

C Programming

Lecture 3 : C Introduction

C Programming Language

- Designed by Dennis Ritchie (1972)
 - used for developing UNIX OS
- C features
 - Structured programming , modular programming
 - Highly portable
 - Efficient (fast)
 - C has the features of high level language and low level language



Dennis Ritchie

simple C program (hello.c)

```
7 #include <stdio.h>
8
9 int main()
10 {
11     puts("Hello, World !");
12     return 0;
13 }
```

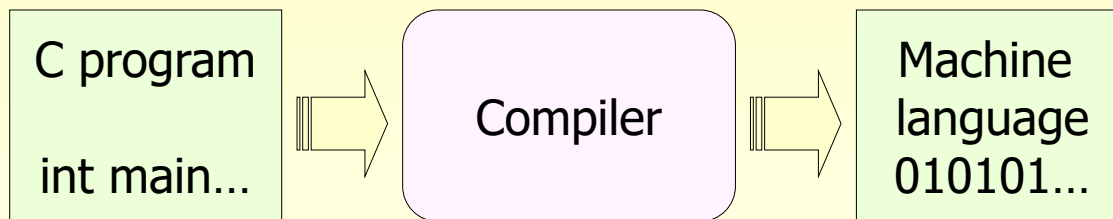
output:

Hello, World !

C compiler

■ compiler?

- Programmer can use high level language such as C
- CPU knows machine language (assembly language)

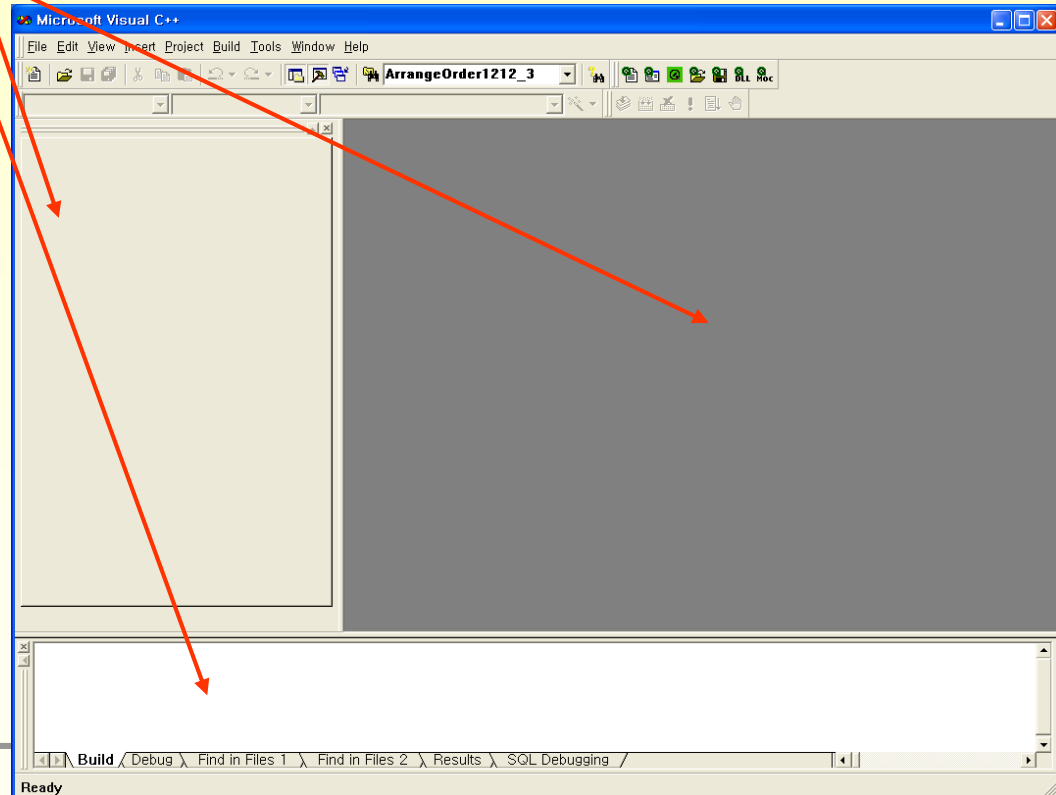


■ C compiler

- Commercial compiler: Microsoft Visual C/C++ (ver. 6.0)
- Free compiler: gcc

Visual Studio 6.0

- Microsoft Visual C++ 6.0
 - Project window
 - Editing window
 - Message window

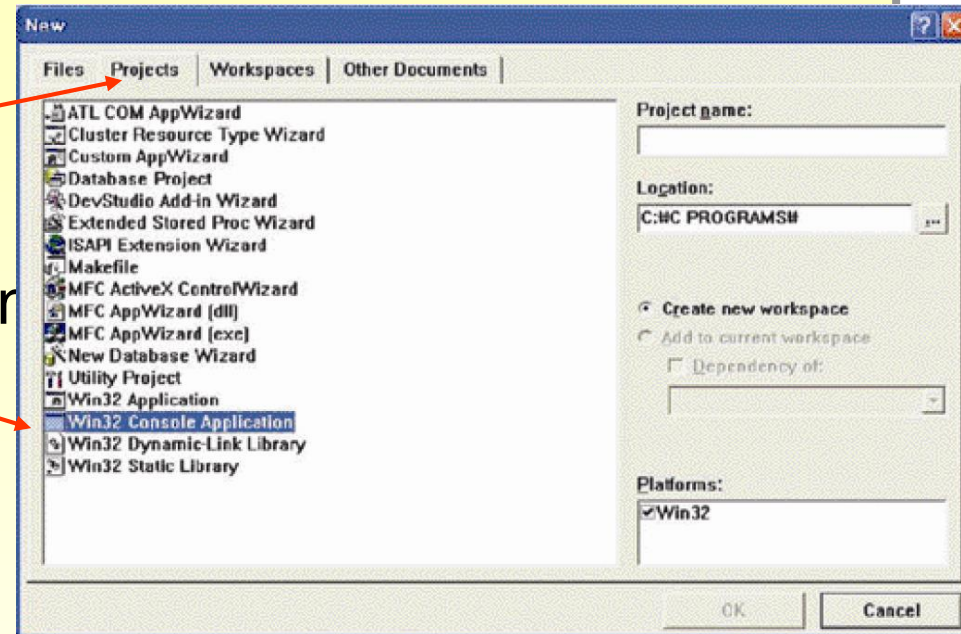


Program Development

1. Creating Project
2. Adding Files
3. Editing Program
4. Compile&Build
5. Execution&Debugging

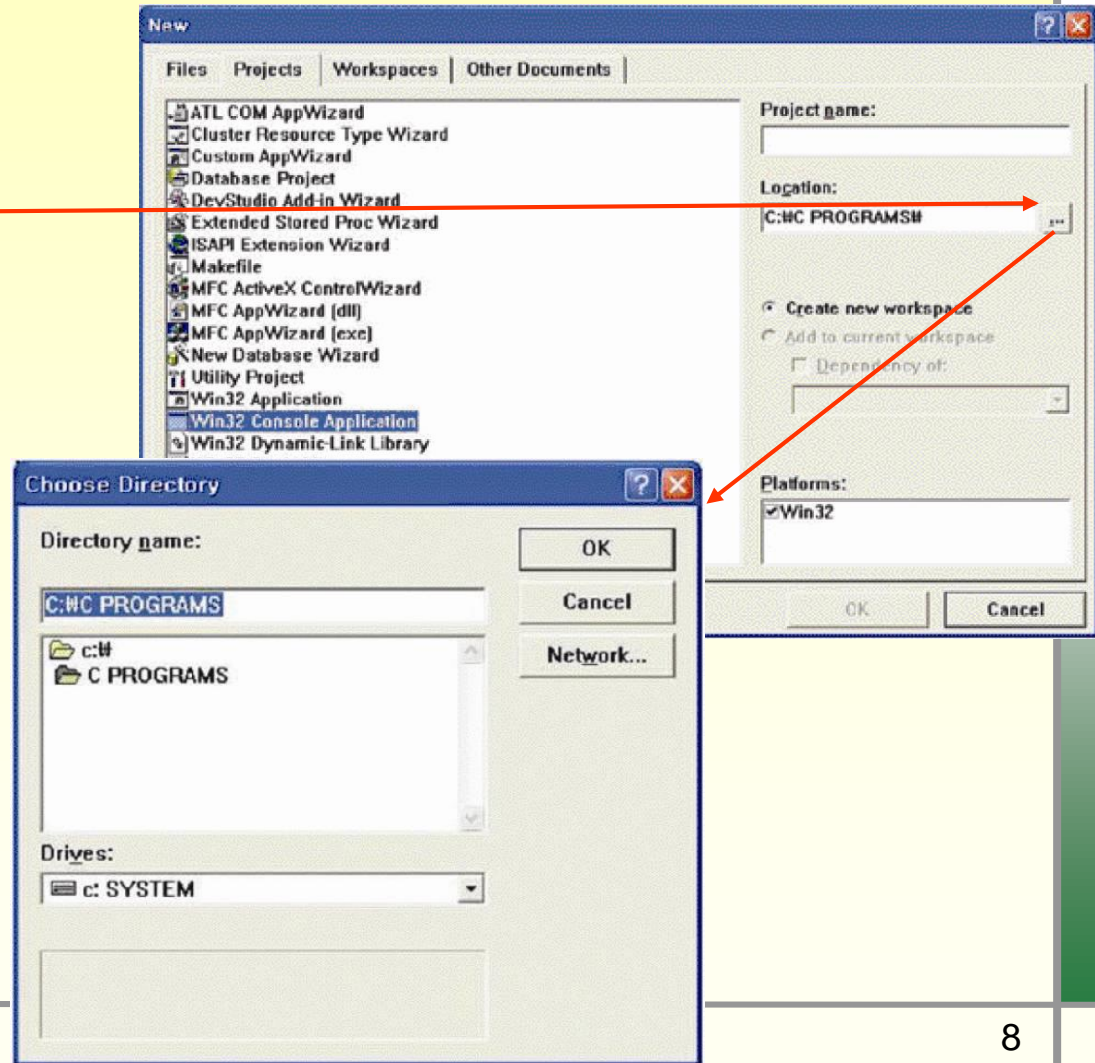
Creating a Project (1/5)

1. File → New
Projects tab
Win32 Console Application
2. Location
3. Project Name
4. OK
5. Finish & OK



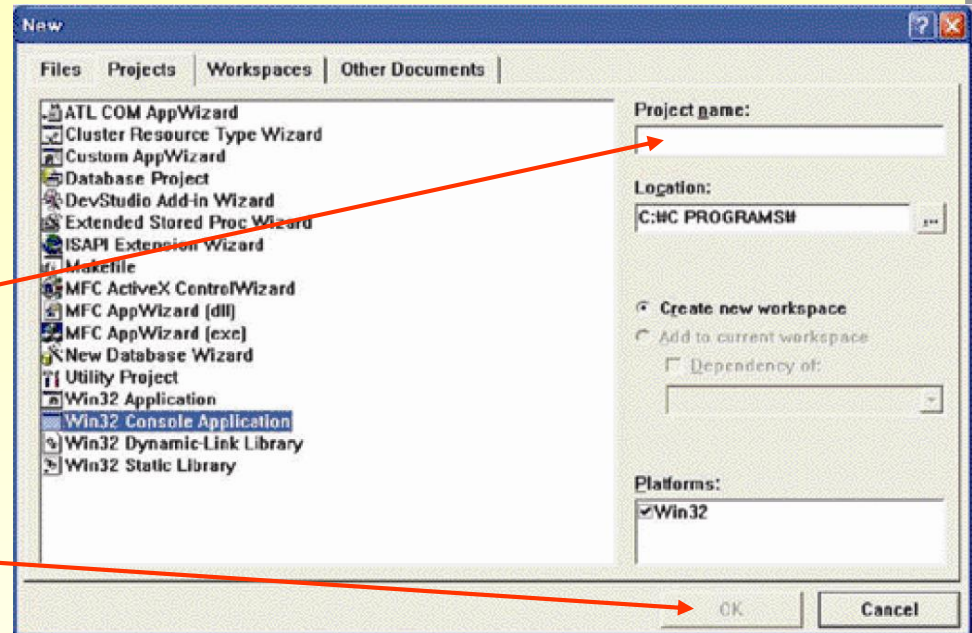
Creating a Project (2/5)

1. File → New
2. Location
Folder selection
3. Project Name
4. OK
5. Finish & OK



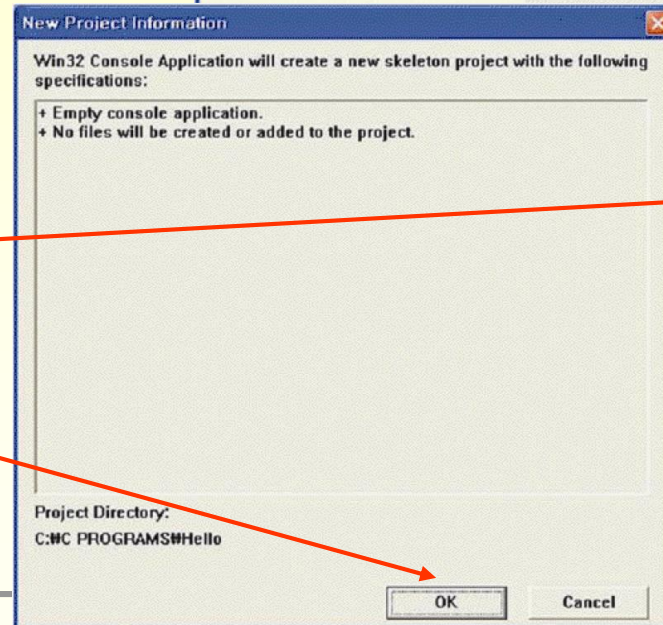
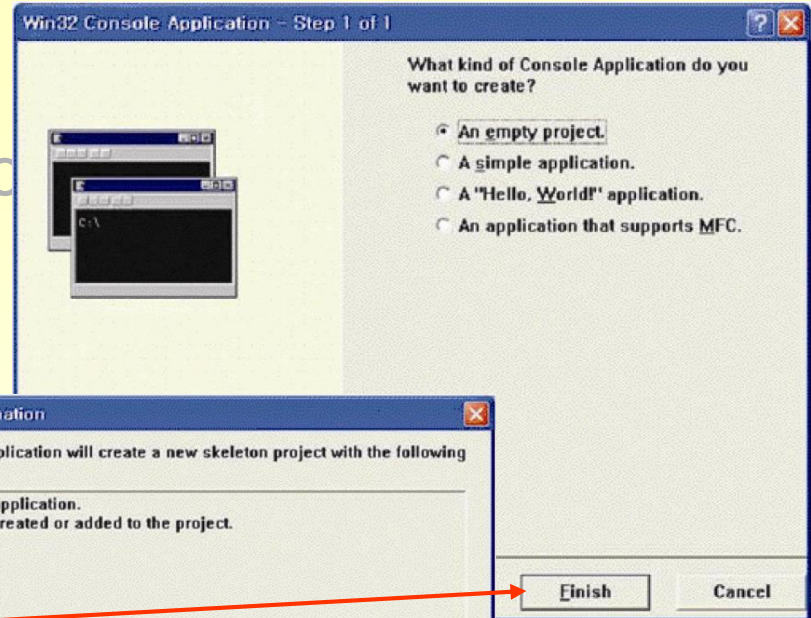
Creating a Project (3/5)

1. File → New
2. Location
3. Project Name
Hello
4. OK
5. Finish & OK



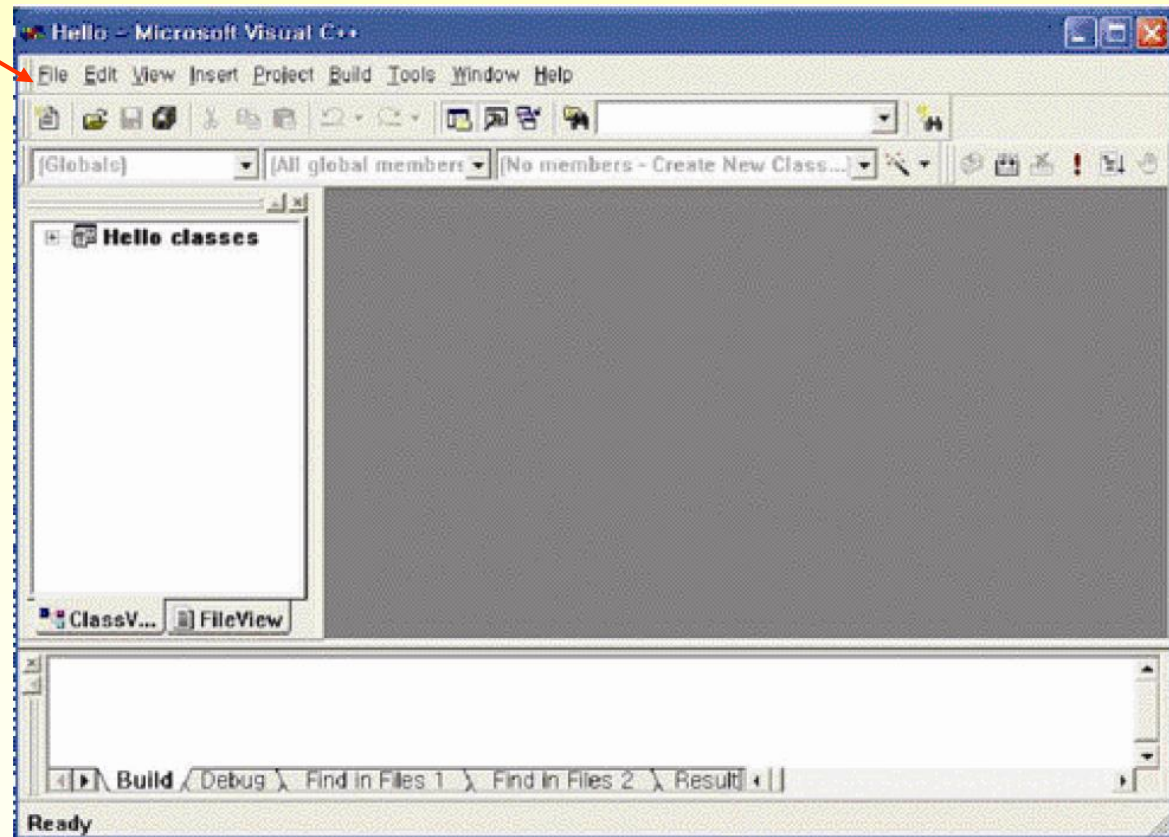
Creating a Project (4/5)

1. File → New
Win32 Console Application
2. Location
3. Project Name
4. OK
5. Finish
& OK



Creating a Project (5/5)

- Hello project is created



Adding Files (1/3)

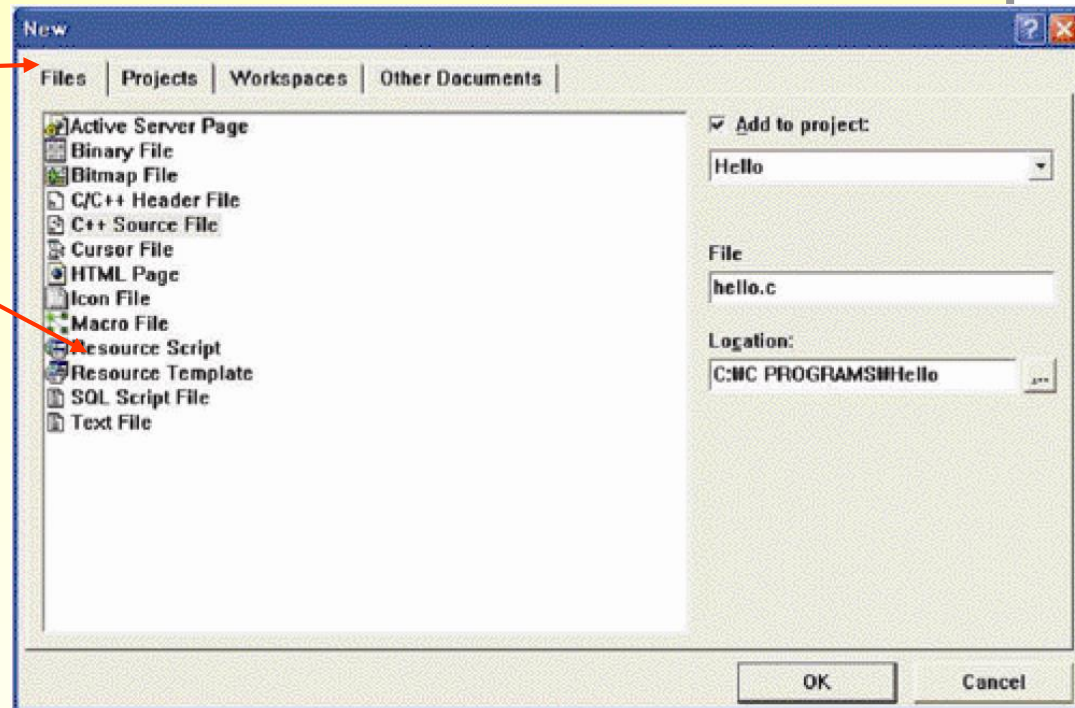
1. File → New

Files tab

C++ Source File

2. filename

3. OK



Adding Files (2/3)

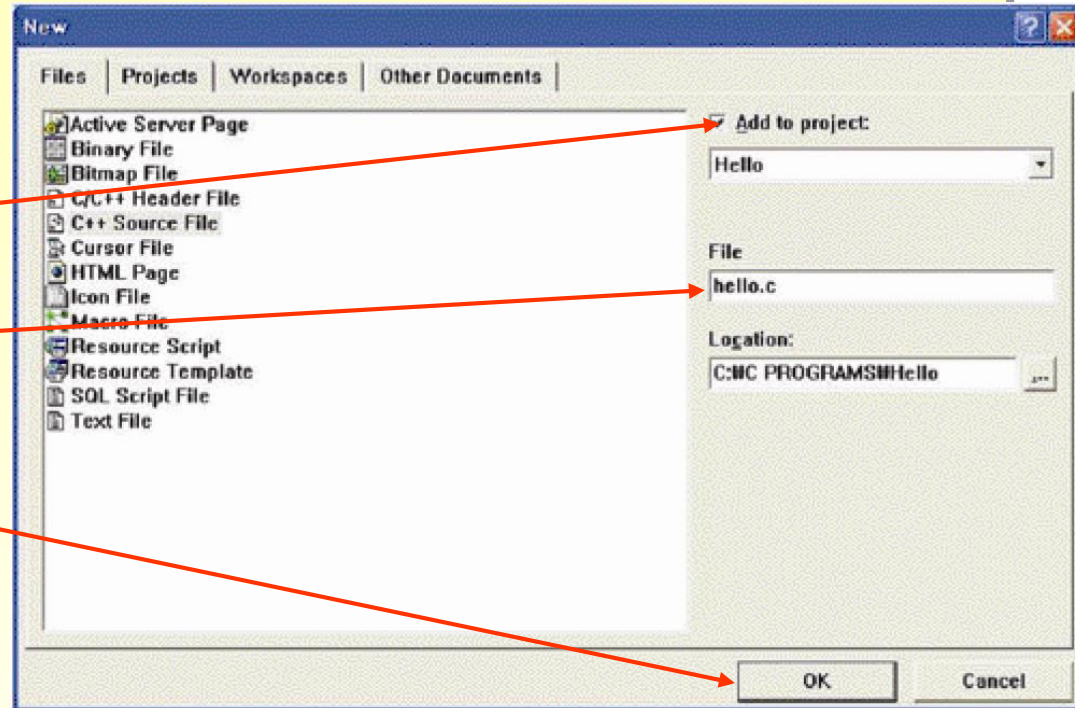
1. File → New

2. filename

Add to project

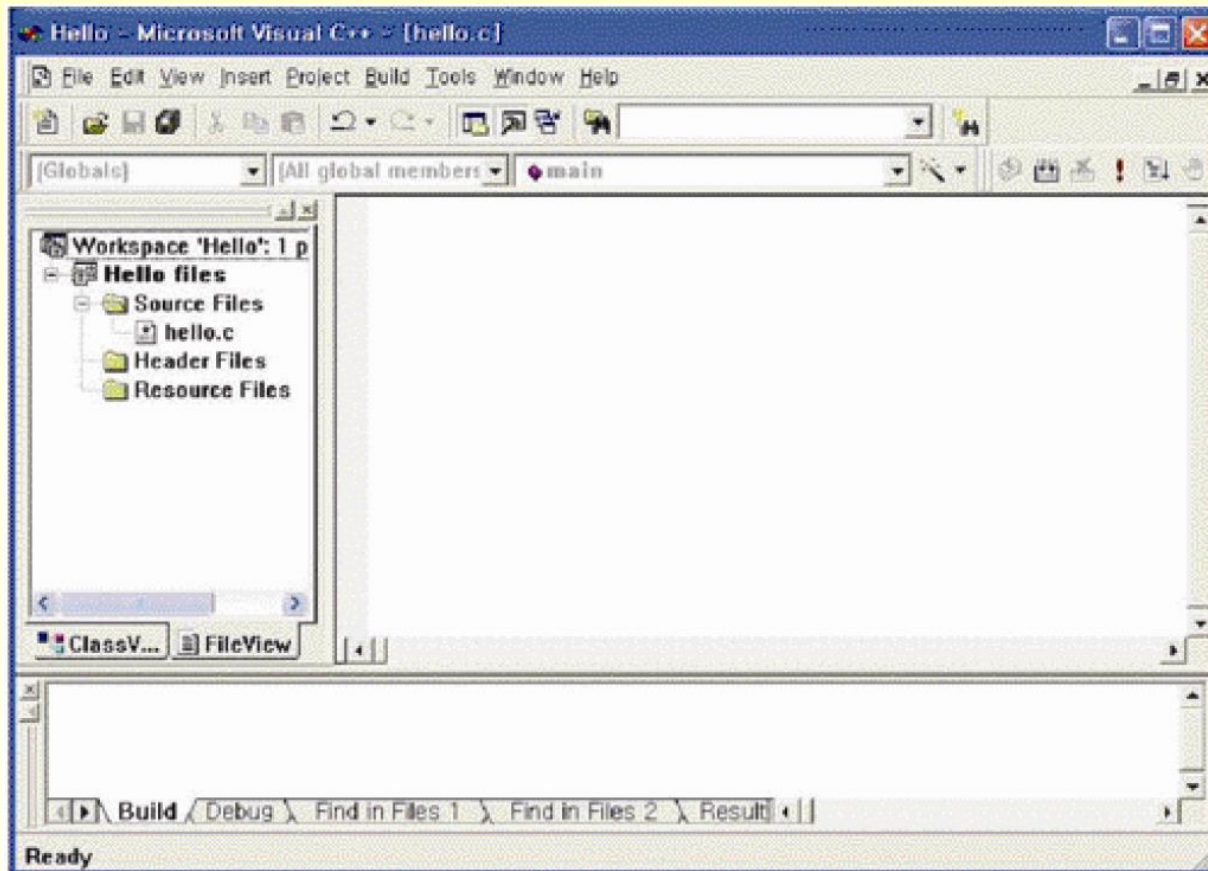
hello.c

3. OK

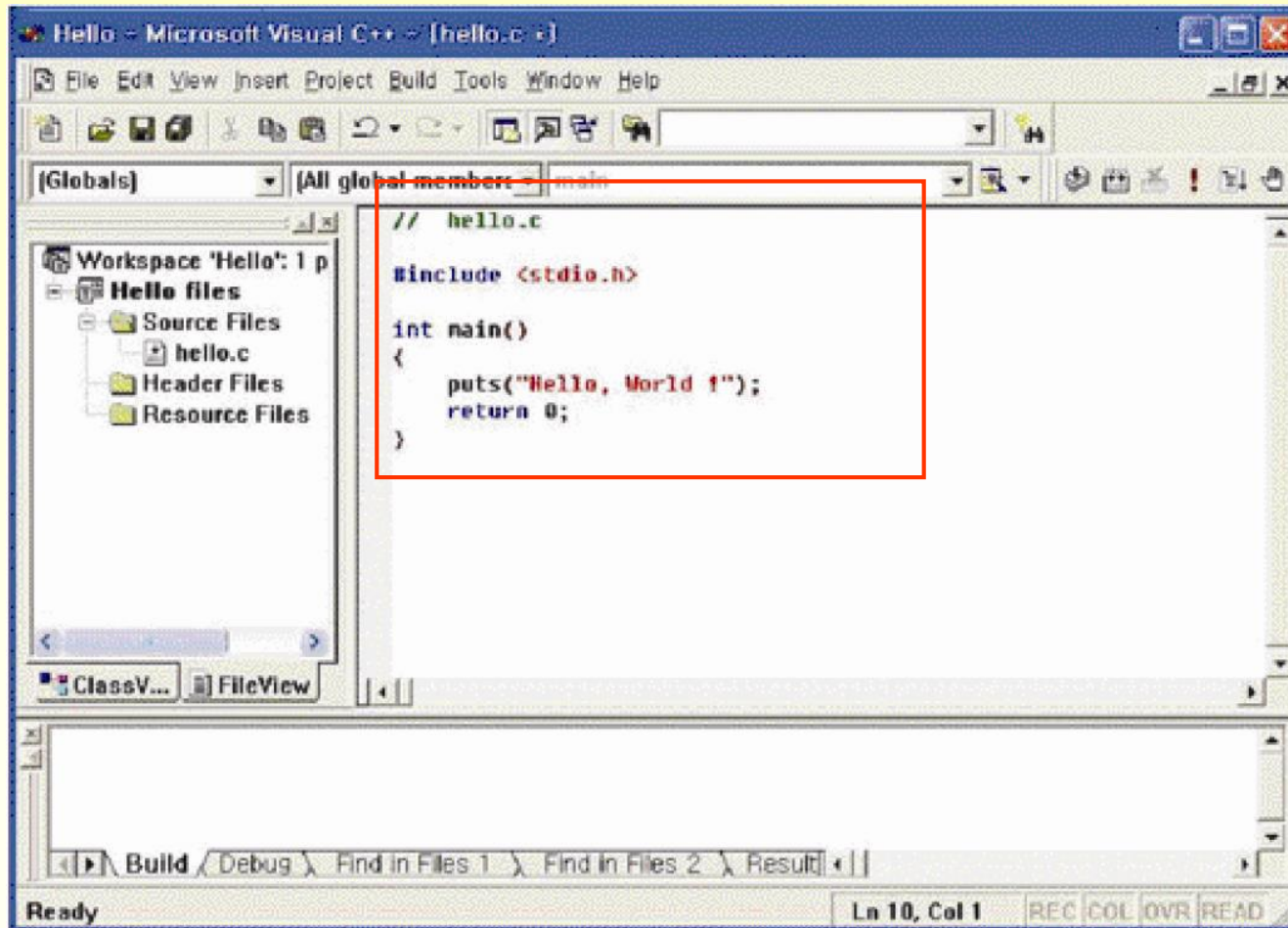


Adding Files (3/3)

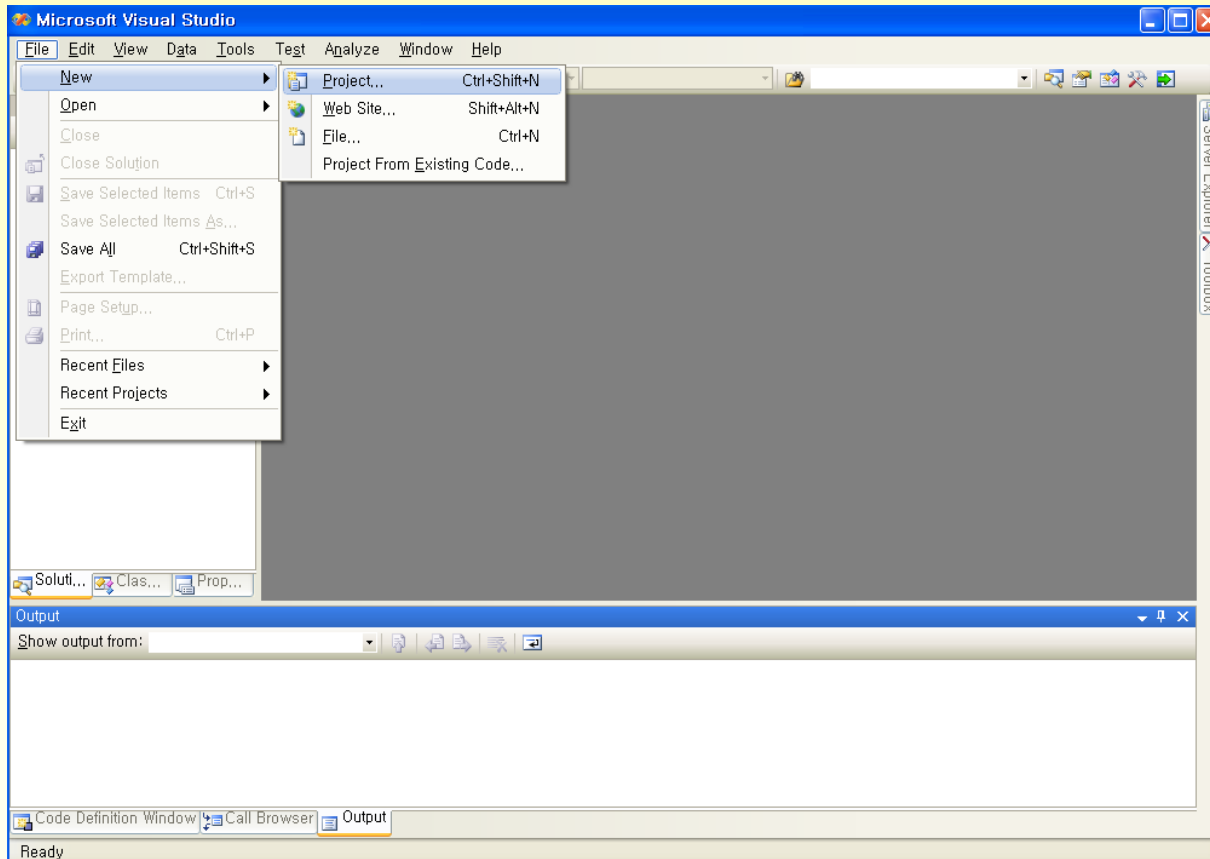
- Source file hello.c is added to Hello project



File Edit

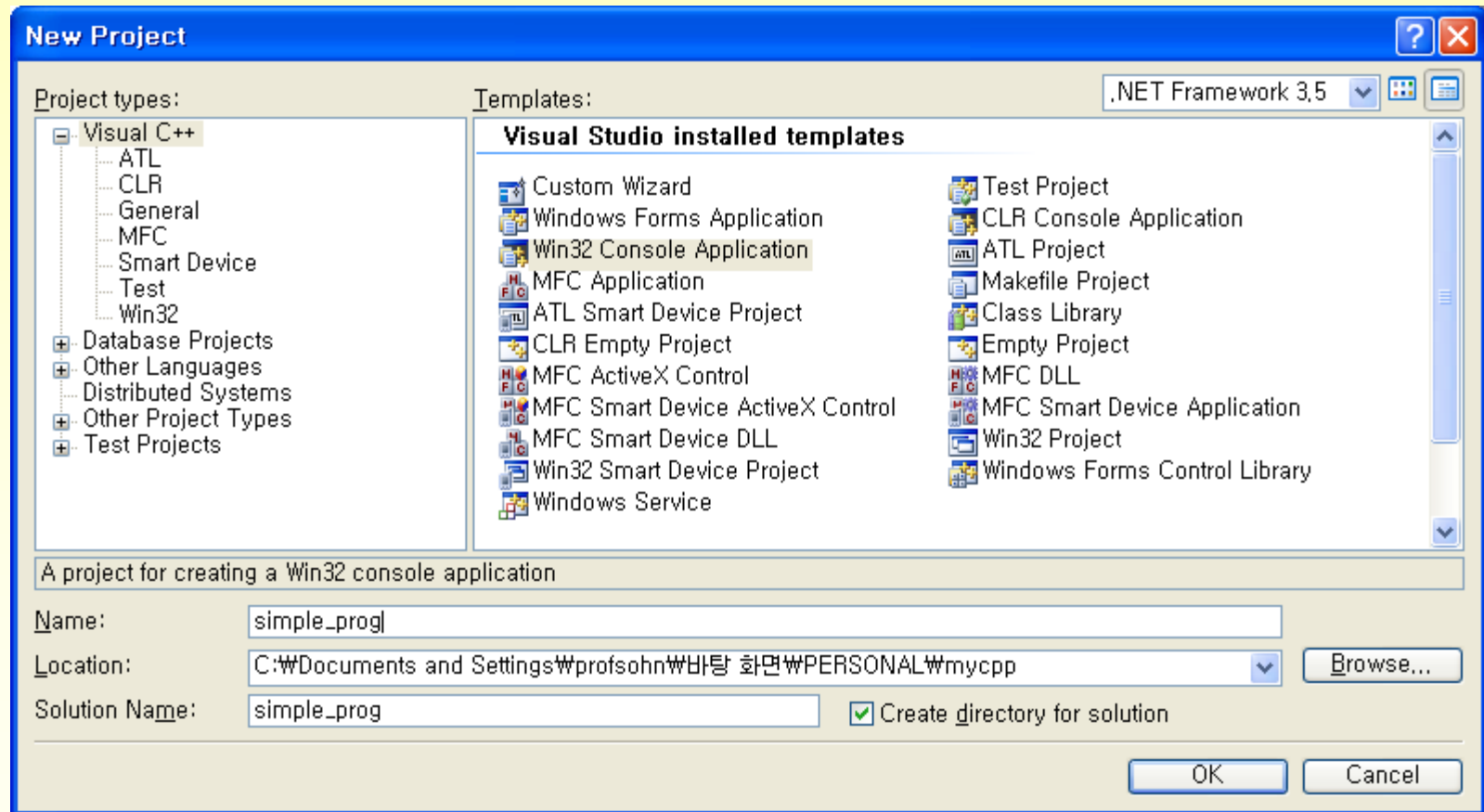


Visual Studio 2008 : Creating Command-Line Program



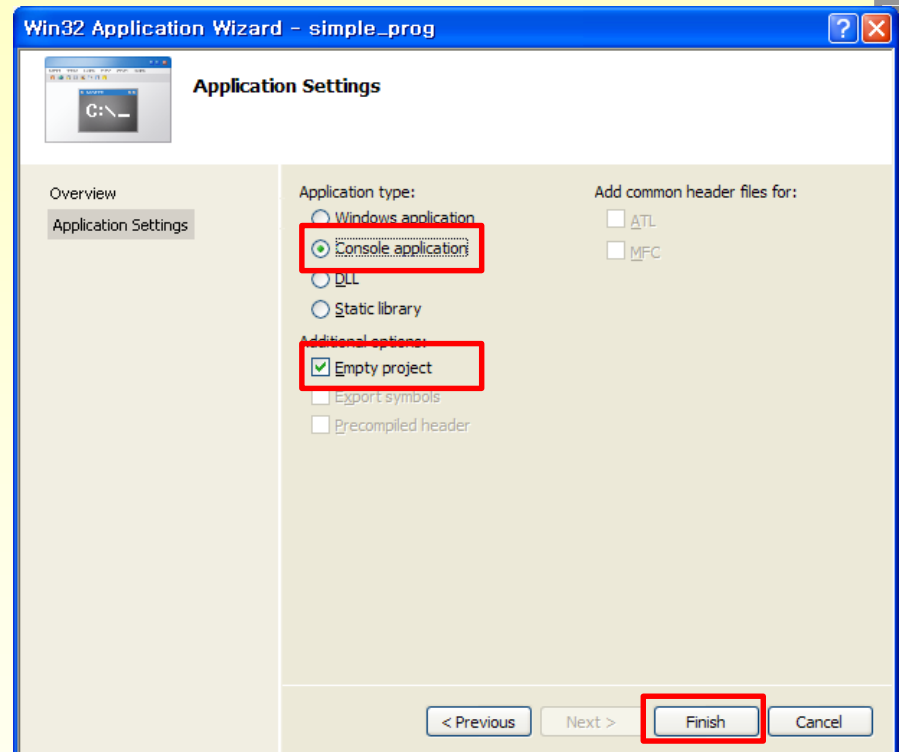
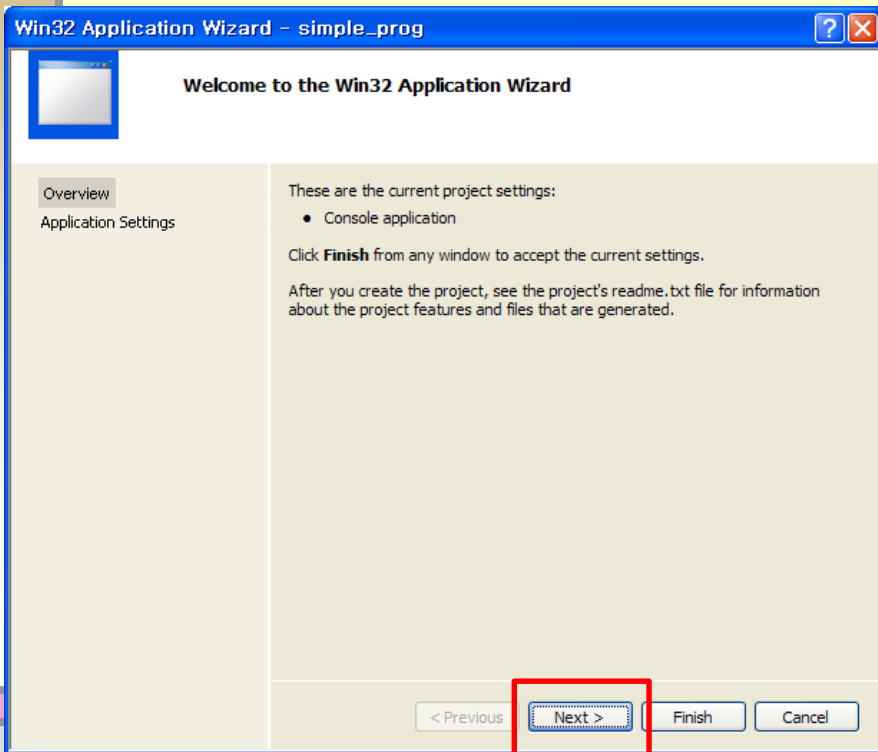
Visual Studio 2008

Creating Command-Line Program



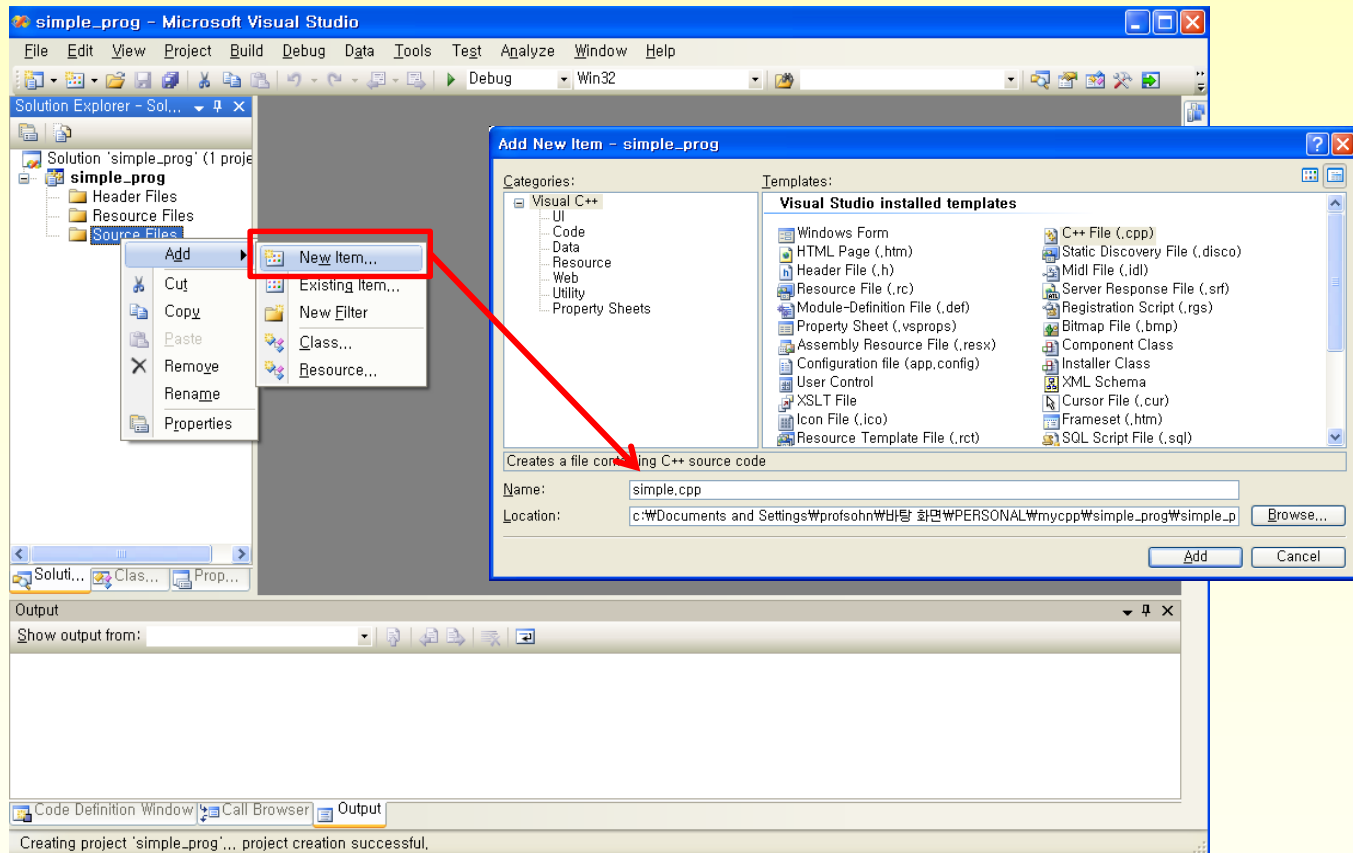
Visual Studio 2008

Creating Command-Line Program



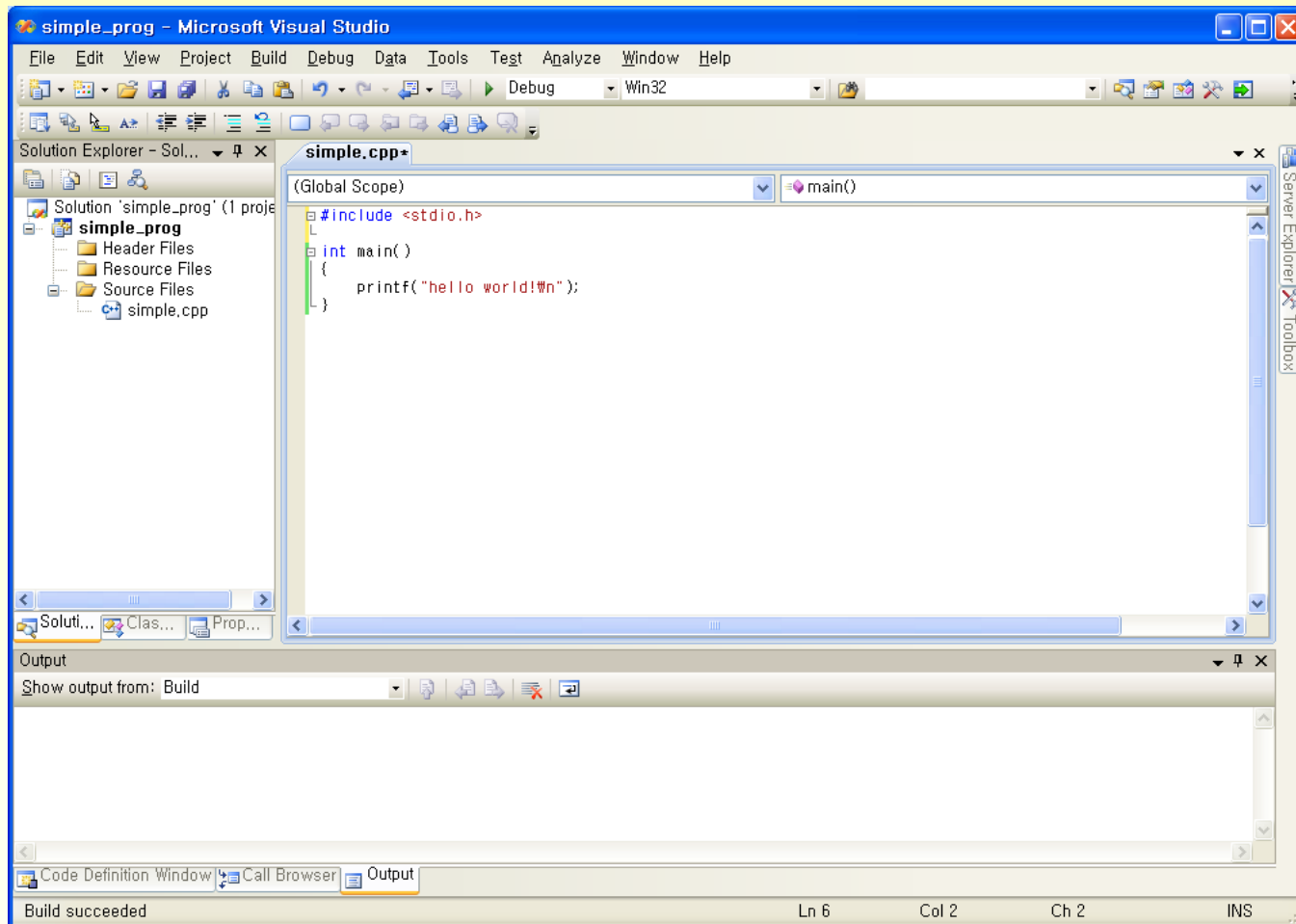
Visual Studio 2008

Creating Command-Line Program



Visual Studio 2008

Creating Command-Line Program



Compile & Build

- compile → Compile hello.c

```
-----Configuration: Hello - Win32 Debug-----  
Compiling...  
hello.c  
  
hello.obj - 0 error(s), 0 warning(s)
```

- Object file (.obj) is created

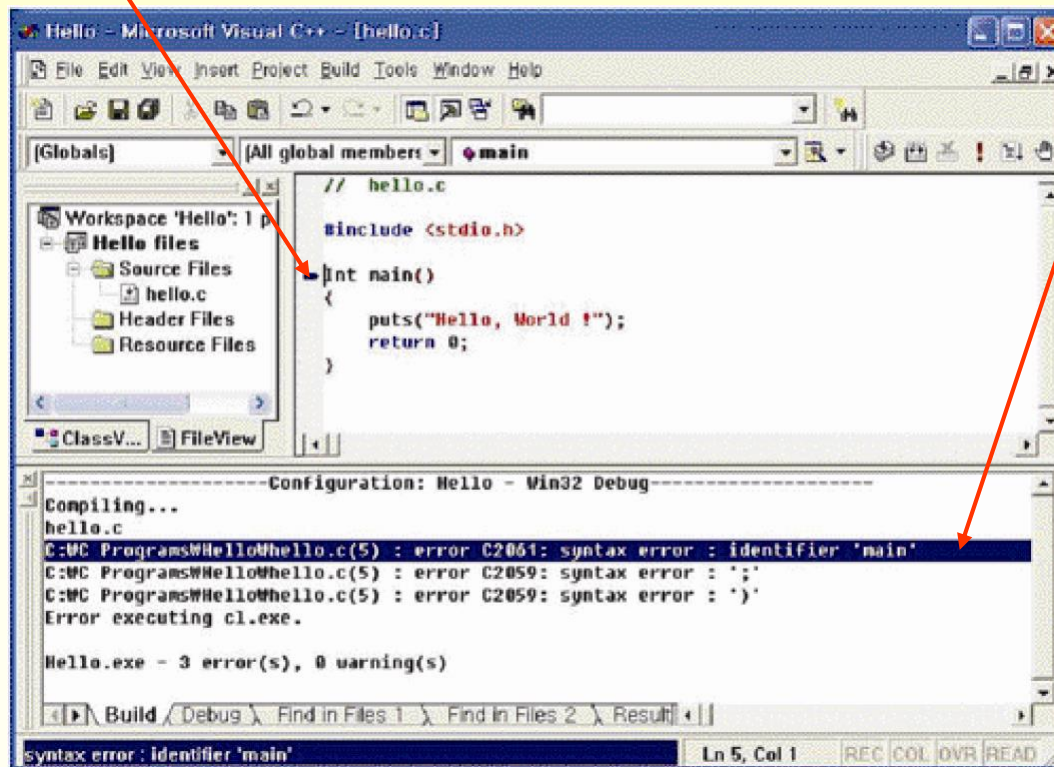
- Build → Build Hello.exe

```
-----Configuration: Hello - Win32 Debug-----  
Linking...  
  
Hello.exe - 0 error(s), 0 warning(s)
```

- Link : link object files and create a executable file (.exe)

Compile-time error

- Grammar error. Object file can not be created
- Double click error message line



The screenshot shows the Microsoft Visual C++ IDE. The main editor window displays the source code for 'hello.c':

```
// hello.c
#include <stdio.h>

int main()
{
    puts("Hello, World !");
    return 0;
}
```

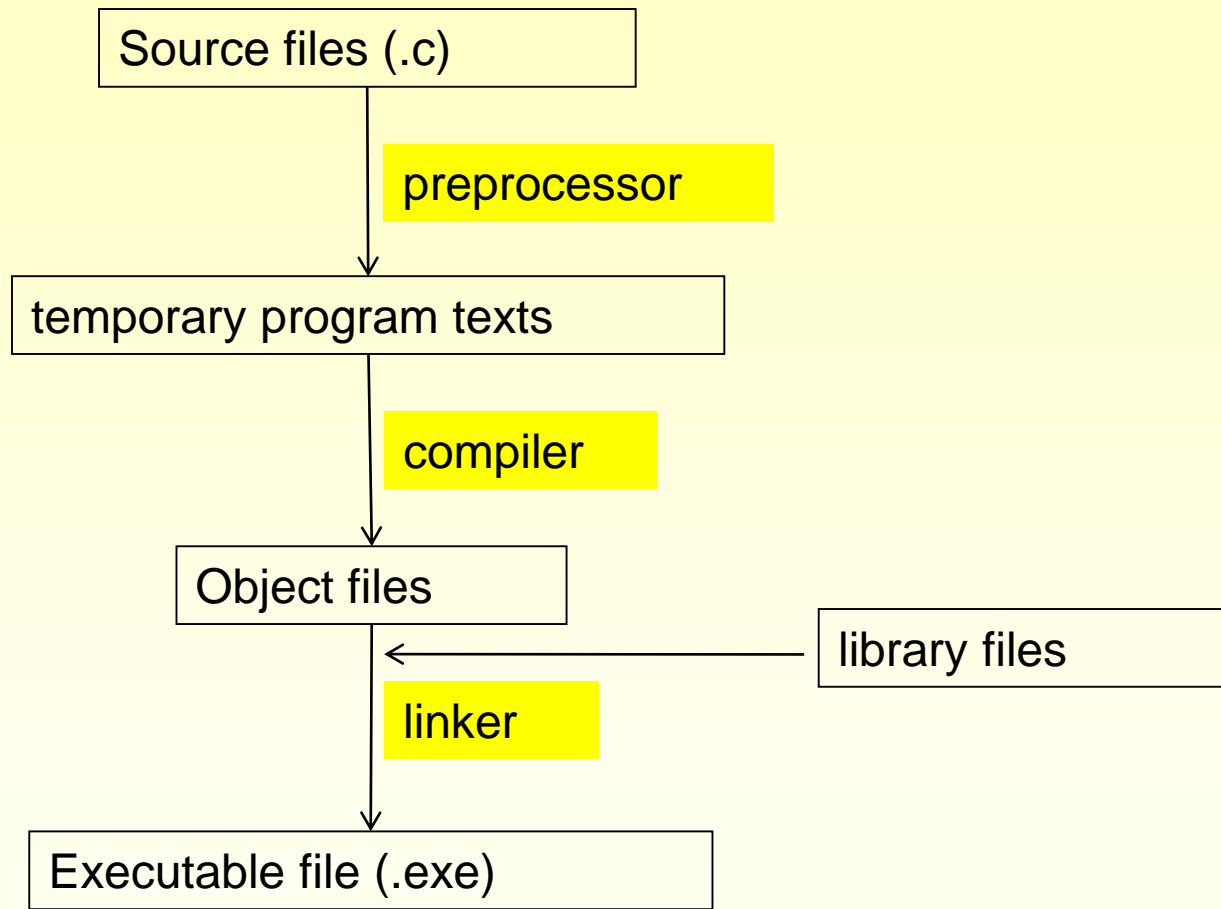
The left sidebar shows the 'Workspace 'Hello': 1' with a tree view containing 'Hello files', 'Source Files', 'hello.c', 'Header Files', and 'Resource Files'. The bottom console window shows the output of the compilation:

```
-----Configuration: Hello - Win32 Debug-----
Compiling...
hello.c
C:\WC Programs\Hello\hello.c(5) : error C2061: syntax error : identifier 'main'
C:\WC Programs\Hello\hello.c(5) : error C2059: syntax error : ';'
C:\WC Programs\Hello\hello.c(5) : error C2059: syntax error : ')'
Error executing cl.exe.

Hello.exe - 3 error(s), 0 warning(s)
```

Two red arrows point from the text in the list above to the IDE. One arrow points to the 'main' function definition in the source code, and the other points to the first error message line in the console output.

Programming Process



gcc / g++

- Free C/C++ compiler developed by GNU