

# Practice 1

Seoul National University  
Graphics & Media Lab

# Goal of this class

- Learn Objected-Oriented Programming
  - Object-Oriented Programming
  - in C++
- **Use C++ like Korean.**

# Class Introduction

## Schedule

- 10+ short program assignments (at each class)
- 1 large program (as term project)

## Reference

- <http://graphics.snu.ac.kr> (temporary)
- ETL
- Google
  - But don't copy code for assignment

# Assignment Submission

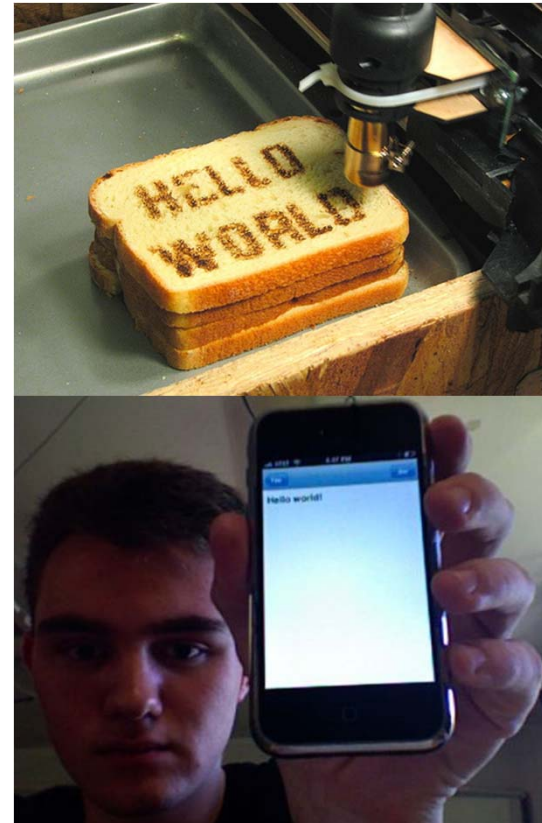
- Send E-mail
  - To [pmta@graphics.snu.ac.kr](mailto:pmta@graphics.snu.ac.kr)
  - Mail Title :
    - Practice\_Week01\_Assignment
  - Mail Contents
    - Student ID + Name
  - Attachment
    - One Source code file
    - Write a comment about your student ID and name on the top of the attached file

Until Friday  
11:59 PM

# Hello World!

- A "Hello world" program is a computer program that prints out "Hello world" on a display device.
  - It is typically one of the simplest programs possible in most programming languages.
  - By tradition, it is often the first program taught in a beginning class on a particular language.
  - It is also used to illustrate the most basic syntax of a programming language.

*- From Wikipedia*



# Hello world!

**C** #include <stdio.h>

```
int main(void)
{
    printf("Hello world\n");
    return 0;
}
```

**C++** #include <iostream>

```
int main()
{
    std::cout << "Hello World!" << std::endl;
    return 0;
}
```

**PHP**

```
echo "Hello World!";
?>
```

**Java**

```
class HelloWorld {
    public static void main(String[] args) {
        System.out.println("Hello world!");
    }
}
```

**Visual Basic .NET**

```
Sub main()
    Console.WriteLine("Hello, world!")
    Console.ReadKey()
End Sub
End Module
```

**Action Script 3.0**

```
import flash.text.TextField;
import flash.display.Sprite;

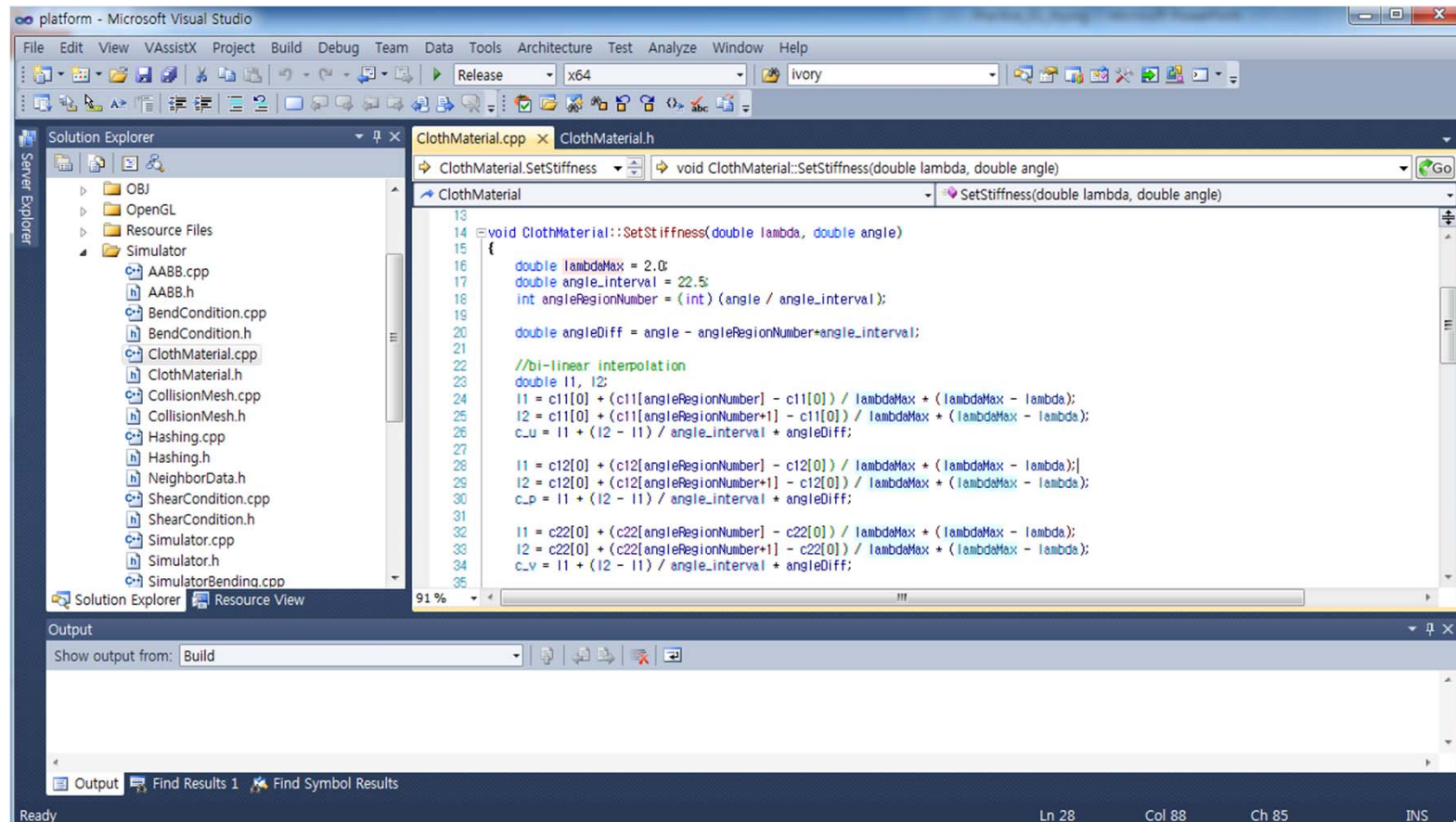
public class Greeter extends Sprite
{
    public function Greeter()
    {
        var txtHello:TextField = new TextField();
        txtHello.text = "Hello World";
        addChild(txtHello);
    }
}
```

# Hello world!

- Use IDE, Compile, Link, Execute.

# Programming Environment

- IDE : Integrated development environment
- Xcode, Eclipse, C++ Builder, etc ...
- We will use “Visual Studio 2010”

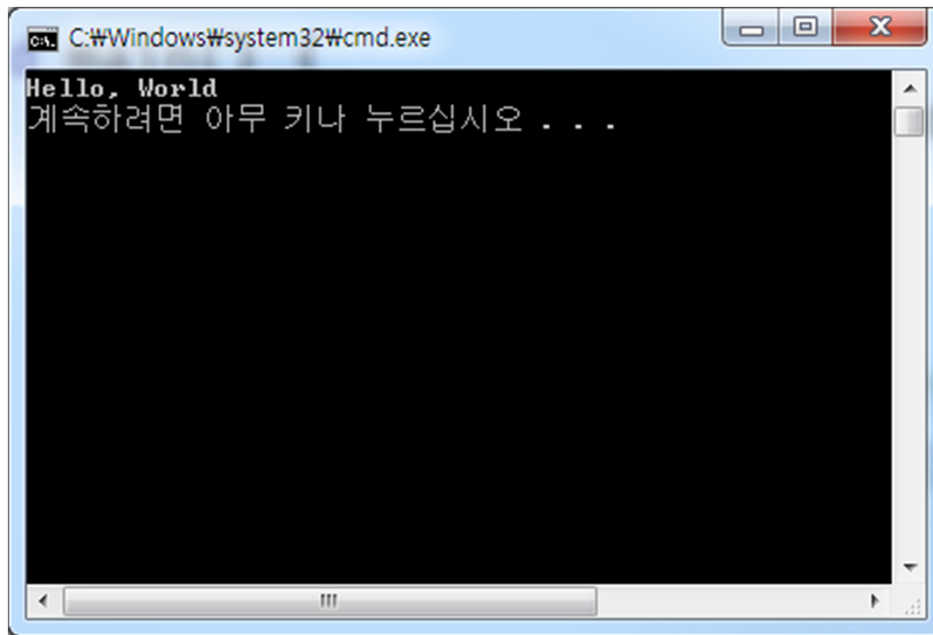




# Hello World!

```
#include <iostream>
```

```
void main() {  
    std::cout << "Hello, World" << std::endl;  
}
```



# Assignment

- Brief review quickly ...

# Types, Variables

- Primitive built-in types
  - void
  - bool, char, w\_char, short, int, long, float, double
  - unsigned char, unsigned int, ...

```
#include <iostream>
```

```
void main() {  
    int height = 11, width = 9, length = 40;  
    int result = height * width * length;  
  
    float pi = 3.141592f;  
}
```

# Basic Expressions

- Arithmetic expressions

$+$ ,  $-$ ,  $*$ ,  $/$ ,  $\%$

- Numerical predicates

$==$ ,  $!=$ ,  $>$ ,  $<$ ,  $>=$ ,  $<=$

# Basic Expressions

- Conditional operator  
cond ? expr1 : expr2;

```
#include <iostream>
```

```
void main() {  
    std::cout << ((3 < 4) ? 3 : 4);  
}
```

# Basic Statements

- Conditional statement
  - **if ... else**, switch

```
#include <iostream>
```

```
void main() {  
    const int v = 5;  
  
    if(v < 3)          std::cout << "v is less than 3";  
    else if(v < 5)     std::cout << "v is less than 5";  
    else if(v < 7)     std::cout << "v is less than 7";  
    else               std::cout << "v is larger than 7";  
}
```

# Basic Statements

- Conditional statement
  - if ... else, **switch**

```
#include <iostream>
```

```
void main() {  
    const int v = 5;
```

```
    switch(v) {  
        case 3:      std::cout << "v is 3"; break;  
        case 5:      std::cout << "v is 5"; break;  
        case 7:      std::cout << "v is 7"; break;  
        default :    std::cout << "v is not 3 or 5 or 7"  
    }  
}
```

# Basic Statements

- Loops
  - **for**, while
- Problem
  - Do summation from 1 to 10

```
#include <iostream>
```

```
void main() {  
    int sum = 0;  
    for(int i=1; i<=10; ++i)  
        sum += i;  
    std::cout << sum;  
}
```



# Basic Statements

- Loops
  - for, **while**
- Problem
  - Do summation from 1 to 10

```
#include <iostream>
```

```
void main() {  
    int sum = 0, i = 1;  
    while(i <= 10) {  
        sum += i;  
        i++;  
    }  
    std::cout << sum;  
}
```

# Function

- How to define a simple function ?

```
#include <iostream>

void main() {
    const int height = 3, width = 5, length = 7;
    std::cout << " Volume is " << height*width*length;
}
```



```
#include <iostream>

int volume(int h, int w, int l) { return h*w*l; }

void main() {
    const int height = 3, width = 5, length = 7;
    std::cout << " Volume is " << volume(height, width, length);
}
```

# Assignment - Factorial

- Write a function `int factorial(int N)`
- Code two versions of factorial function:
  - 1) using repetition
  - 2) using recursive function
- Output
  - `factorial(5)` : return 120
  - `factorial(1)` : return 1