

Introduction to C++

Martin Robinson

Dec 2019

- Course Git repository at
https://github.com/martinjrobin/cpp_course_material
 - Contains lecture notes and exercises
- Combination of lectures and practical sessions
 - Practical exercises (practical*.pdf) give you practice on the material covered in the lectures

This training course covers the following topics:

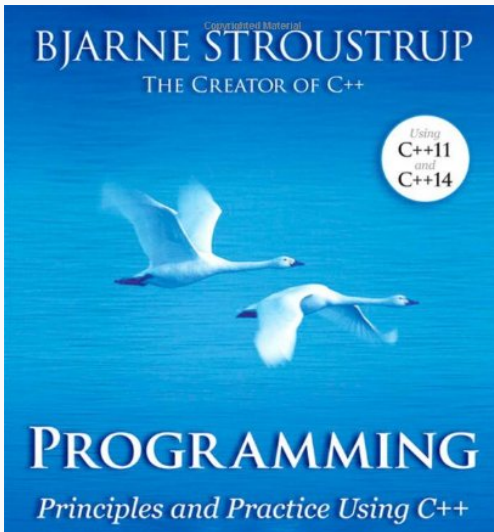
1. basic types, flow control, `std::array`, input/output
2. pointers, references, functions, templates, `std::vector`
3. classes and object-oriented programming

This course gives you a practical toolbox of C++ programming up to C++14. *This is a small part of C++ as a whole!*

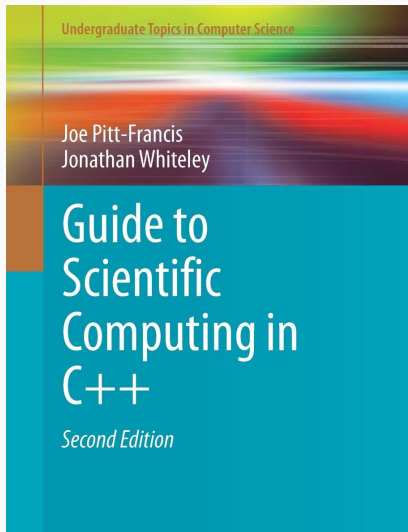
Tuesday to Friday:

- 09:30-11:00 Lecture & practical session
- 11:30-13:00 Lecture & practical session
- 13:00-14:00 Lunch
- 14:00-17:30 Practical session

- Programming: Principles and Practice Using C++



- Guide to Scientific Computing in C++



Software for the course

■ Compiler explorer

The screenshot shows the Compiler Explorer interface in a Mozilla Firefox browser. The address bar displays <https://gcc.godbolt.org>. The main interface is divided into several panels:

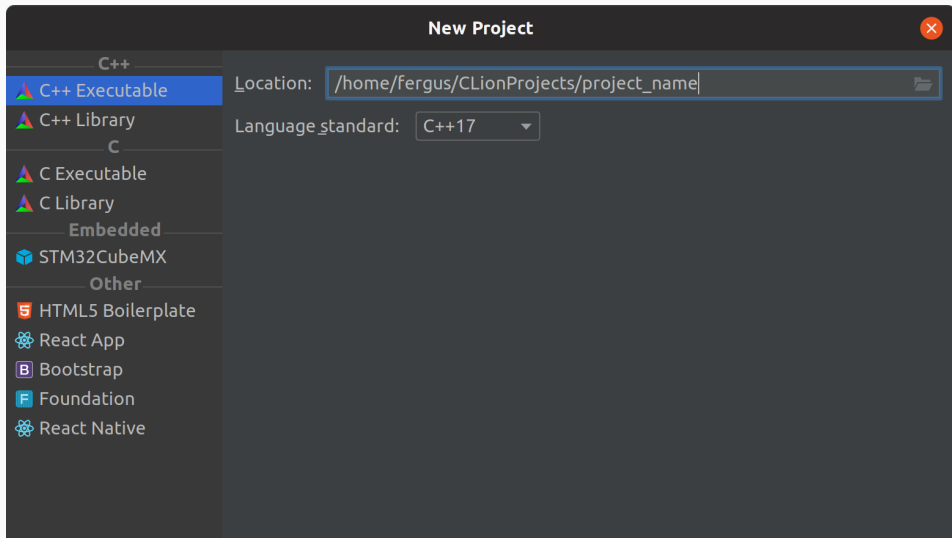
- Source Editor:** Contains a C++ source file named "C++ source #1". The code is:

```
1 #include <iostream>
2
3 int main() {
4     std::cout << "Hello, World!" << std::endl;
5     return 0;
6 }
```
- Compiler Selection:** The compiler is set to "x86-64 gcc (trunk)".
- Compiler Options:** A dropdown menu is open, showing various options with checkboxes: 11010, .a.out, .LX0:, lib.f, .text, //, \s+, Intel, and Demangle. The "Compiler options..." dropdown is also visible.
- Libraries:** A section for adding libraries, currently empty.
- Assembly View:** Shows the generated assembly code for the program:

```
1 .LC0:
2     .string "Hello, World!"
```
- Output:** A section showing the output of the program, which is "Hello, World!". It also displays the execution time as "3130ms (110537B)".

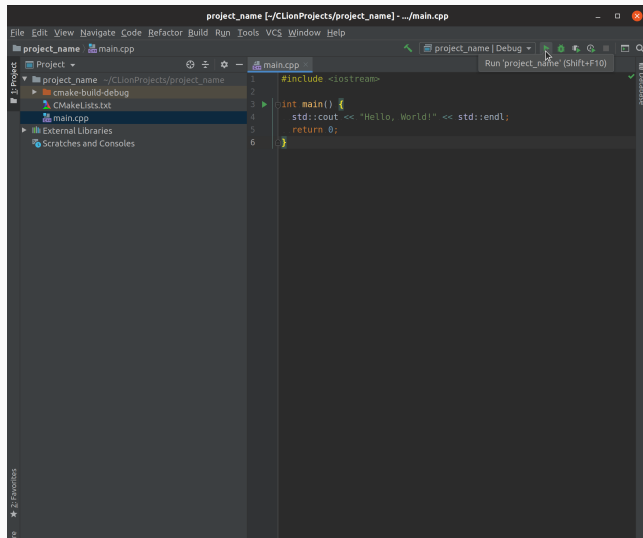
Software for the course

- CLion



Software for the course

- CLion



Acknowledgements

Material for this course adapted from:

- Pitt–Francis & Whiteley: Guide to Scientific Computing in C++
- C++ for Scientific Computing course by Joe Pitt–Francis:
<http://www.cs.ox.ac.uk/people/joe.pitt-francis/C++ScientificComputing/>