Lecture #1 | Introduction to C, C++ and OOP

SE271 Object-oriented Programming (2017)

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Today's topic

- A brief introduction of C/C++

Why C++?

- Popularity: one of the largest code base
- Performance: the main development language for many system/ applications that require good performance
- Flexibility: low-level to high-level
- Productivity: libraries and development tool support

TIOBE Index for August 2017

Aug 2017	Aug 2016	Change	Programming Language	Ratings	Change
1	1		Java	12.961%	-6.05%
2	2		C	6.477%	-4.83%
3	3		C++	5.550%	-0.25%
4	4		C#	4.195%	-0.71%
5	5		Python	3.692%	-0.71%
6	8	▲	Visual Basic .NET	2.569%	+0.05%
7	6	▼	PHP	2.293%	-0.88%
8	7	▼	JavaScript	2.098%	-0.61%
9	9		Perl	1.995%	-0.52%
10	12	▲	Ruby	1.965%	-0.31%

Source: https://www.tiobe.com/tiobe-index/

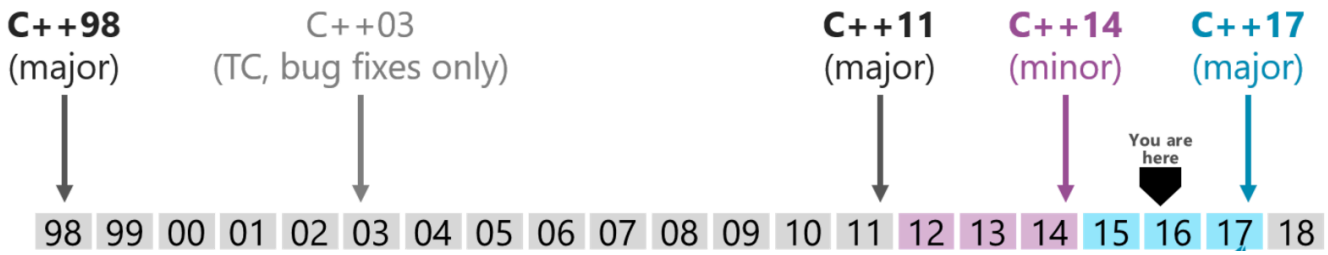
https://spectrum.ieee.org/computing/software/the-2017-top-programming-languages

The 2017 Top Programming Languages

Language Rank	Types	Spectrum Ranking
1. Python		100.0
2. C		99.7
3. Java		99.5
4. C++		97.1
5. C#		87.7
6. R		87.7
7. JavaScript		85.6
8. PHP		81.2
9. Go		75.1
10. Swift		73.7

History of C/C++

- B.C. Early languages, e.g., Fortran, Cobol, Algol, PL/I
- 1970 Kernigham and Ritchie invents C (K&R C)
- 1980 Bjarne Stroustrup creates "C with classes"
- 1983 "C with classes" is renamed as "C++"
- 1989 The C standard is ratified (ANSI C, C89)
- 1995 The ANSI committee releases a draft of the C++ standard
- 1998 An official C++ standard is adopted (C++98)
- 1999, 2011 The C standard is updated (C99, C11)
- 2003, 2011, 2014 The C++ standard is updated (C++03, C++11, C++14)



What is defined in the C++ standard?

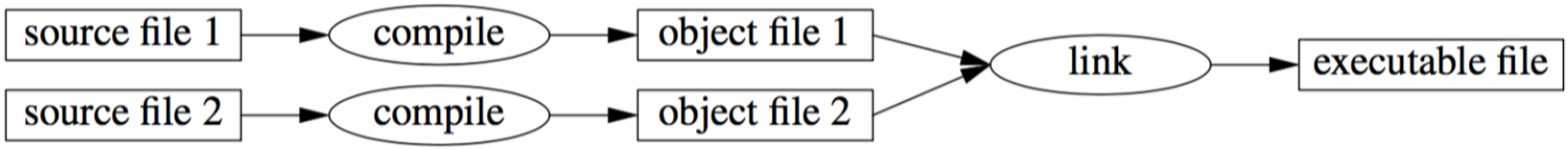
- Core language features, a.k.a., the C++ syntax
  - Built-in types
  - Control statements (e.g., for, and while)
  - …
- Standard-library components
  - Containers (e.g., vector, map)
  - I/O operation (e.g., <<, getline())
  - Standard template library (STL)
  - ...

Design goal of C++

- C++ is a general-purpose programming language that
  - is a better C
  - supports data abstraction
  - support object-oriented programming
  - supports generic programming

C++ is a compiled language

- C++ source codes should be compiled (and linked) into machine language for execution



- We need to generate machine language for each processor, OS (and often times) and library combination
- During this course, each student is expected to set up his/her own development environment
- You can also use elice.io for easier access/assignment submission

Reading list

- Syllabus including reference list
- Learn C++
  - Chapter 0: 1, 2, 3
  - Chapter 1: 1, 2, 3, 3a, 5
  - Chapter 2: 1, 3
- Unix: https://www.facebook.com/engineertoon/posts/512251568961703

Assignment #0

- Due: 9/11 Monday
- "Hello, world!" on elice
  - Register to dgist.elice.io: Use dgist email address and Korean first & last name
  - Subscribe to Object-Oriented Programming
    - Subscription password: dgist_2017_oop
- Complete assignment #0 on elice (will be posted until this Wed.)
- Set up your own development environment on your notebook, e.g.,
  - Visual Studio for Windows, macOS and Linux
  - Xcode for macOS
  - g++ or clang++ (command line compilers) for Linux, macOS and Windows

ANY QUESTIONS?