

# C++ Introduction

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# The C++ Programming Language

## ■ C++

- Object-Oriented
- Extended from C
- New standards: C++11, C++14

## ■ GNU compiler

- `$ g++ -std=c++11 -o hello main.cpp`
- `$ g++ -std=c++14 -o hello main.cpp`

# IDE & Tutorials

## ■ Online IDEs for C++

- Tutorialspoint Online IDEs ([www.tutorialspoint.com/codingground.htm](http://www.tutorialspoint.com/codingground.htm))
- Goorm.io ([www.goorm.io](http://www.goorm.io))
  - Create a C/C++ container

## ■ C++ tutorials

- Cplusplus.com ([www.cplusplus.com/doc/tutorial/](http://www.cplusplus.com/doc/tutorial/))
- LearnCpp.com ([www.learncpp.com/](http://www.learncpp.com/))
- Tutorialspoint ([www.tutorialspoint.com/cplusplus/](http://www.tutorialspoint.com/cplusplus/))
- C++ youtube video
  - ([www.youtube.com/watch?v=Rub-JsjMhWY](http://www.youtube.com/watch?v=Rub-JsjMhWY))

# Hello C++

```
// First c++ app in this class
#include <iostream>

int main() {
    std::cout << "Hello, C++ Intro!\n";

    return 0;
}
```

```
// single line comment
```

```
/* multiple-line comments
   second line comment
*/
```

# Hello C++

```
// First c++ app in this class
#include <iostream>
using namespace std

int main() {
    cout << "Hello, C++ Intro!" << endl;

    return 0;
}
```

“**using namespace xxx**” sets default namespace to look for

# Console I/O

## ■ Output

- `cout << "test" << " my skill\n";`

## ■ Input

- `cin >> n;`

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

int main() {
    int n;

    cin >> n;
    cout << "n = " << n << endl;
}
```

# String input

## ■ String type

- string s;

## ■ getline(cin, s)

- input a line of string

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

int main() {
    string s;
    cin >> s;
    cout << "s = " << s << endl;
}
```

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

int main() {
    string s;
    getline (cin, s);
    cout << "s = " << s << endl;
}
```

# String Stream

- Convert string into stream

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

int main() {
    string str = "one two three";
    stringstream ss(str);

    string tok;
    while (ss >> tok)
        cout << tok << endl;
}
```



# I/O Redirection

## ■ Redirect `stdout` to a file

- `$ ./hello > list_out`
  - Create if not present, otherwise overwrite it
- `$ ./hello >> list_out`
  - Create if not present, otherwise append to it

## ■ Redirect `stdin` from a file

- `$ ./hello < list_input`
  - Accept input from a file

# [Lab – Practice #1]

- **Split a string line into words**
  - Input: string of words separated by space
  - Output:
    - Original input string
    - One word per line, all character in upper case

```
$ cat input
Test my skill

$ ./ssplit < input
input: Test my skill
TEST
MY
SKILL
```

# [Lab – Practice #2]

## ■ Print out $n$ prime numbers

- Input :  $n$  ( $1 \leq n \leq 100$ )
  - Check input value. If not the right range, ask again.
- Output :  $n$  prime numbers

```
$ ./nprimes
How many [1..100]? 5
2
3
5
7
11
Total 5 primes found!
```