COMP 2710
Software Construction

Prepare Your Development 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++

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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What you need on your Mac/Linux for Linux Programming

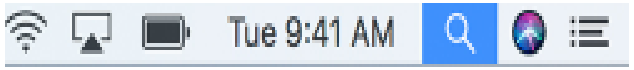
Communication

Local Mac/Linux Laptop

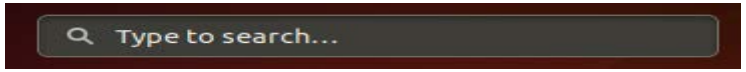
Remote Linux Server

Terminal: (Mac/Linux)

- Mac
  - Boot your computer -> click a “search” icon on the top right corner -> type “terminal” -> click “Enter”



- Linux
  - Boot your computer -> click a “search” icon on the top/bottom left corner -> type “terminal” -> click “Enter”



- Please type “terminal”

What you need on your Windows for Linux Programming

Local Windows

Remote Linux Server

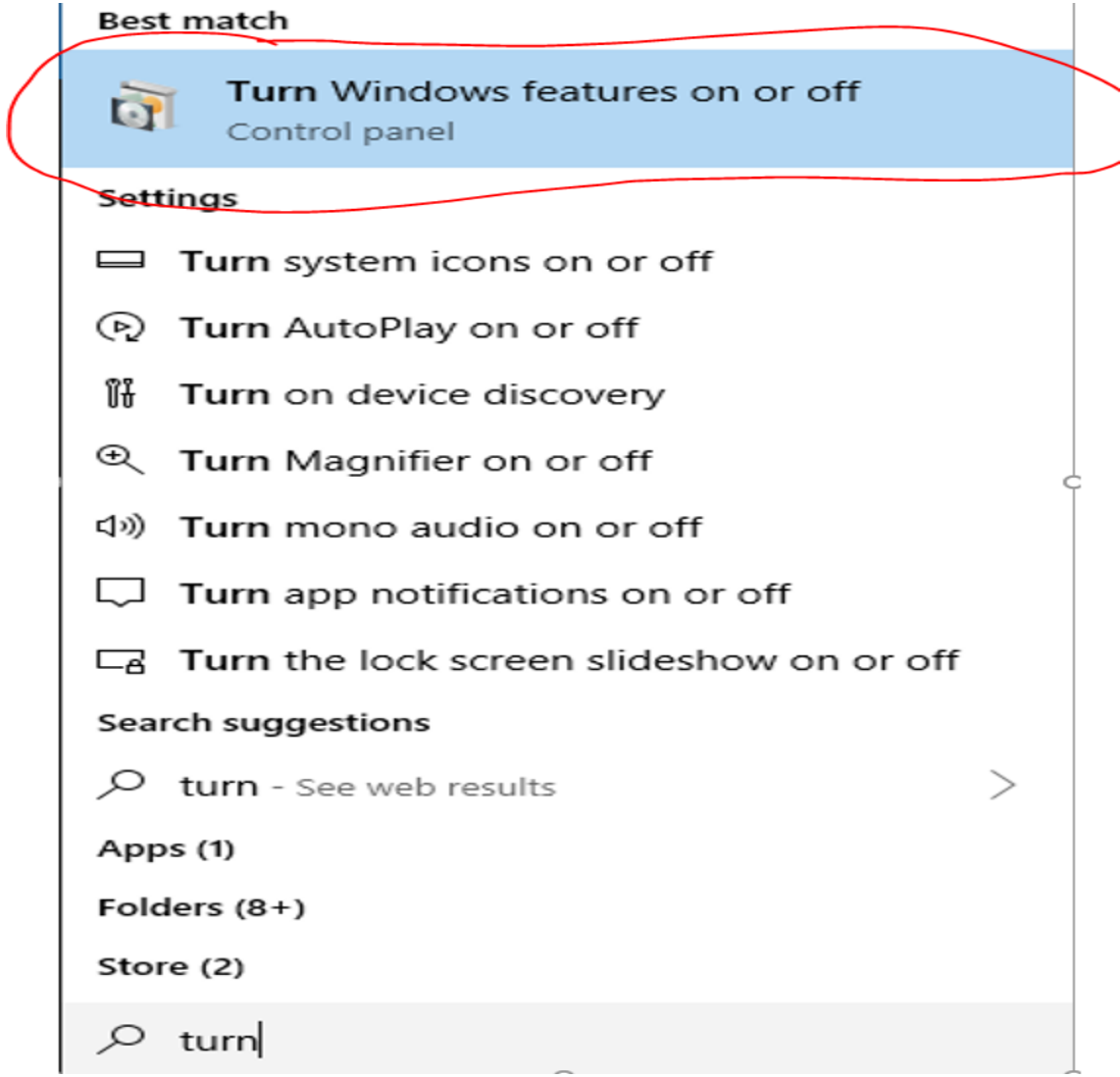
Terminal: (Windows)

- Option1: Boot your computer -> press Win+S -> type “cmd” -> click “Enter”
- Option2: Boot your computer -> press Win+S -> type “Window PowerShell” -> click “Enter”

Terminal: (WinSub)

- Option3

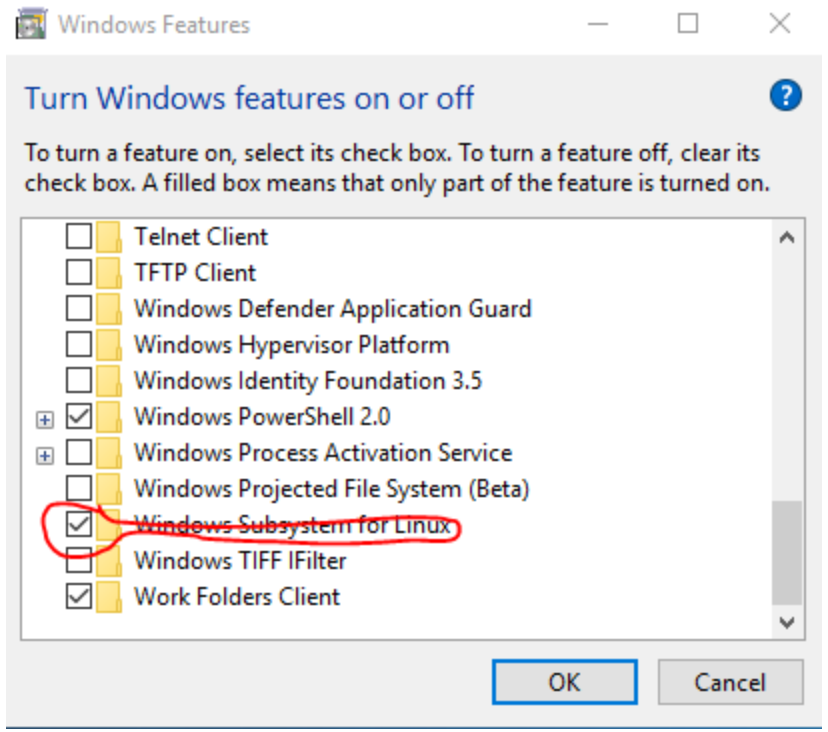
1. Under a search bar, type “Turn Windows feature on or off” and enter it.



Terminal: (WinSub)

- Option3

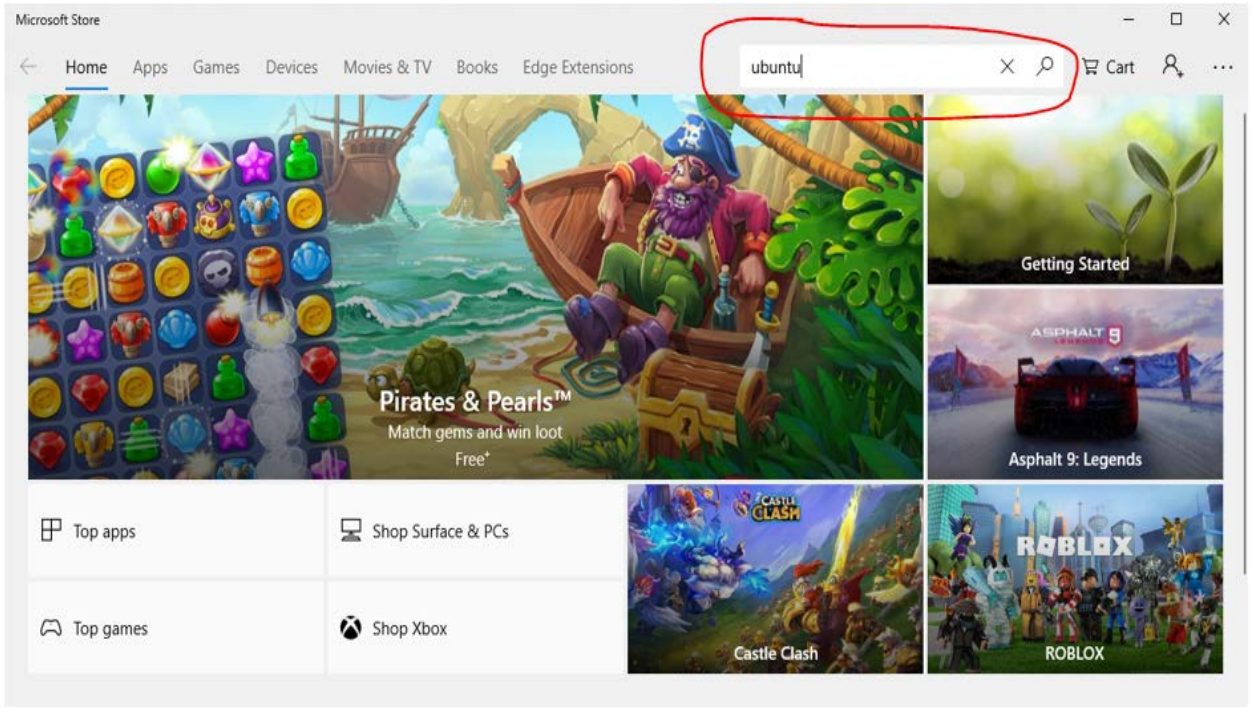
2. Please check the box of “Windows subsystem for Linux” and click OK.

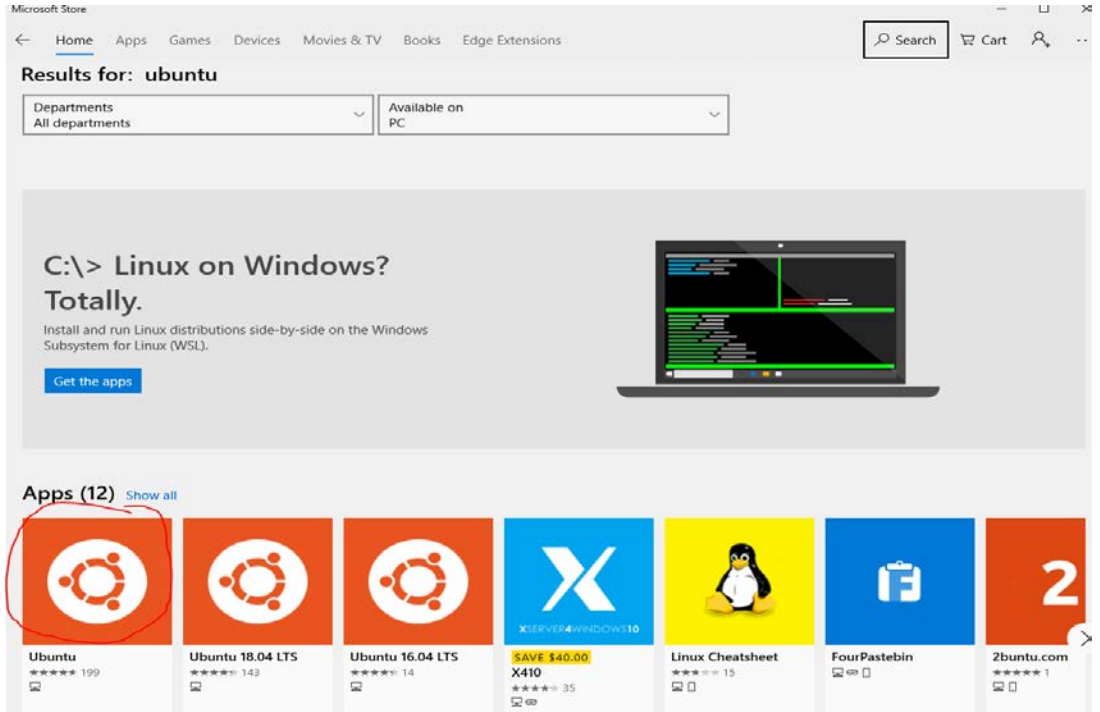


Terminal: (WinSub)

- Option3

3. Launch “Window store”.

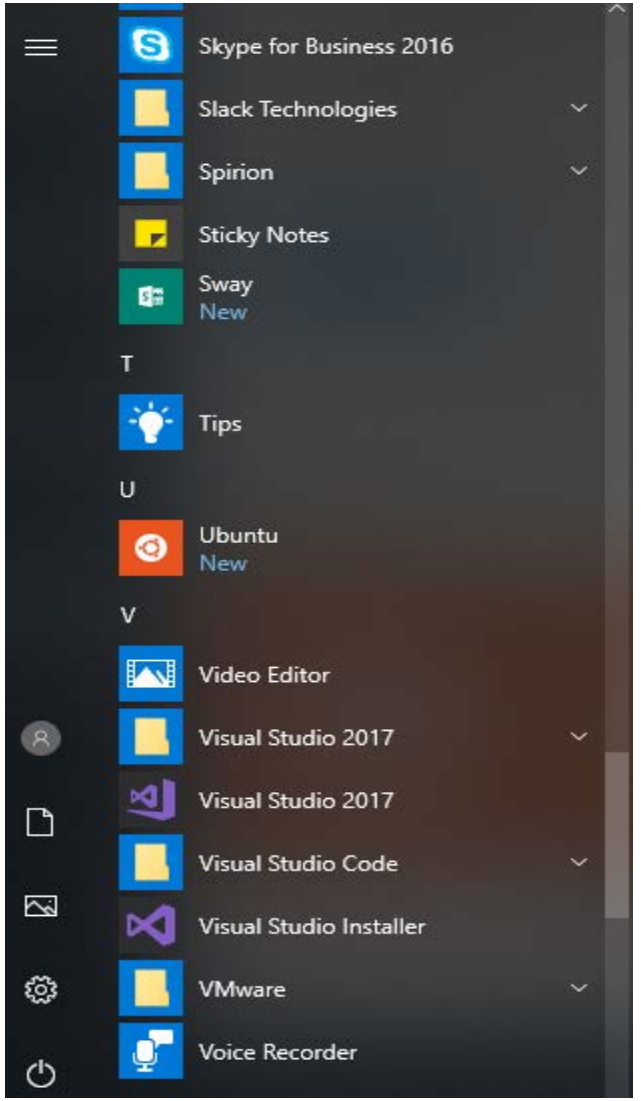




Terminal: (WinSub)

- Option3

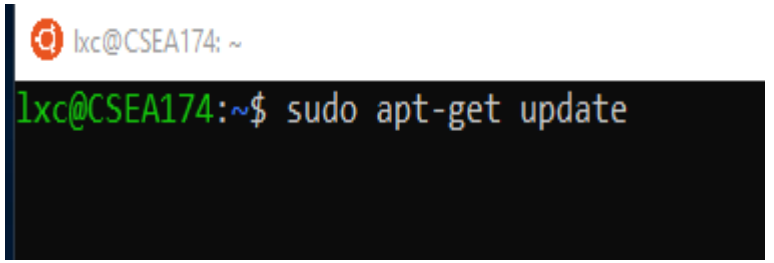
4. Click a “start” button and launch your “Ubuntu”.



Terminal: (WinSub)

- Option3

5. On your “Terminal”, please type “sudo apt-get install update” to get a latest version.



Login

- In your “Terminal”, type “AUusername@gate.eng.auburn.edu” -> click “Enter”.
- You will receive the following info: AUusername@gate.eng.auburn.edu’s password:->type your AU password -> click “Enter”
- You will receive a “Welcome” info and require you to select a proper machine. Leave it blank and click “Enter”

Login

Welcome to Ubuntu 14.04.5 LTS (GNU/Linux 3.13.0-164-generic x86_64)

* Documentation: https://help.ubuntu.com/

New release '16.04.5 LTS' available.

Run 'do-release-upgrade' to upgrade to it.

Last login: Thu Jan 10 19:30:49 2019 from csea174.eng.auburn.edu

.....

.....

Please enter the name of an Engineering host <anywhere>:

Permission

1. pwd
2. cd ../
3. chmod go-rwx yourAUAccount
   - ✓g-group
   - ✓o-other
   - ✓r-read
   - ✓w-write
   - ✓x-execute
   - ✓d-directory

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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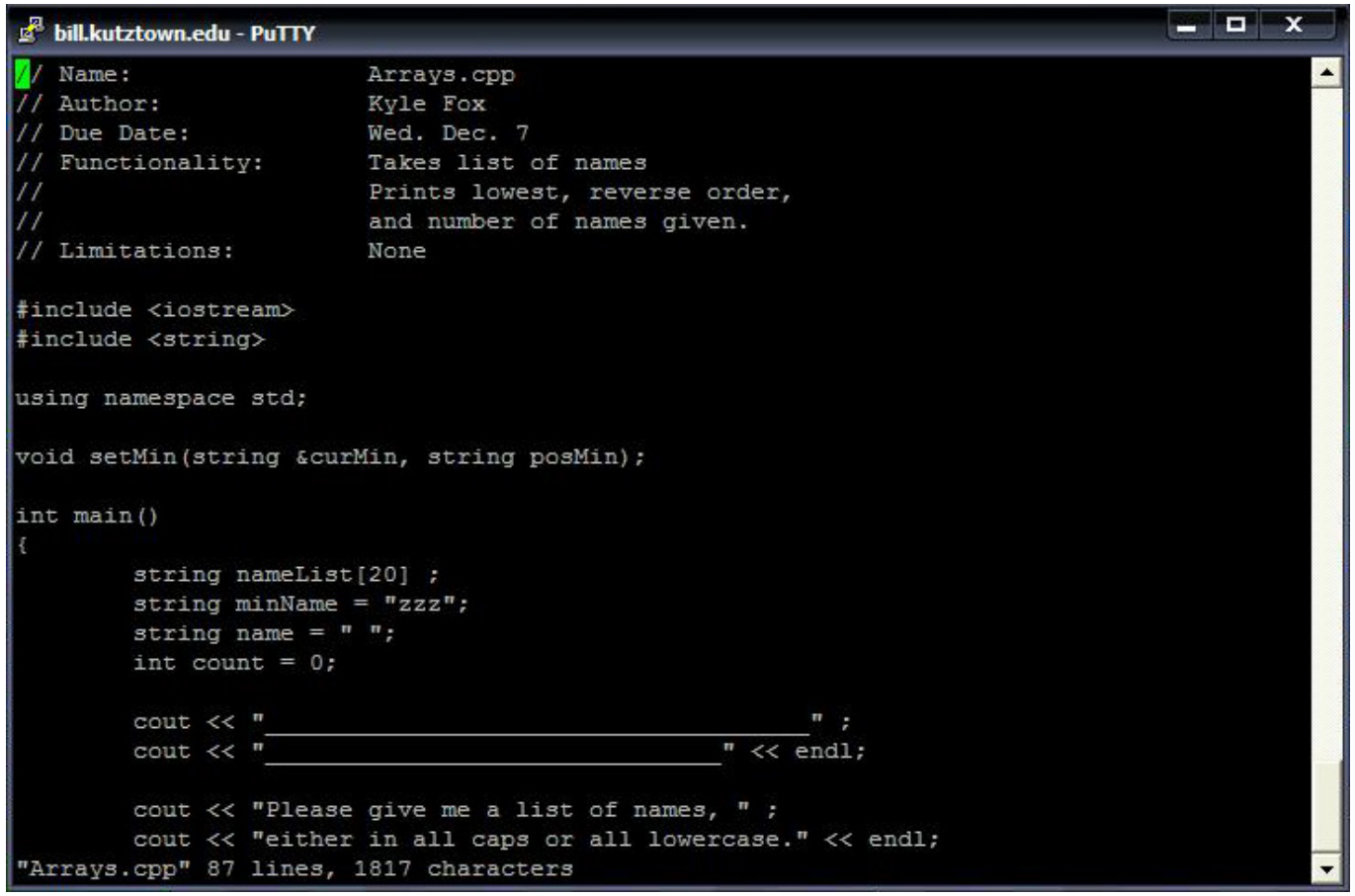
Vi Basics (1)

- 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*"

Core Files

- If for some reason, you have a very bad error happen when you run your program, you may end up with a core dump.
- What happens is that Unix saves all information about what happened to a file named “core”.
- Make sure if this happens to you, that you remove the core file, because they are big, and can take up a lot of your space!

Download/Upload

- Syntax: scp [location of source files] [destination]

  i.e. Mac/Linux

  scp xzl0031@scp.eng.auburn.edu:/home/cse_h1/xzl0031/helloworld.cpp ./

  Windows:

scp /mnt/c/Users/xzl0031/Desktop/test.cpp xzl0031@scp.eng.auburn.edu:/home/cse_h1/xzl0031

.tar.gz (multiple files)

- Syntax: tar –zcvf favorite_name.tar.gz /folder/directory
- i.e. tar –zcvf Quiz1_xzl0031.tar.gz /home/cse_h1/xzl0031/COMP2710/Quiz1