159.234 Object Oriented Programming

Welcome to 159.234

Semester 1, 2015

159.234 Object Oriented Programming

Today

- What is OOP?
- C review
- Administrivia
  - Course overview
  - Health & Safety
  - Class representative

What this course is about?

What is a programming paradigm?
What programming paradigms do you know?

What is Object Oriented Programming?

What is C++?
What is Java?

What this course is about?

You'll discover:

- Fundamental programming concepts
- Key useful techniques
- **Basic** Standard C++ and Java facilities

After the course, you'll be able to

- Write small C++/Java programs
- Read much larger programs
- Learn/use the advanced features of these languages by yourself

After the course, you will ***not*** (yet) be

- An expert OO programmer
- A C++/Java language expert
- An expert user of advanced libraries

What is OOP?

A programming style in which programmers define **abstract data type consisting of**

- **data** and
- **operations** that can be applied to data.

Main features:

- Encapsulation
- Inheritance
- Polymorphism

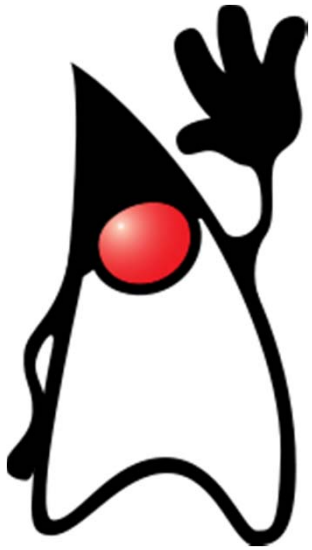
C++/Java

http://en.wikipedia.org/wiki/

C++

Paradigm(s)	Multi-paradigm:[1] procedural, functional, object-oriented, generic
Designed by	Bjarne Stroustrup
Appeared in	1983
Stable release	ISO/IEC 14882:2011 / 2011
Preview release	C++14 / 2014
Typing discipline	Static, Nominative
Major implementations	LLVM Clang, GCC, Microsoft Visual C++, Intel C++ Compiler
Influenced by	C, Simula, ALGOL 68, Ada, CLU, ML
Influenced	Perl, LPC, Lua, Pike, Ada 95, Java, PHP, D, C99, C#,[2] Falcon, Seed7
Implementation language	C++
OS	Cross-platform (multi-platform)
Filename extension(s)	.cc .cpp .cxx .c++ .h .hh .hpp .hxx .h++
Website	News, status & discussion about Standard C++

C++ Programming at Wikibooks



Java

Paradigm(s)	multi-paradigm: object-oriented, structured, imperative, functional, generic, reflective, concurrent
Designed by	James Gosling and Sun Microsystems
Developer	Oracle Corporation
Appeared in	1995[1]
Stable release	Java Standard Edition 8 Update 5 (1.8.0_5) / April 15, 2014; 2 months ago
Typing discipline	Static, strong, safe, nominative, manifest
Major implementations	OpenJDK, many others
Dialects	Generic Java, Pizza
Influenced by	Ada 83, C++, C#,[2] Eiffel,[3] Generic Java, Mesa,[4] Modula-3,[5] Oberon,[6] Objective-C,[7] UCSD Pascal,[8][9] Smalltalk
Influenced	Ada 2005, BeanShell, C#, Clojure, D, ECMAScript, Groovy, J#, JavaScript, Kotlin, PHP, Python, Scala, Seed7, Vala
Implementation language	C and C++
OS	Cross-platform (multi-platform)
License	GNU General Public License, Java Community Process
Filename extension(s)	.java , .class, .jar
Website	For Java Developers

Java Programming at Wikibooks

C++

Most of C is a subset of C++, so most C programs can be compiled using a C++ compiler.

How does the compiler recognize a C++ program?

programName.c for C programs

programName.cpp **for C++programs**

A C++ program

The world's first "real program" running on a **stored-program** computer (David Wheeler, Cambridge, May 6, 1949)

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

int square (int);

int main(){
    int i=0;
    while(i<100){
       cout<<i<<'\t'<<square(i)<<'\n';
       ++i;
    }
    return 0;
}
int square(int a){
   return a*a;
}
```

Your knowledge of C

Data types
Variables
Conditional statements (`if, switch`)
Iterations (`for,while, do`)
IO (standard devices, files)
Functions, passing parameters
Arrays
Structures
Pointers

Quick quiz -- 5 mins

1. Your ID
2. List all programming languages you have used (more than 3 month)?

3. Write C statements…

When and who?

Lecturer **Dr. Elena Calude**
Office hours: **Wed 11:15 -12:15,**

Room IIMS **3.18**
Email: **E.Calude@massey.ac.nz**

Tutor : TBA

Lectures:
Mon 15:00-15:50 (AT7)
Tue 14:00-14:50 (AT6)
Wed 10:00-10:50 (AT7)

Tut Fri 13:00-13:50 (CLQB5**)**

If a student cannot attend lectures/labs it is the student's responsibility **to find out what was discussed in lectures / labs (**possible changes to assignments, questions & answers**).**

Important!

Sample solutions for assignments/labs will be discussed ONLY **during lectures/labs/office hours--no materials on Stream and no hand-outs for sample solutions** -ask a friend what was presented in class, if you cannot attend.

Each lecture will have minor mistakes - to keep you alert!
Find them and be rewarded!

Otherwise by the end of the lecture we will discuss the corrections ☺.

What do you need?

Stream access

Software

1) **C++ compiler for Windows; the GCC compiler and a Text Editor (SciTE)**
http://cs-alb-pc3.massey.ac.nz/software/gcc48.exe
2) Java http://java.com/en/download/manual.jsp

Practice

Solve all assignments
Tut/lab exercises -during Tut/lab sessions
Past Exams: from Library/on the web

May be- a good book

For C++ -those published after 2011
For Java -those published after 2008

Assessment

Assignments (2- each with 2 parts)	20%	
Term test (1 hour)	20%	
Exam (3 hours)	60%	(C++ and Java)
Total	100%	

A total of 50% or more for the total mark will be a pass.

Assignments will be submitted electronically via STREAM

Aim to submit them before the day they are due!

Assignments

Assignments may be done in group-at most 2 **students-pair programming.**

Both students named in **the source file** and in **the output** of each assignment- **send only one file for marking**.

Each team member will receive the same grade.

The collaboration is limited only to members within each group.

It is a student responsibility to check their assignment marks and notify in writing any errors they might find no later than 10 days after the day the marks were made available.

Assignments

Program solutions that do not compile or do not run in our laboratories get 0 marks.

Late assignments - a penalty of **5%** per hour or fraction of hour it is late.

Make sure you read and understand each assignment requirements!

Each assignment will be discussed during **Wed Lectures** before the assignment is due. Sample solutions will be presented during **Lectures (Mon) - bring your solution and compare.**

Good advice!

Create and work on a project you design because you are interested in it and passionate about it!

B. Stroustrup (C++), Linus Torvalds (Linux)

Class representative

?

To do:

- Go to Library and find out what C++ and Java books are available (browse them, borrow some).
- Browse the 159.234 Stream

If you have any problem with 159.234 or need any help with it come and see me.

Enjoy your semester!