# C++: Syllabus & Introduction

# Assignments

- Read All “1_” readings in the readings folder
- Please install and set up Microsoft Visual Studio 2015.
- Please demonstrate creating, compiling and running a program which prints ‘hello world’.
- Please demonstrate how to set a breakpoint and view variable contents using Visual Studio 2015.
- See Assignments folder
- Due Friday 9/2 by noon

# Outline

- Course Introduction
- C++ Introduction

# Who I am

- Instructor: Keith Perkins
- Office: Luter 203
- Office Hours: 10:00 - 11:30 M, W
- 12:15 – 1:15 Th
- 10:00 – 12:00 F
- Office Phone: 594-8425
- Email: keith.perkins@cnu.edu

# Notes, Lectures, Assignments, Videos …

- Scholar
- Note in particular;
  - The C++ Reference section.
    - Get the C++ Quick Reference and use it
  - The Readings section
    - You are responsible for these

# Syllabus: Prerequisites

- CPSC 250 or equivalent
- Textbook – Any C++ text
- Suggestions:
  - Absolute C++ 5th edition, Walter Savitch
  - C++ Programming Language, Stroustrup
- References to make you a better programmer
  - Effective C++, Scott Meyers
  - More Effective C++ , Scott Meyers
  - Effective STL, Scott Meyers
  - Effective Modern C++, Scott Meyers

# Syllabus: Major Topics
## (Subject to change)

- Week 1 — Intro, Market share, Compilation, Visual Studio introduction
- Week 2, 3 — Some C++ Syntax, Standard Library, Strings
- Week 4 — Headers, functions, Streams, Structs, Enums
- Week 5 — Standard Library iterators and Lists, Preprocessor directives
- Week 6, 7 — Pointers, References, Memory
- Week 8 — Classes, operators, memory management using RAII 
- Week 9 — Exceptions
- Week 10, 11 — Inheritance, operator overloading, virtual heiarchys
- Week 12,13 — Concurrency and Threading
- Week 14 — Registers, Memory, profiling

# Syllabus: Assignments

- Project 1 - 50  points - Install and demo Visual Studio
- Project 2 - 100 points - File I/O
- Project 3 - 100 points - STD library containers and Sorting
  Project 4 - 200 points - Using libraries and parsing strings
- Project 5 - 250 points – Polymorphism
- Project 6 - 300 points – An Encrypting database

# Syllabus : Evaluation

- 1 Midterm Test
- 1 Final
- Numerous projects
- See Syllabus for details

- This will be a rigorous course. Please start projects early.

# Development Environment

- Visual Studio 2015

# What you will learn

- Standard (mostly) C++ - to a level of proficiency so you can function professionally, you will not be an expert.
- Some of the C++ syntax
- Coding suggestions and Guidelines to make you a better programmer.
- how to use an IDE, how to use libraries, how to approach and solve programming problems

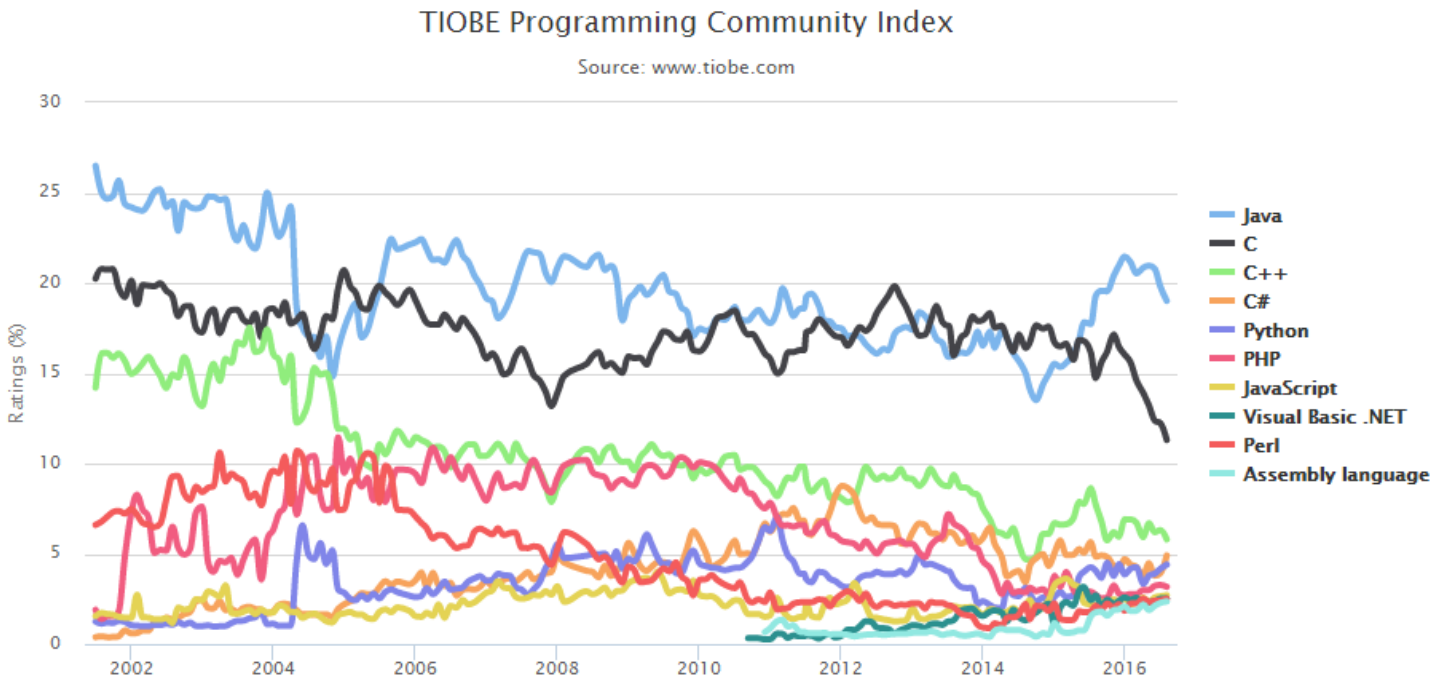
# What you will NOT learn

- User Interface (UI), networking– UI is platform dependent, networking is too advanced for intro class (and is MUCH harder in C++ than Java)

# Outline

- Course Introduction
- C++ Introduction

# C++ Usage




see http://www.tiobe.com/index.php/content/paperinfo/tpci/index.html

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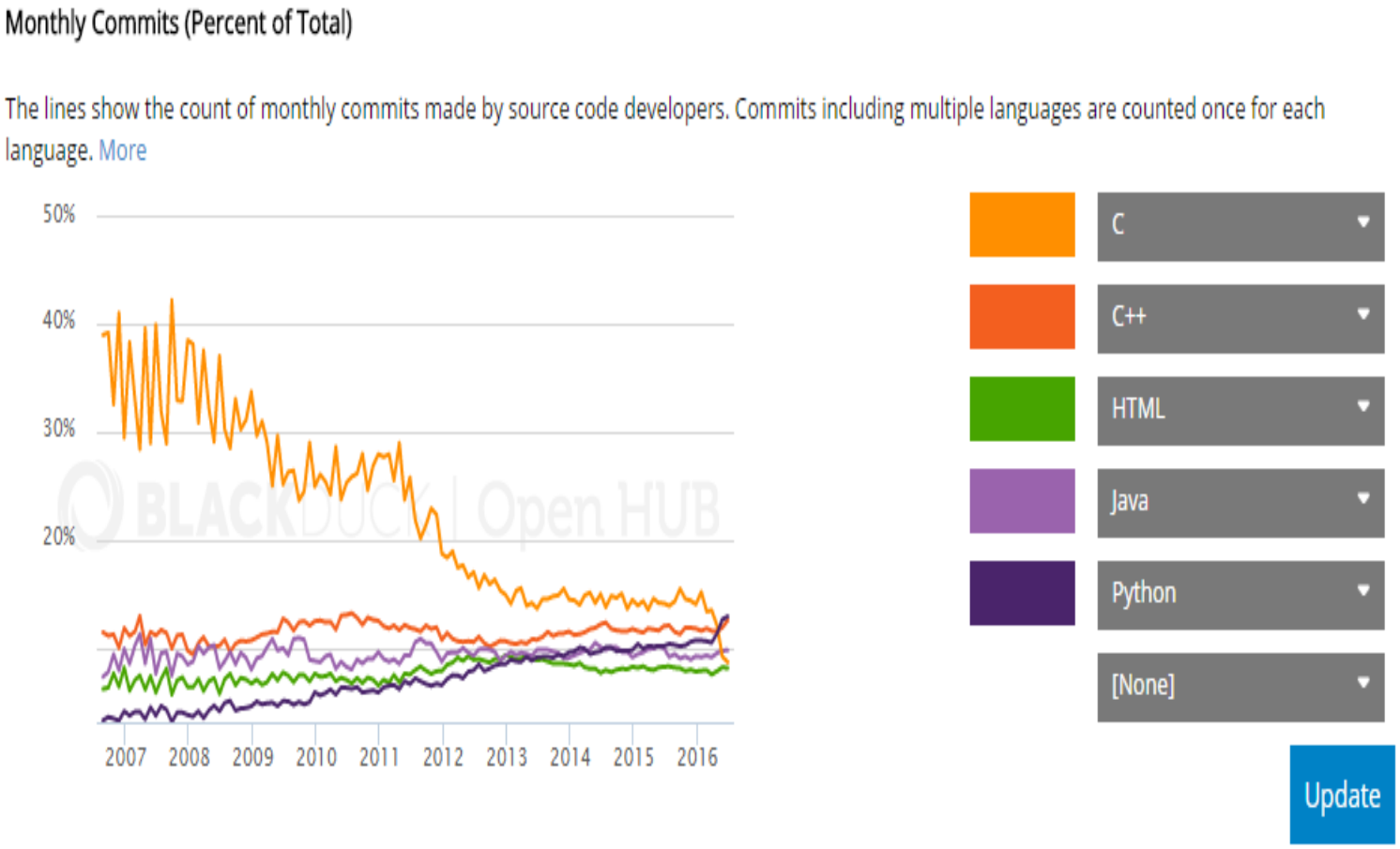


See https://www.openhub.net/languages/compare

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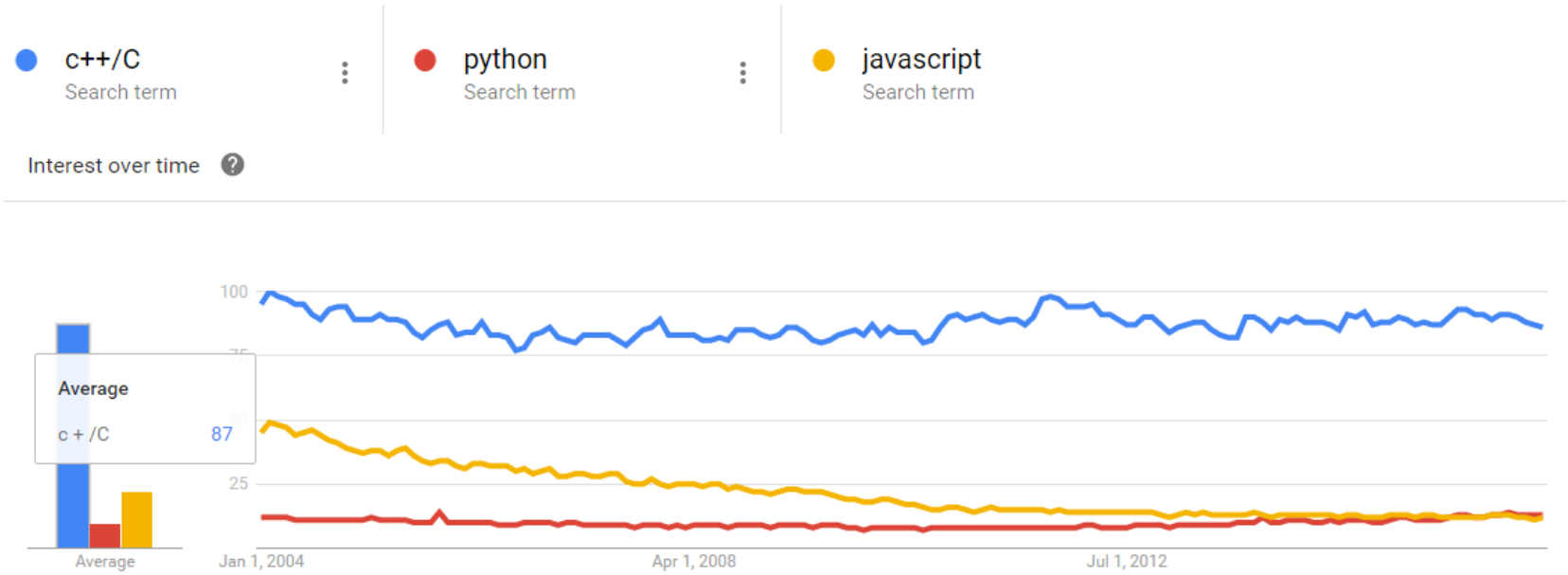


See https://www.google.com/trends/explore?date=all&q=c%2B%2B%2FC,python,javascript

# C++ … Why?

- Fast
- You have absolute control over everything
- Elegant when done well
- Only choice for some situations
  - High speed trading
  - Google search
  - Embedded systems
  - Real Time Processing
- Low level control

# C++ … Why not?

- Harder to code than languages that run on a VM (Java, C#)
- No garbage collection, pointers can be (and usually are) a problem
- Must be compiled to target platform, no portable bytecode
- My experience – My Java apps are up and running much faster than my C++ apps.

# C++ … Where is it used?

- Device driver development
- Video Games
- Advanced engines (audio, image processing, etc)
- Telecom
- Embedded software
- Financial - low latency market data feeds
- Google
- Real time video processing

# I know Java why bother?

- Speed
- Software now targets distributed applications
  - Rich user interfaces
  - Cloud storage
  - Mobile Applications
  - Big Data
- Today, applications require expertise in multiple languages

# But… I don’t know most of that stuff

- Don’t worry, you aren’t expected to.
- You learn on the job (while getting paid)