Computer Science

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Objectives of the module

Objectives

- learn C++ language
- learn Object Programmation Concept
- learn Optimized compilation chain

C++ introduction

Chronology

- first version 1983 by Bjarne Stroustrup
- first standardized version 1998
- last standardized version 2017

C++ introduction

What is C++?

- most used language for software dev
- object oriented language

C++ introduction

Advantages C++

- high perf (vs python)
- cross-plateform
- object representation : increase dev flow
- many object in standard lib

Comments

```
// this is a inline comment
CStash intStash; // you could comment like this
/* this is block comment
int i;
char* cp;
ifstream in;
*/
```

Standard type

integer

- char
- short
- int
- long

Each one could be unsigned or not.

Standard type

real

- float
- double
- long double

Each one could be unsigned or not.

Standard type

integer

Be carefull : exact size of type variables depend of the compiler manufacturer

variable definition

- definition
- affection and assignment

instruction

- all instruction finish with ;

operator

- maths
- logical

function

- Definition
- Call

function

- where place the definition?
- overloading a function

Our first binary

- code structure
- compilation : g++ -Wall -o labs1.o -c labs1.cpp
- linking : g++ -o labs1 labs1.o
- run binary ./labs1

Address and Value

- How to define a memory address of variable?
- How to change a value to a memory address?
- How to get the address of a variable?

How to allocate a vector

- Static case : can't change the size
- Dynamic Allocation
- Free memory

function (2)

- argument with reference
- argument with address
- const argument
- inline fonction

Conditionnal structure and loop

- if else
- switch case
- while
- do while
- for

Class

- member functions/methods
- member variables
- private
- protected
- public

Class

- constructors (Could be overloaded)
- destructor (Unique)
- inheritance
- operator overload

Link and document

- Google Guide Style : some great practices
  `https://google.github.io/styleguide/cppguide.html`
- C++ resources network : reference help :
  `http://www.cplusplus.com/`
- VIM : IDE for dev : `http://www.vim.org/`
- Emacs : IDE for dev :
  `https://www.gnu.org/software/emacs/`
- QT Creator : IDE for dev
  `http://doc.qt.io/qtcreator/index.html`

Books

- B. Stroustrup: Programming – Principles and Practice Using C++ (Second Edition)
- Bjarne Stroustrup: The C++ Programming Language (4th Edition)