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Administrivia

- Accounts and passwords should be set up. (We will try to straighten out lost/missing passwords in class.) To change your password, use the command `yppasswd`.
- Information about UNIX/Linux commands, text editors, etc., is available via the “Useful links” page ([here](#)).
- Notice addition to readings for today (a learn-by-doing tutorial by one of my colleagues.)
- First homework to be on Web soon, due in about a week. Details coming by e-mail soon.

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A Word About Tools

- In this class we use the C programming language, Linux, and command-line tools, because we believe it is important for budding computer scientists to know something about “low-level computing”.
For others — exposure to something new and different, and a good foundation for learning whatever other programming language you might later want to use.
- A UNIX person’s response to claims that UNIX isn’t user friendly: “Sure it is. It’s just choosy about its friends.”

Getting Started with Linux

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- When you log in, you should get a graphical desktop, which should be navigable with what you know from using other graphical environments (though some details are different).
- In Linux, we talk about files and directories; the idea is the same as Windows' files and folders, though again some details are different.
- The graphical system should give you a way to get a terminal window. Once you have that . . .

Getting Started With the Command Line

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- What you get when you start a terminal window is a "command shell", similar to Windows' "MS-DOS prompt". Rather than pointing and clicking, you type the name of the program you want to run, plus whatever arguments (parameters) it needs.
- Let's try some:
 - `pwd` shows the current directory.
 - `ls` lists the current directory. Add `-l` to get more information.
 - `cd foo` changes to directory `foo`. Just `cd` goes back to your home directory. Try `cd Local` and then `ls`.

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Useful Command-Line Tips

- The shell (the application that's processing what you type) keeps a history of commands you've recently typed. Up and down arrows let you cycle through this history and reuse commands.
(Pedantic aside: "The shell" here means the one you're most likely to be using. There are other programs with similar functionality you could use instead.)
- The shell offers "tab completion" for filenames — if you type part of a filename and press the tab key, it will try to complete it.
- To learn more about command `foo`, type `man foo`. (This also works with C library routines — more about them later.) This is reference information rather than a tutorial, but usually very complete.

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Programming Basics

- What computers actually execute is *machine language* — binary numbers each representing one primitive operation. Once upon a time, people programmed by writing machine language (!).
- Now, "programming" as we will use it means writing *source code* in a *high-level language*.
- Source code is simply plain text, which is *compiled* into *object code* (machine language) and then *linked* with other object code (including system libraries) to form an *executable* (something the operating system can execute).

Source Code and Text Editors

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- How do you get source code?
- The simplest way is to create it with a *text editor* — a program for writing and editing plain text.
- Many, many text editors, and people have favorites. Notepad is an example from the Windows world.
- I use and will teach in this class `vi`: It's found on every UNIX/Linux system I know of, and is very powerful, though it takes a little getting used to. (`vi` on our Linux machines is actually `vim`, a more capable “clone” of the original `vi`.) Other popular Linux text editors include `emacs`, `pico`, and `gedit`.

`vi` Basics

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- `vi` has two *modes* — insert mode (where what you type goes into the file) and command mode (where you can type commands to copy, move, delete, save, etc.).
- You start an editing session by typing, e.g., `vi hello.c`. It starts in command mode. Enter insert mode by typing `i`. Exit by pressing `ESC`. Move around with the arrow keys. Delete a single character with `x`. (Try entering some text.)
- Save and exit by typing `:wq`.
- *Highly recommended*: `vimtutor` brings up an interactive tutorial.

A First C Program

- Let's write the traditional "hello world" program in C, using `vi`.
- Once it's written, compile-and-link by typing `gcc hello.c`. (There are other options you should use, but for now this is okay.) Result is `a.out`.
- Execute by typing `a.out`.

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More Commands

- Now that we have a couple of files, we can try out some other basic commands.
- `cp` to copy one file to another.
- `mv` to move or rename a file.
- `rm` to delete a file. (Note — no recycle bin, so use with caution.)

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Minute Essay

- What today seemed most unclear?

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