COMP 2710 Software Construction

Prepare Your Development Environment

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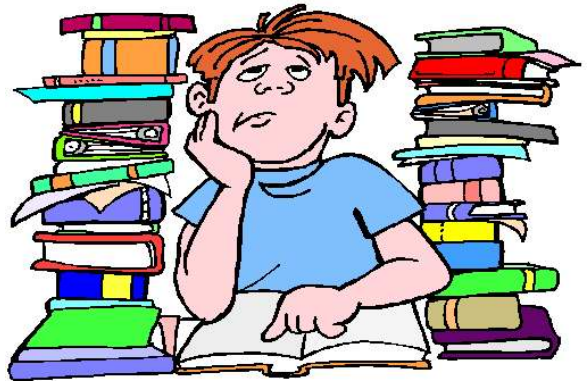
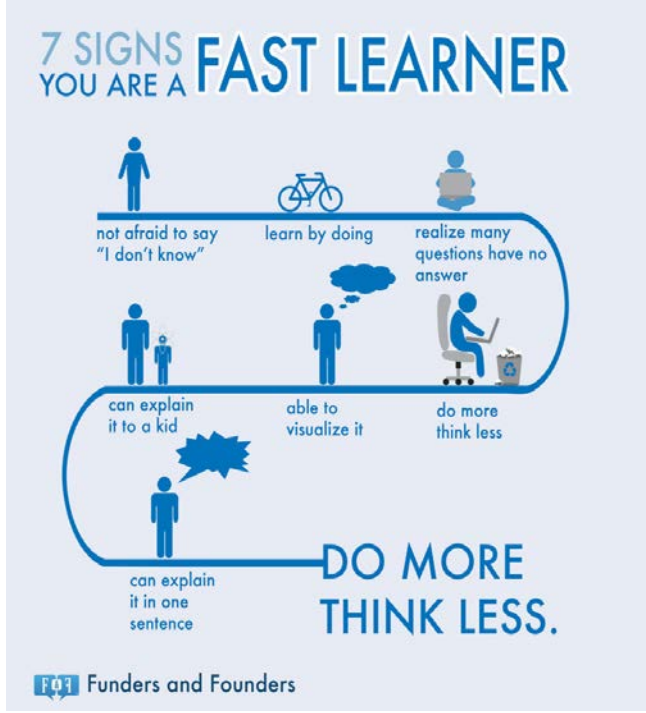
Practice



- UNIX
- putty (terminal)
- vi (editor)
- g++ (compiler) and helloworld.cpp

Assumption: You are using the Linux development environment

How to Learn Programming Languages - Fast!



Learn C++ Fast

Grasp both C++ Syntax and Semantics

Learn the programming environment

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Three steps to grasp both C++ Syntax and Semantics - Fast!

Actively speed read: tutorials and source code repositories

Implement: trial projects

Review: what you've accomplished

C++ Origins

- Low-level languages
  - Machine, assembly
- High-level languages
  - C, C++, ADA, COBOL, FORTRAN
- Object-Oriented-Programming in C++

C++ Terminology

- *Programs* and *functions*

- Basic Input/Output (I/O) with cin and cout

Display 1.1

A Sample C++ Program (1 of 2)

Display 1.1 A Sample C++ Program

```
1   #include <iostream>
2   using namespace std;

3   int main( )
4   {
5       int numberOfLanguages;

6       cout << "Hello reader.\n"
7            << "Welcome to C++.\n";

8       cout << "How many programming languages have you used? ";
9       cin >> numberOfLanguages;

10      if (numberOfLanguages < 1)
11          cout << "Read the preface. You may prefer\n"
12               << "a more elementary book by the same author.\n";
13      else
14          cout << "Enjoy the book.\n";

15      return 0;
16  }
```

Display 1.1
A Sample C++ Program (2 of 2)

SAMPLE DIALOGUE 1

```
Hello reader.
Welcome to C++.
How many programming languages have you used? 0
Read the preface. You may prefer
a more elementary book by the same author.
```

User types in 0 on the keyboard.

SAMPLE DIALOGUE 2

```
Hello reader.
Welcome to C++.
How many programming languages have you used? 1
Enjoy the book
```

User types in 1 on the keyboard.

Prepare Your Development Environment:

Three Candidate Environments

Linux Environment:
No IDE: vi, g++, gdb

Windows Environment:
Eclips IDE, MinGW or Cygwin

Mac OS Environment:
xCode IDE, Clang C++ compiler

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Computers

Computer Labs:
Windows PC and Mac

Your Laptop:
Windows, Linux, and Mac OS

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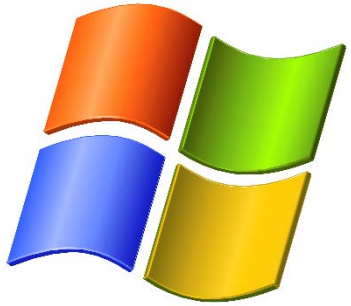
Using the CSSE Computer Labs

- Shelby Building 2119
- Shelby Building 2122
- For the Windows and Linux Environments



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Using the CSSE Computer Labs

- Shelby Building 2125
- For the Mac OS Programming Environment

Mac™ OS

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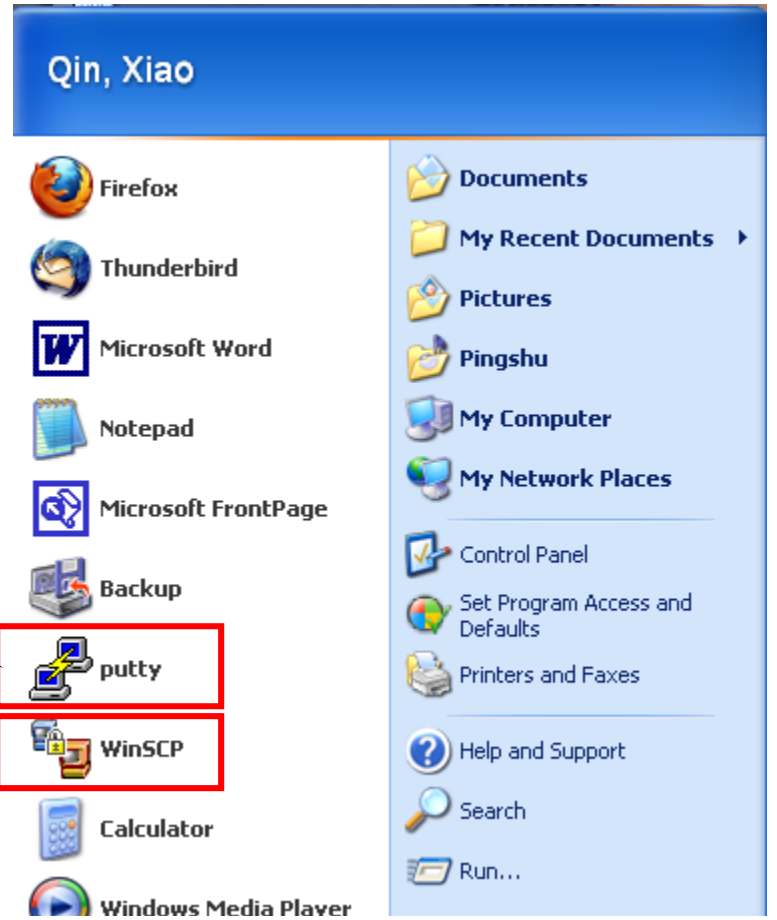
What you need on a Windows PC or Laptop for Linux Programming

- Option 1: Linux on remote Tux machines
  - Putty or secureCRT: Linux terminal on your windows PC
  - Text Editor on Linux: vi/vim
  - winSCP: Transfer files between your windows PC and a remote Linux server
- Option 2: Local Linux OS on your Laptop
  - Install Sun VirtualBox/VMWare on your laptop
  - In VirbutalBox, install Ubuntu (for Linux beginners), or
  - In VirbutalBox, install CentOS (for Linux developers).

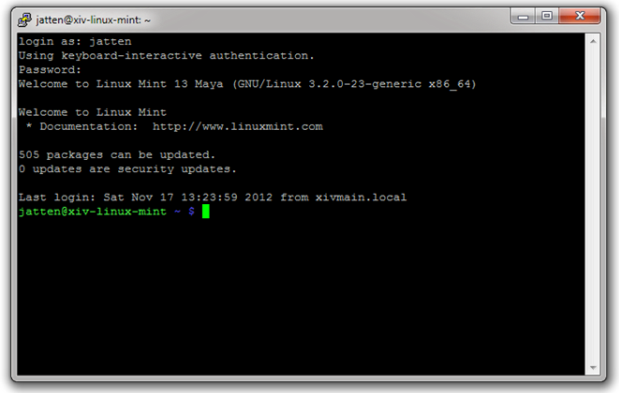
Secure Shell and FTP Clients

PuTTY is a free implementation of Telnet and SSH for Win32 and Unix platforms

WinSCP is a very flexible SFTP and SCP client for Windows



What is putty?



Local Laptop or PC

Remote Linux Server

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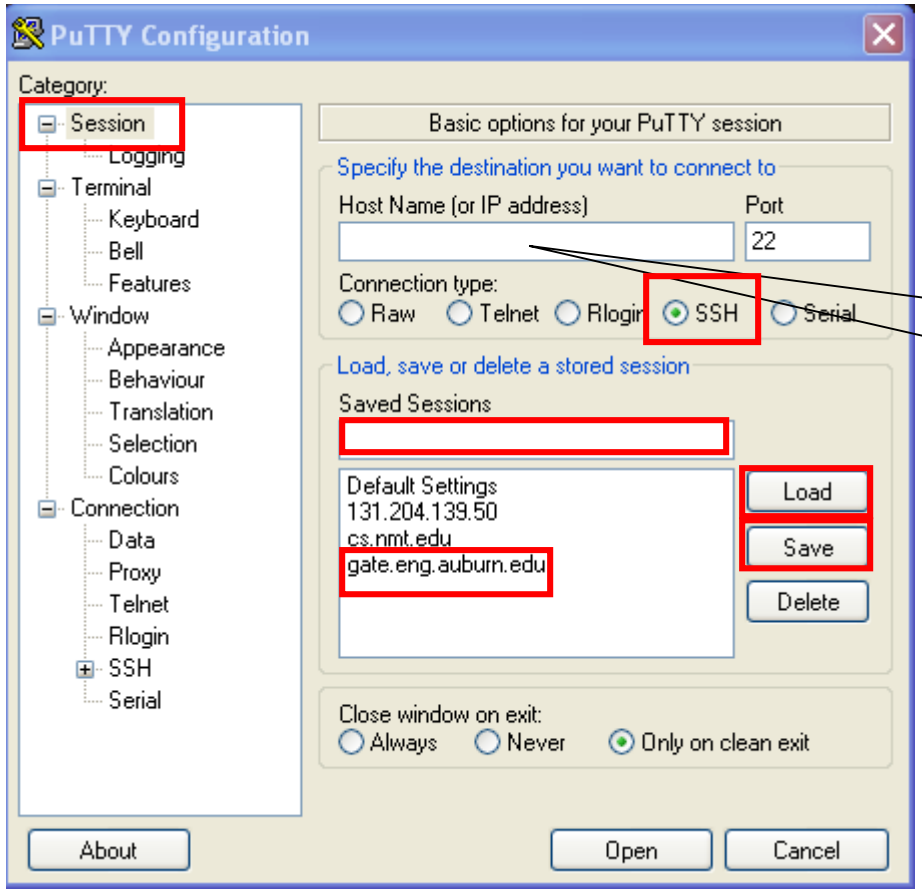
putty



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How about Mac OS for file transfer?

Install Filezilla2

Transfer Files

Local Mac Laptop

Remote Linux Server

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Text Editors

- Choose a text editor.
- Some determining factors:
  - What text editor is your professor using?
  - Are you a computer science major or not?
  - How much functionality do you want?
  - After the initial learning curve, how fast do you want to be able to edit?

Vi

- Vi is a feature rich editor located on almost all Unix/Linux machines around. Once learned, editing files is extremely fast.
- The downside:
  - It's more complicated than Pico.
  - It takes time to learn how to use vi.
  - It's easy to mess up your documents when you are first learning vi.

Vi and Bike

Photo Courtesy of David and Kelly Godzwa

Photo Courtesy of http://www.thejustinbowers.com

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Once you learned it, you don't want to walk anymore …

Photo Courtesy of [Daniel Moyer Photography]

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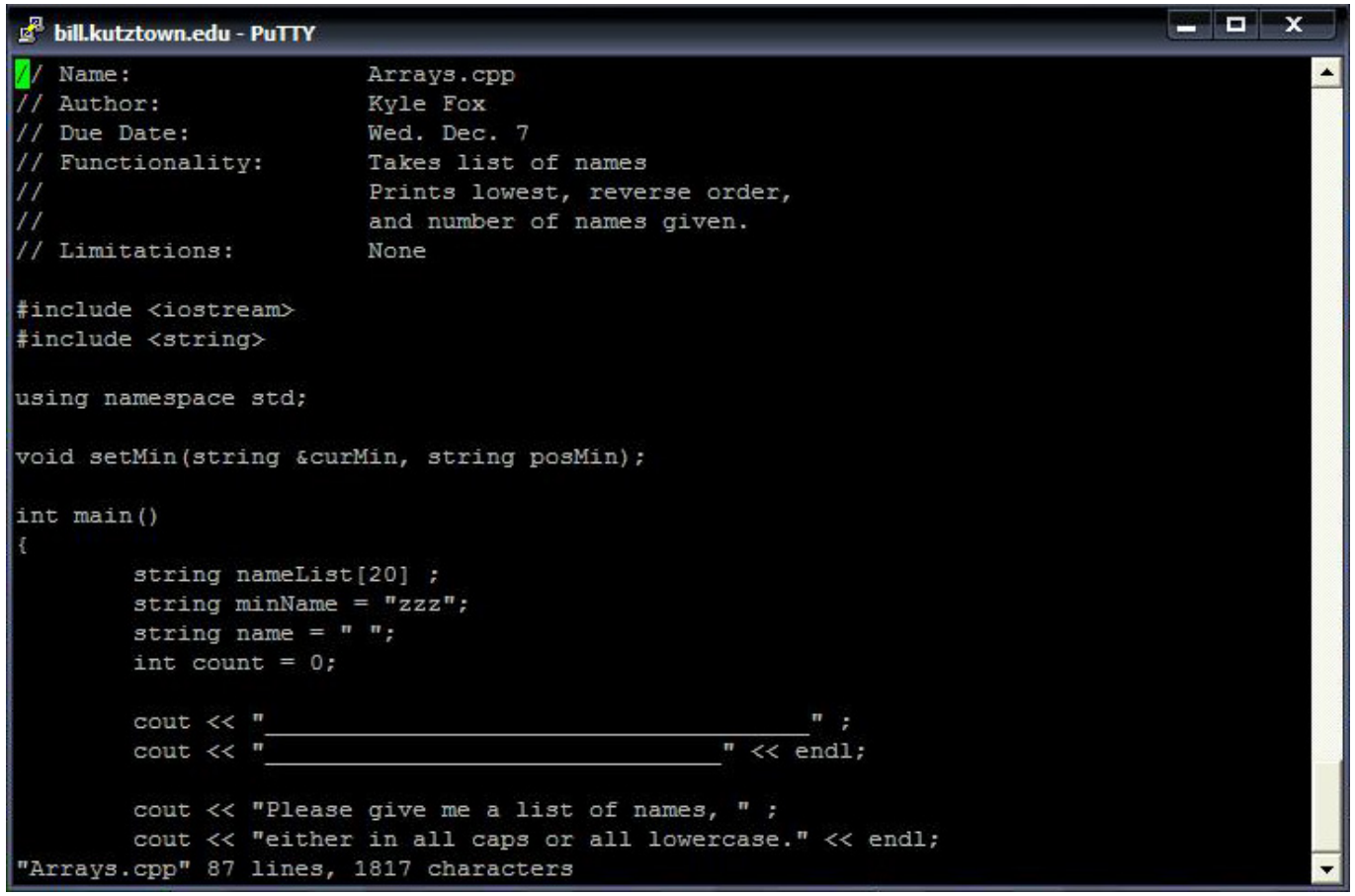
Vi Basics (1)

- There are three modes to vi:
  - Command mode (you start in this mode)
    - It is used for entering commands
    - The escape key always gets you back to command
  - Insert/Append mode
    - It is used for inserting or appending text
    - From command mode, “a” will get you append mode, and “i” will get you insert mode.
  - Line mode
    - The “:” from command will get you to line mode.
    - It is used for controls like saving and exiting.

Vi Basics (2)

- Open a file using "*vi the_file*".
- Save using "w" (write) from line mode.
- Quit using "q" (quit) from line mode.
- Combine the two to save and quit "wq".
- Go to line using "#a_number" from line mode.
- Delete a character using "x" from control mode.
- Delete a line using "dd" from control mode.

Vi Image



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Compiling a C++ Program

- To compile a c++ program, use the g++ command. "*g++ helloworld.cpp*"
  - Provided there are no errors, this will create an executable file called a.out.
  - If you want to name your executable file, use the -o flag to specify a name. "*g++ helloworld.cpp -o helloworld.out*"

Running a C++ Program

- Running a c++ program is easy, just type in the name of the executable file!
  - "*a.out*"
- There could be a minor issue however. If for some reason, that doesn't work, try preceding the name with a ./
  - "*./a.out*"