

Computer Science

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① Computer Science : C++

C++ Language : introduction

Comments

Type

variable definition

instruction

fonction

Our first binary

Pointer and Dynamic Memory Allocation

Function (2)

Conditionnal structure and loop

Link



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-platform
- ▶ 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



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)