C Programming & Lab

2. How to write a program

Sejong University

Outline

1) Write a program in Visual Studio

2) printf()

3) scanf()

4) Debugging

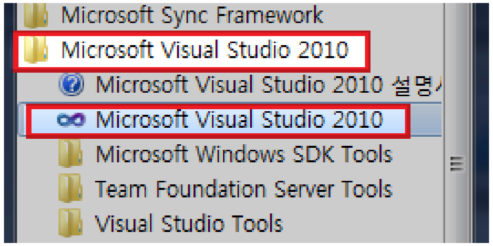
Introduction: Visual Studio

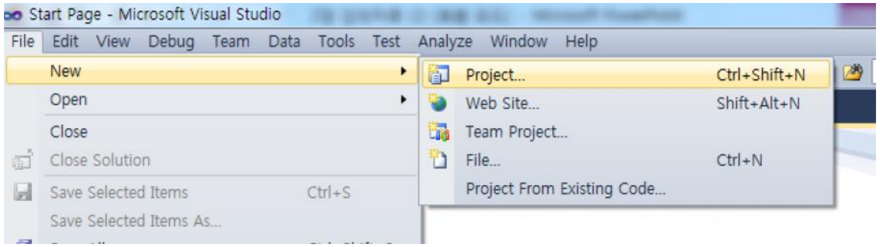
- Visual Studio provides a development environment for various programming languages
- In this course, we use ‘Visual C++’ (C compiler)
- Various versions of Visual Studio

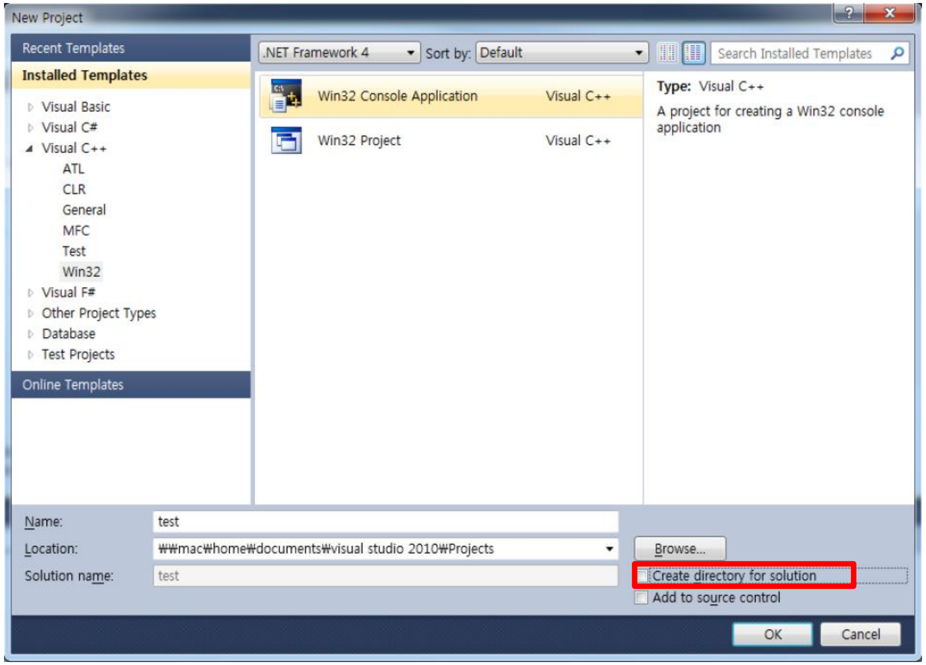
Visual Studio 2010	Visual Studio Express 2010
Visual Studio 2012	Visual Studio Express 2012
Visual Studio 2013	Visual Studio Express 2013
Visual Studio Professional 2015	Visual Studio Community 2015
Visual Studio Enterprise 2015	

Create a Project-1

- Start Visual Studio
- Create a new project


Microsoft Sync Framework
Microsoft Visual Studio 2010
Microsoft Visual Studio 2010 설명서
Microsoft Visual Studio 2010
Microsoft Windows SDK Tools
Team Foundation Server Tools
Visual Studio Tools


Start Page - Microsoft Visual Studio
File Edit View Debug Team Data Tools Test Analyze Window Help
New
Open
Close
Close Solution
Save Selected Items Ctrl+S
Save Selected Items As...
Project... Ctrl+Shift+N
Web Site... Shift+Alt+N
Team Project...
File... Ctrl+N
Project From Existing Code...



Type: Visual C++

A project for creating a Win32 console application

Name: test

Location: ₩₩mac₩home₩documents₩visual studio 2010₩Projects

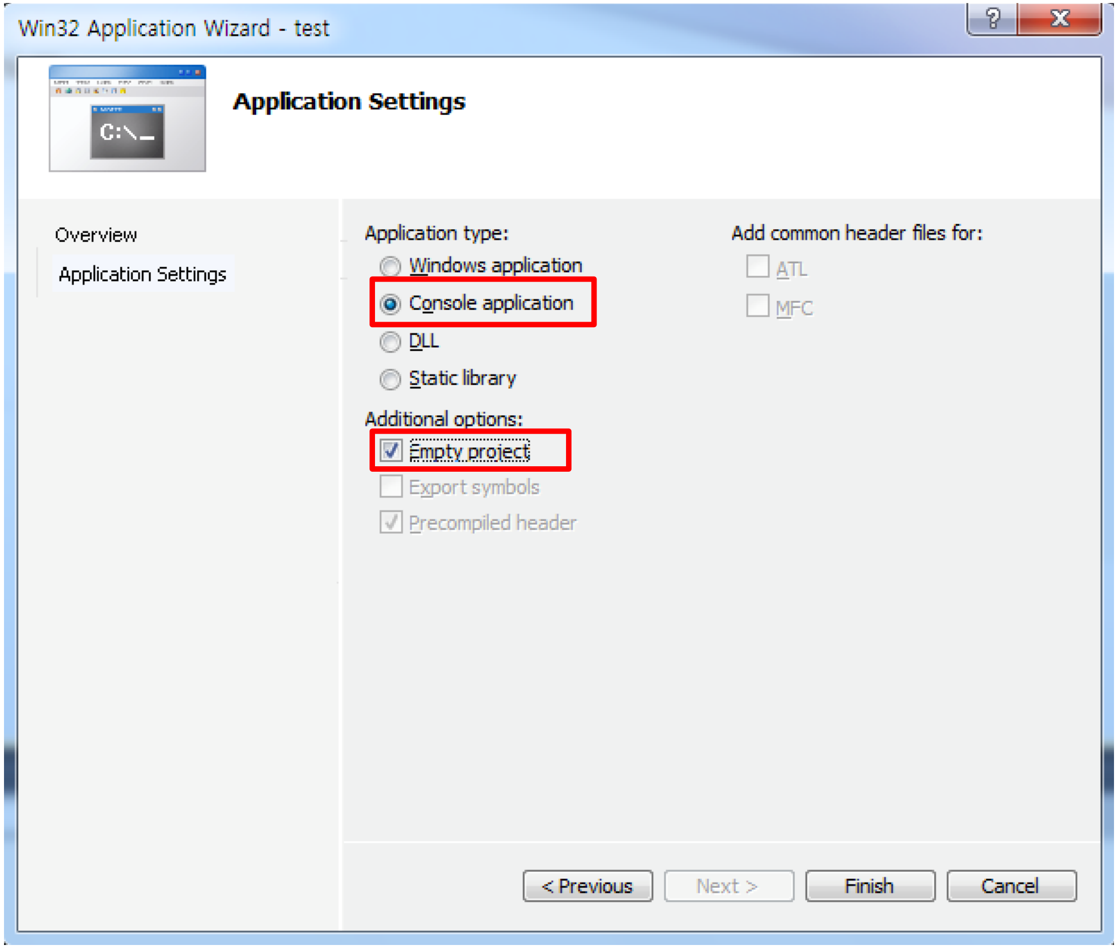
Solution name: test

□ Create directory for solution

□ Add to source control

Create a Project-2

- Select 'Console application' and 'Empty project'. Finish



Win32 Application Wizard - test

Application Settings

Application type:

○ Windows application
● Console application
○ DLL
○ Static library

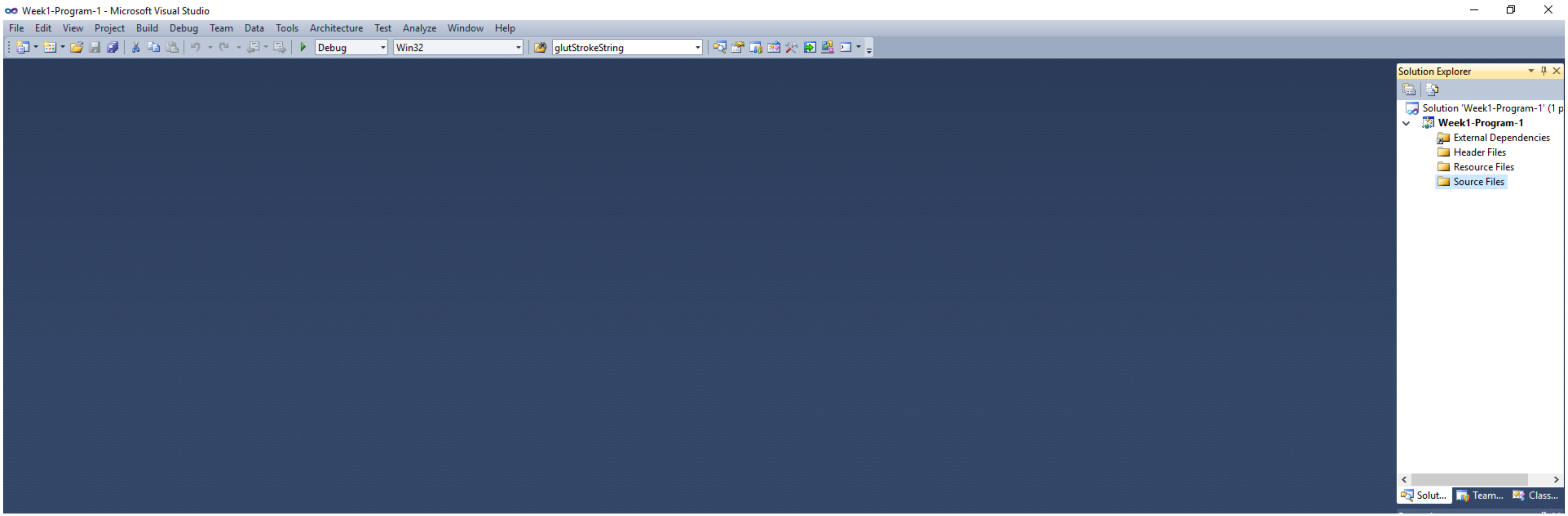
Additional options:

☑ Empty project
□ Export symbols
☑ Precompiled header

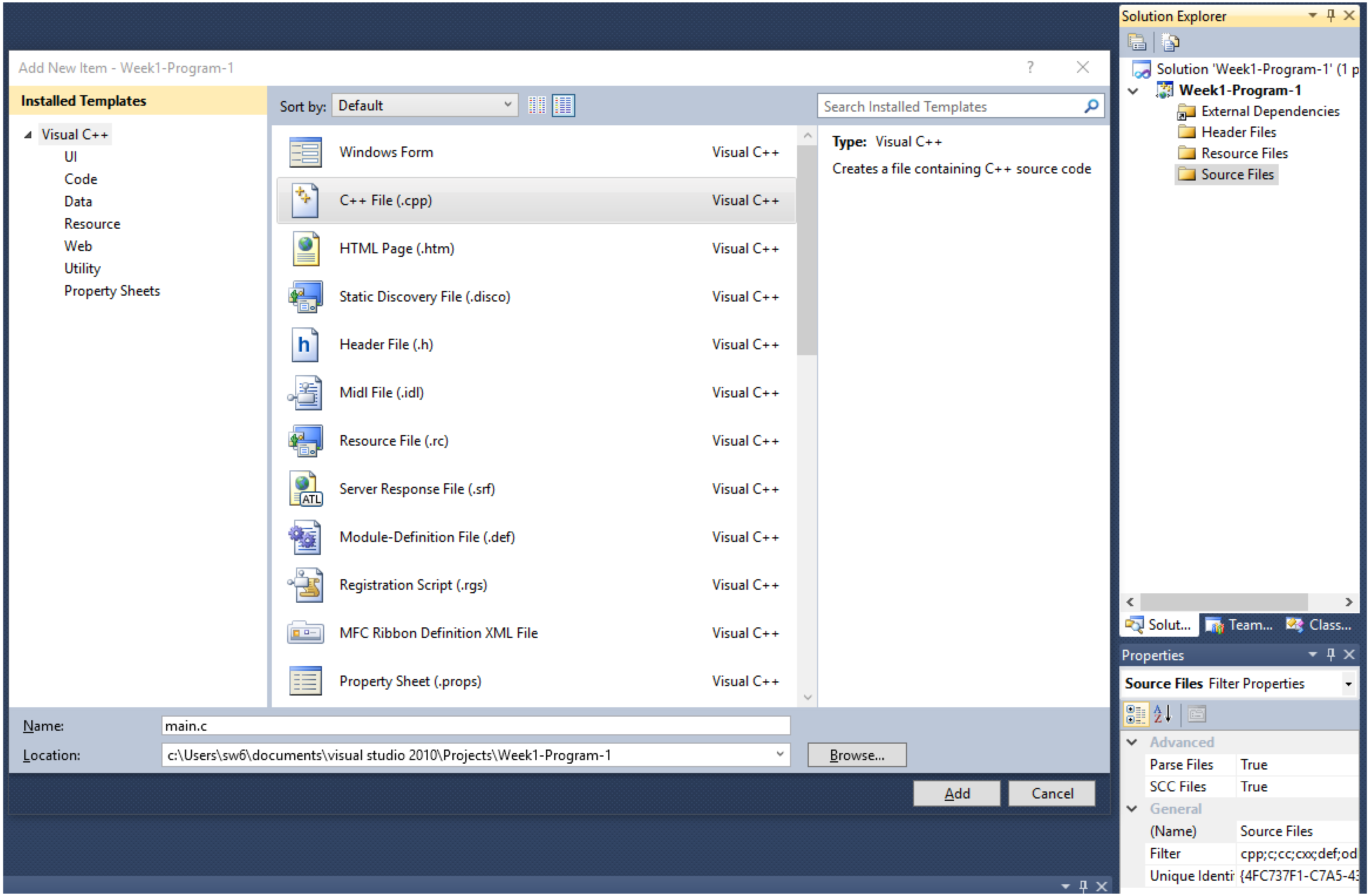
Add common header files for:

□ ATL
□ MFC

Create a Project-3


Week1-Program-1 - Microsoft Visual Studio
File Edit View Project Build Debug Team Data Tools Architecture Test Analyze Window Help
Debug
Win32
glutStrokeString
Solution Explorer
Solution 'Week1-Program-1' (1 p
Week1-Program-1
External Dependencies
Header Files
Resource Files
Source Files
Solut...
Team...
Class...

Create a Project-4


Add New Item - Week1-Program-1

Template	Type
Windows Form	Visual C++
C++ File (.cpp)	Visual C++
HTML Page (.htm)	Visual C++
Static Discovery File (.disco)	Visual C++
Header File (.h)	Visual C++
Midl File (.idl)	Visual C++
Resource File (.rc)	Visual C++
Server Response File (.srf)	Visual C++
Module-Definition File (.def)	Visual C++
Registration Script (.rgs)	Visual C++
MFC Ribbon Definition XML File	Visual C++
Property Sheet (.props)	Visual C++

Type: Visual C++

Creates a file containing C++ source code

Name: main.c

Location: c:\Users\sw6\documents\visual studio 2010\Projects\Week1-Program-1

Solution 'Week1-Program-1' (1 p

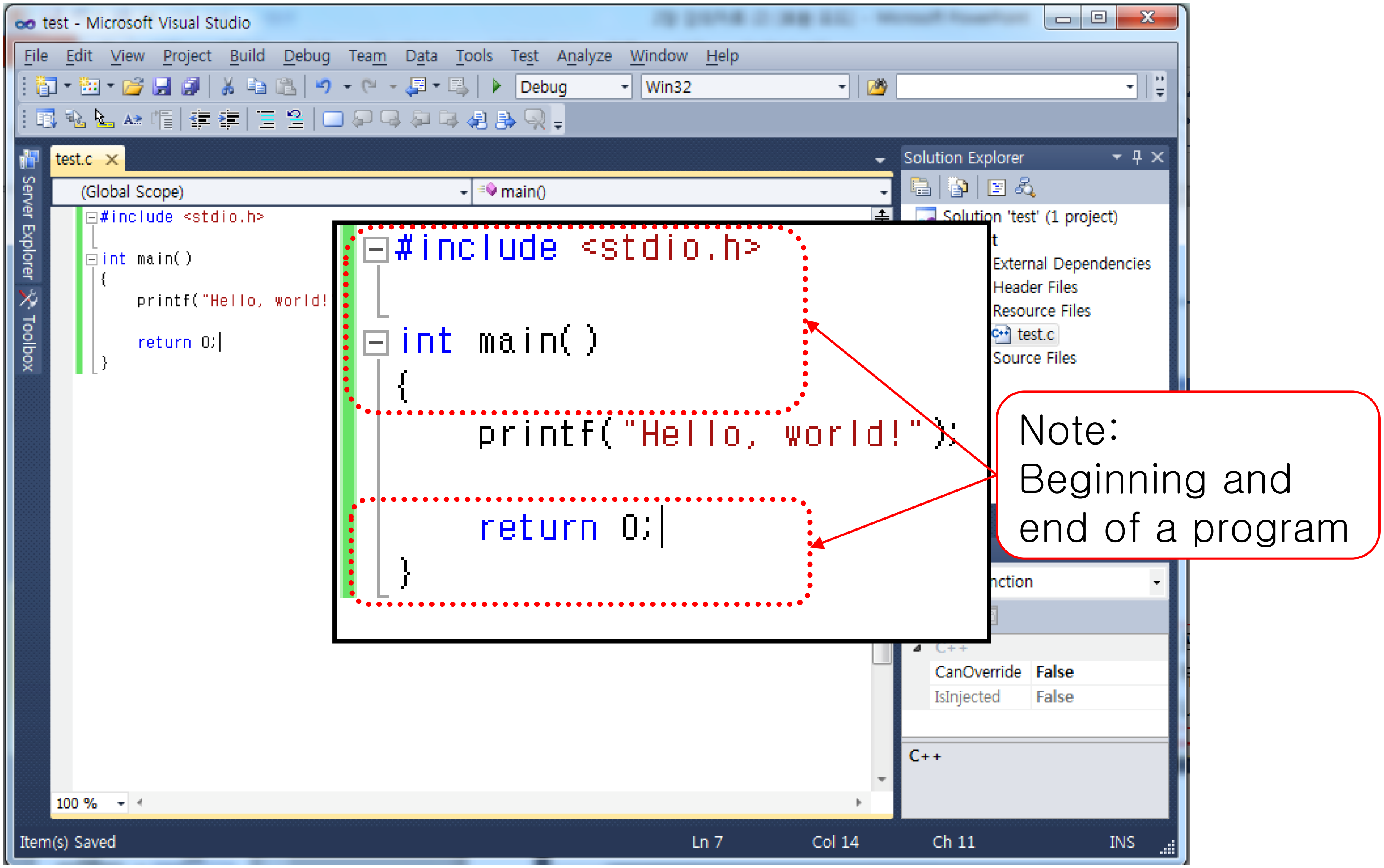
Week1-Program-1

Source Files Filter Properties

Parse Files	True
SCC Files	True
(Name)	Source Files
Filter	cpp;c;cc;cxx;def;od
Unique Identi	{4FC737F1-C7A5-4:

Create a Project-5

- Write a code.



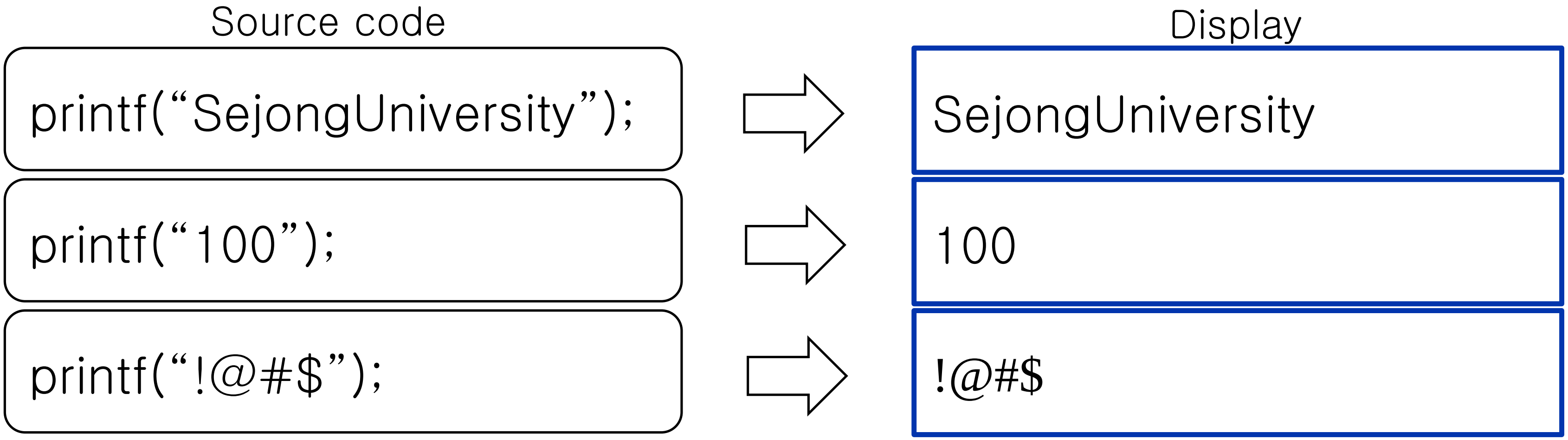
```
#include <stdio.h>

int main( )
{
	printf("Hello, world!");

	return 0;
}
```

Note:
Beginning and end of a program

printf()

- printf() 함수
  - Pre-defined C standard library
  - Display characters and numbers enclosed in double quotation marks (“ ”)

- Examples



Source code	Display
printf(“SejongUniversity”);	SejongUniversity
printf(“100”);	100
printf(“!@#$”);	!@#$

[Example 1] printf()

```
#include<stdio.h>

int main()
{

    printf(“SejongUniversity”);
    printf(“Freshmen”);
    printf(“Kim”);

    return 0;
}
```

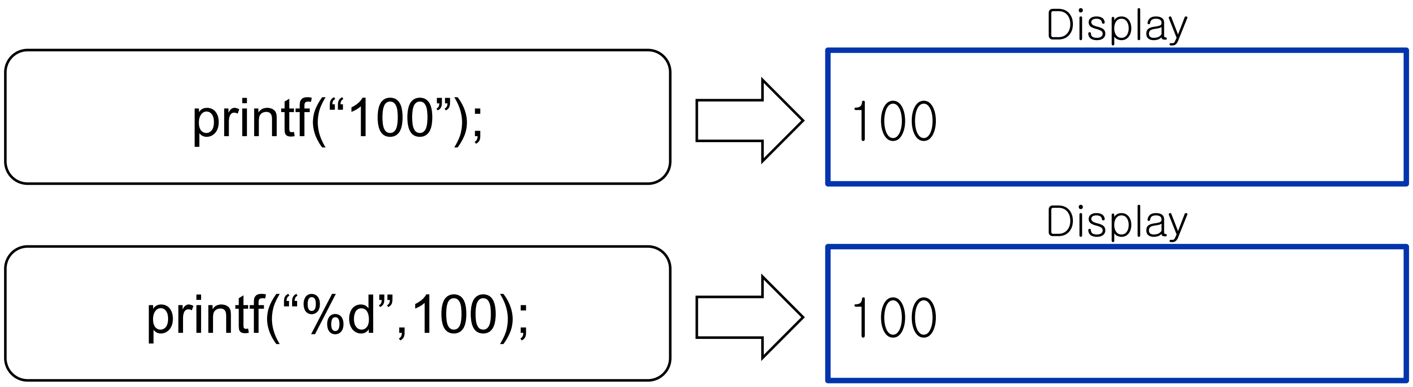
Display

```
SejongUniversityFreshmenKim
```

→ 1: Insert spaces
→ 2: Use only one printf() function

printf() Format

- printf() Format
  - Specify a format string



printf(“100”);

Display

100

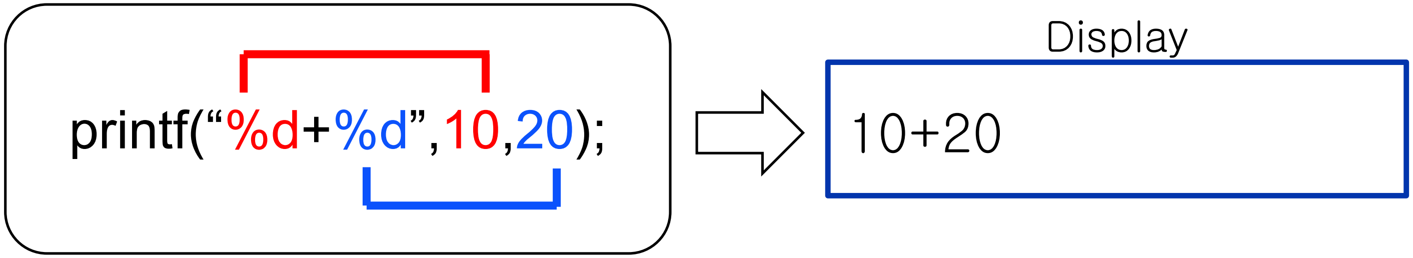
printf(“%d”,100);

Display

100

* %d: integer

  - Multiple format specifiers may be used



printf(“%d+%d”,10,20);

Display

10+20

* %d: integer

printf() Format

- Formats

Type	Example	Description
%d	10	Integer (decimal)
%x	100	Integer (hexademical)
%o	1234	Integer (octal)
%f or %lf	0.5	Real number
%c	‘a’ ‘A’	Character
%s	‘Hi’ ‘Hello’	Character string

printf() Format

- Integer

%d	→	1	2		
%4d	→			1	2
%04d	→	0	0	1	2

- Real number

%f	→	1	2	.	3	4	0	0	0	0
%7.1f	→				1	2	.	3		
%7.3f	→		1	2	.	3	4	0		

printf() Format

- Formats

Type	Description
\n	New line
\t	Tab
\b	Backspace
\r	Carriage return (move to the start of the current line)
\a	Alert user
\\	Print \
\’	Print ‘
\”	Print “

[Example 2]printf()

```
#include <stdio.h>

void main()
{
        printf("100");
        printf(“₩n");
        printf("%d", 100);
        printf(“₩n");
}
```

New line

```
#include <stdio.h>

void main()
{
        printf("100+200");
        printf(“₩n");
        printf("%d", 100+200);
        printf(“₩n");
}
```

→ Discuss the result and run the source code

[Example 3] printf(): Variable

```
int main()
{
    int c;

    c=10+20;

    printf("c=10+20 print:");
    printf("₩n");
    printf("%d", c);

    return 0;
}
```

Int: integer variable
(Will be discussed in Ch 3)

```
int main()
{
    int a=10;
    int b=20;
    int c;

    c=a+b;

    printf("c=a+b print:");
    printf("₩n");
    printf("%d", c);

    return 0;
}
```

scanf()

- scanf()
  - Read an input from a user via Command window
  - Require a format string in between (“”) to specify the appearance of the input
  - Put & symbol in front of a variable
  - The same number and type of format strings and variables

- Example

```
int a=0;
int b=0;

scanf(“%d”,&a);
scanf(“%d”,&b);
```

1 Input

```
int a=0;
int b=0;

scanf(“%d%d”,&a,&b);
```

2 Inputs

[Example 4]scanf()

```
#include<stdio.h>

int main()
{
    int id;

    printf(“Enter Stduent ID: ”);
    scanf(“%d”,&id);
    printf(“ID: %d₩n”,id);

    return 0;
}
```

Display

```
Enter Student ID: 16011111
ID: 16011111
```

[Example 5]scanf()

```
#include<stdio.h>

int main()
{
    int id, age;

     printf(“Enter Student ID: ”);
     scanf(“%d”,&id);
     printf(“ID: %d₩n”,id);

     printf(“Enter Age: ”);
     scanf(“%d”,&age);
     printf(“Age: %d₩n”,age);

     return 0;
}
```

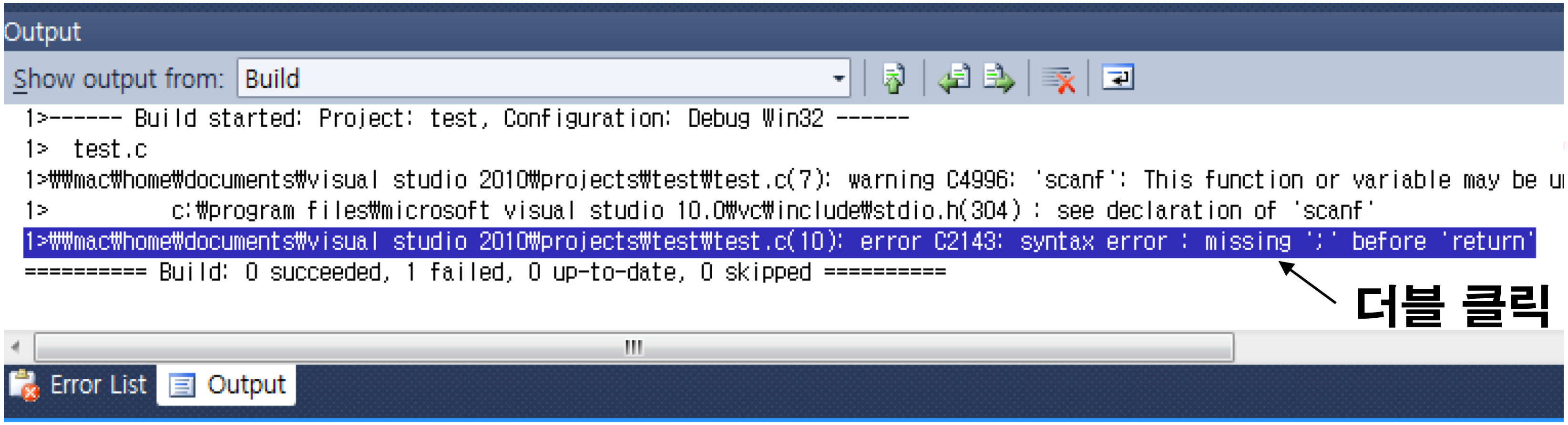
Display

```
Enter Student ID: 16011111
ID: 16011111
Enter Age: 20
Age: 20
```

→ Use scanf() once, obtain both id and age

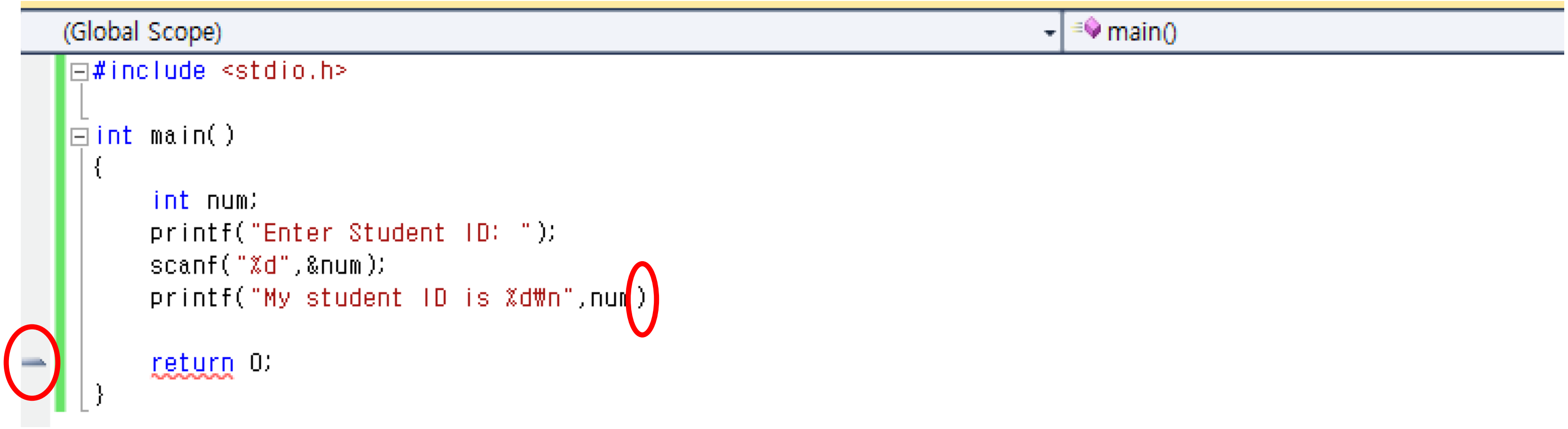
Debugging-1

- Error on output



```
1>------ Build started: Project: test, Configuration: Debug Win32 ------
1>  test.c
1>₩₩mac₩home₩documents₩visual studio 2010₩projects₩test₩test.c(7): warning C4996: 'scanf': This function or variable may be u
1>          c:₩program files₩microsoft visual studio 10.0₩vc₩include₩stdio.h(304) : see declaration of 'scanf'
1>₩₩mac₩home₩documents₩visual studio 2010₩projects₩test₩test.c(10): error C2143: syntax error : missing ';' before 'return'
========== Build: 0 succeeded, 1 failed, 0 up-to-date, 0 skipped ==========
```

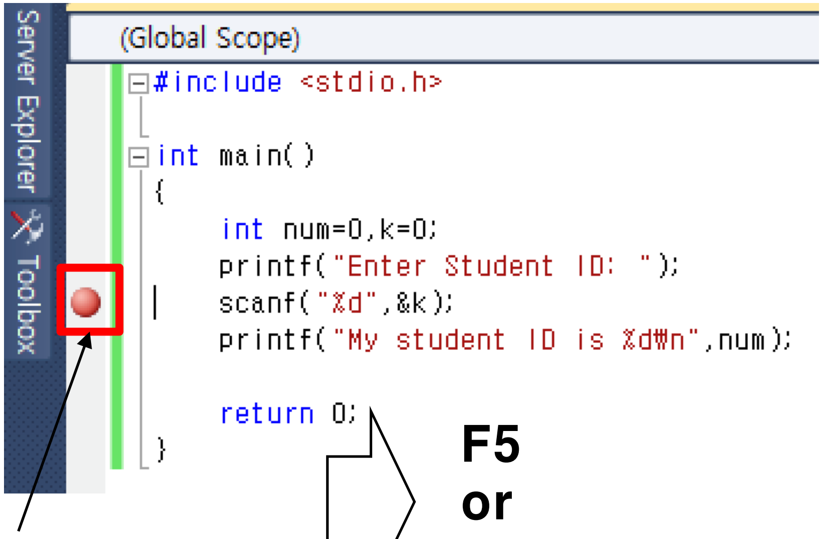
더블 클릭



```c
#include <stdio.h>

int main()
{
    int num;
    printf("Enter Student ID: ");
    scanf("%d",&num);
    printf("My student ID is %d₩n",num)

    return 0;
}
```

Debugging-2

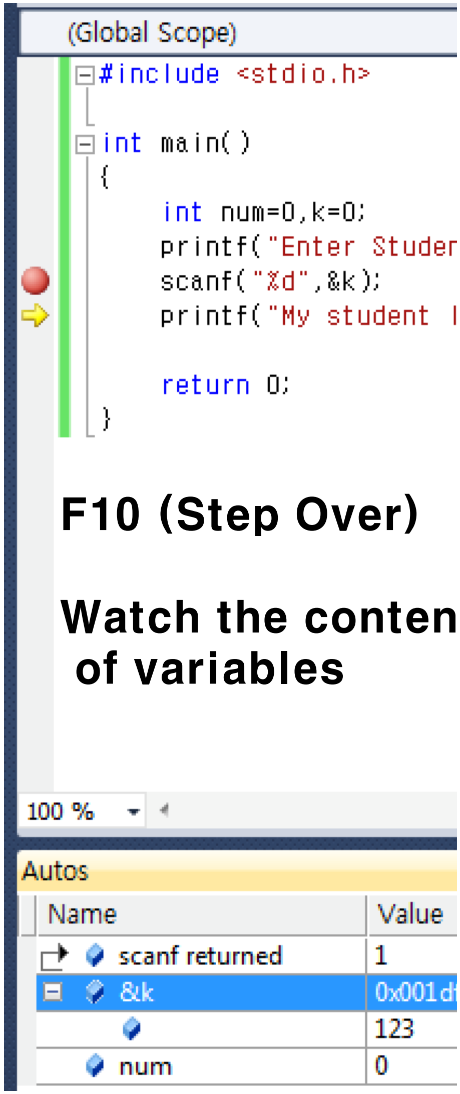
- Debugging Tool



```
#include <stdio.h>

int main()
{
    int num=0,k=0;
    printf("Enter Student ID: ");
    scanf("%d",&k);
    printf("My student ID is %d₩n",num);

    return 0;
}
```

Insert a breakpoint

F5
or
Debug -> Start Debugging



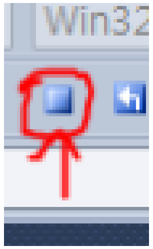
```
#include <stdio.h>

int main()
{
    int num=0,k=0;
    printf("Enter Studer
    scanf("%d",&k);
    printf("My student I

    return 0;
}
```

Autos

Name	Value
scanf returned	1
&k	0x001d
	123
num	0

F10 (Step Over)

Watch the contents of variables



Stop Debug (shift+F5)
Correct errors