not supported

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## Next time

- Continue UNIX introduction
- Begin Computer Science introduction

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