

C++: Syllabus & Introduction

Outline

- Course Introduction
- C++ Introduction

Who I am

- Instructor: Keith Perkins
- Office: Luter 207
- Office Hours: 10:00 - 11:00 M, W
- 1:15 – 3:00 T
- 10:00 – 12:00 F
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Notes, Lectures, Assignments, Videos ...

- Assignments on Scholar
- Everything else on webpage
<https://cnuclclasses.github.io/CPSC327/>
- Note in particular;
 - The Lectures/Readings section
 - You are responsible for everything here
 - The Examples section
 - Understand these

Assignments

- Read All week 1 readings
- Please install and set up Eclipse CDT
- Please go to projects section of website
 - Complete Project 1 by due date
 - Mind the submission format (you will use this to import my projects)

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 RAI 
- Week 9 Exceptions
- Week 10, 11 Inheritance, operator overloading, virtual heierarchy
- Week 12,13 Concurrency and Threading
- Week 14 Registers, Memory, profiling

Syllabus: Assignments

- Project 1 - 50 points - Install and demo IDE
- 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

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

- Eclipse CDT

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



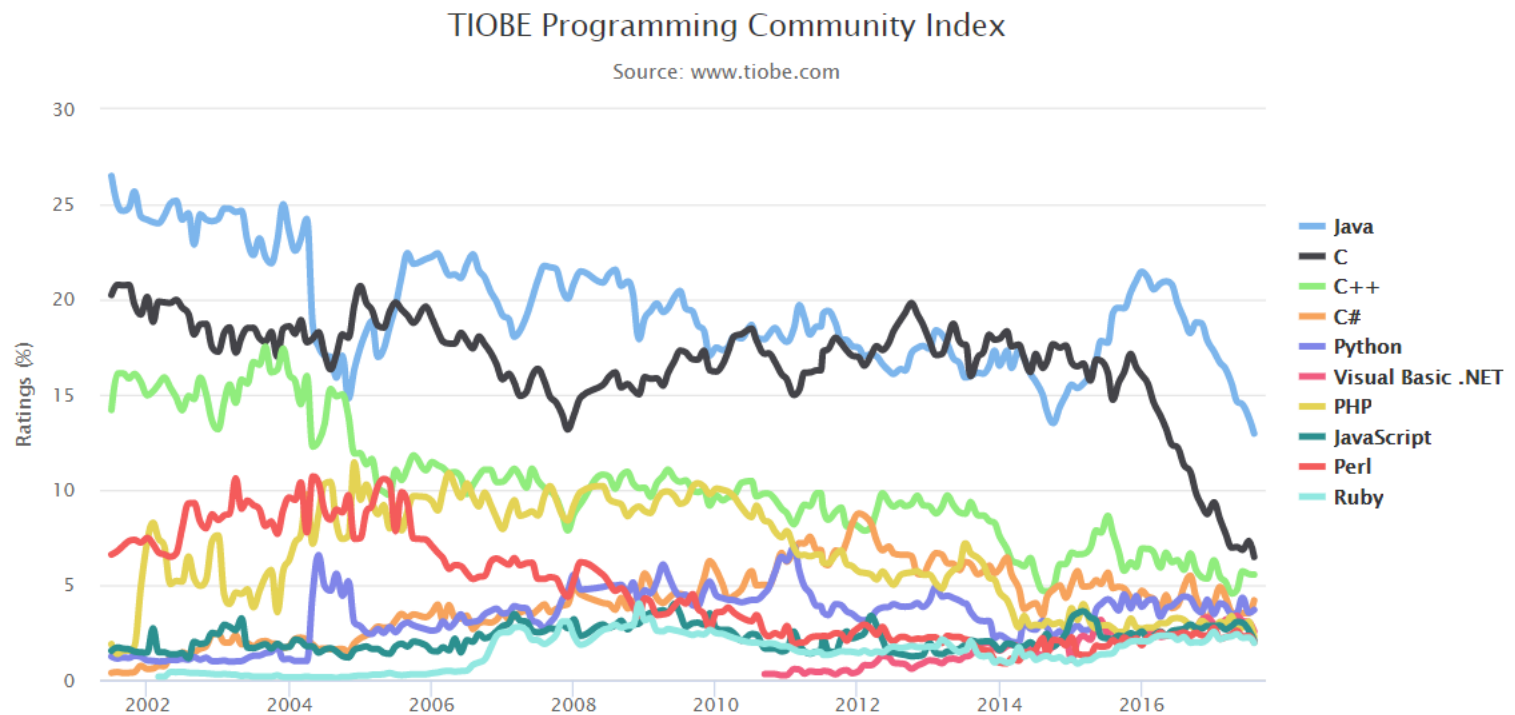
What you will NOT learn

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

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C++ Usage

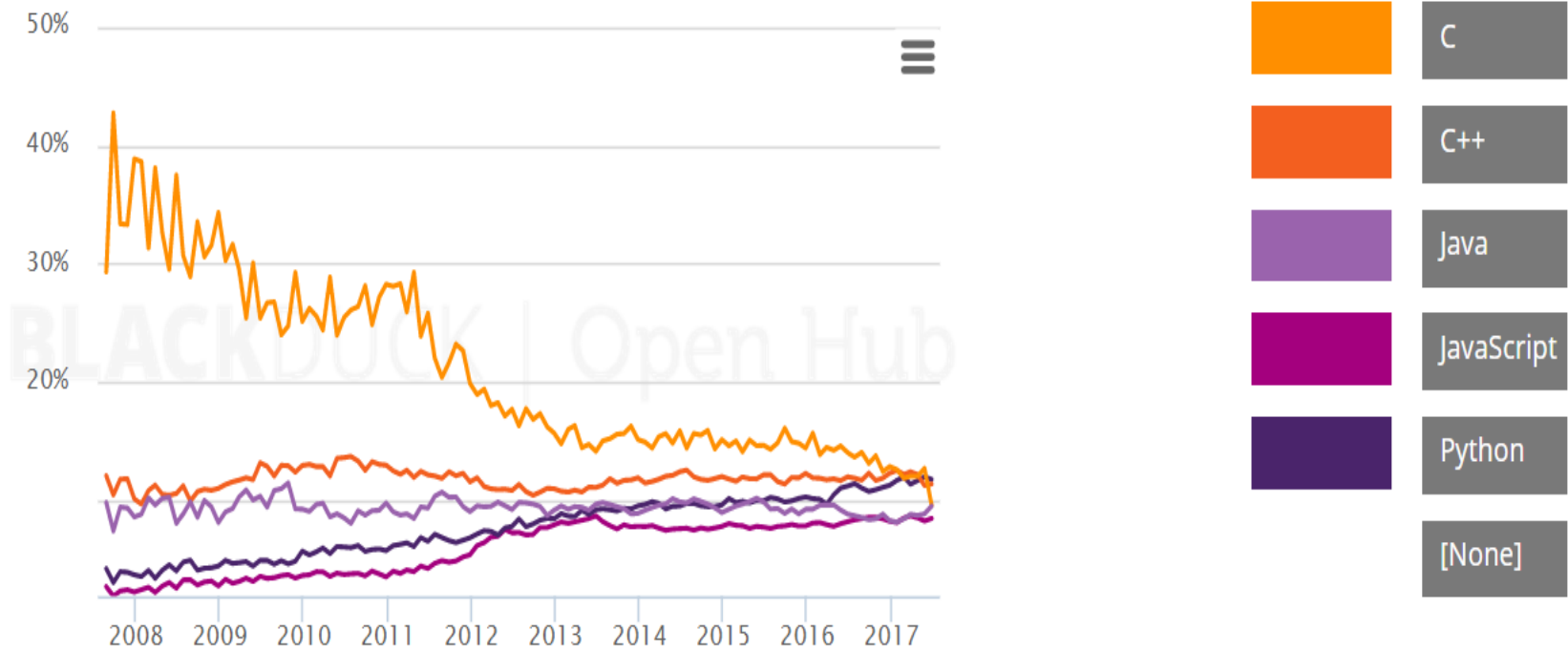


see <http://www.tiobe.com/index.php/content/paperinfo/tpci/index.html>

C++ Usage

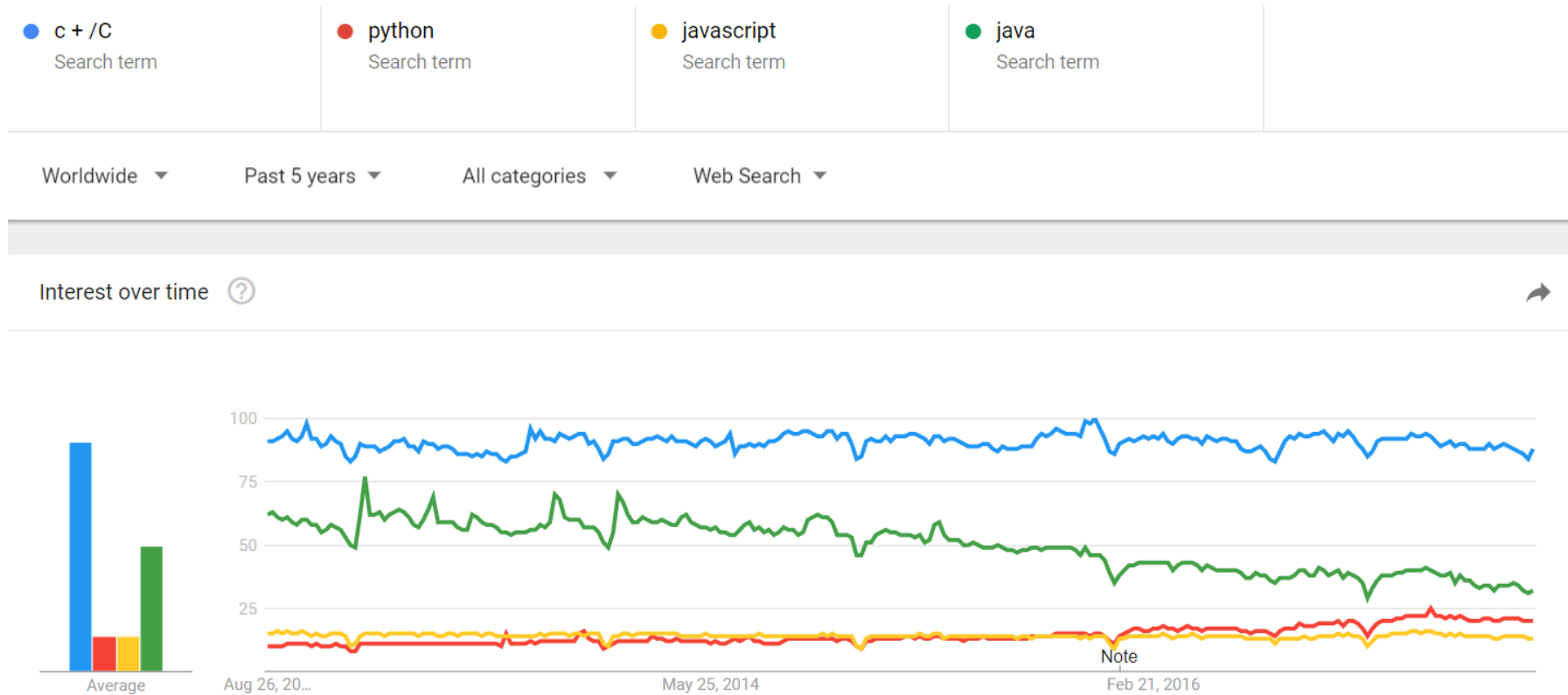
Monthly Commits (Percent of Total)

The lines show the count of monthly commits made by source code developers. Commits including multiple languages are counted once for each language.



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

C++ Usage



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)