SIEC: C PROGRAMMING
L #01: C PROGRAMMING INSTALLATION AND STRUCTURES

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CHONBUK NATIONAL UNIVERSITY

Outline

- **C Language Overview**
  - C programming language
  - Why to use C ?

- **C Program Installation on Windows**

- **C Programming Process**
  - Theory
  - Practice

C Language Overview

- C programming language
- Why to use C ?

C Language Overview

- C programming language

  - The C language stands for one of the promised forms of computer programing languages that people and compilers can understand.

- Compiler (C, C++)

  - The compiler, that is as an interpreter between humans and machines, is a converter that changes the programming language into a machine-understandable machine language which is composed of 0 and 1.

| C language | Compiler | Machine language |

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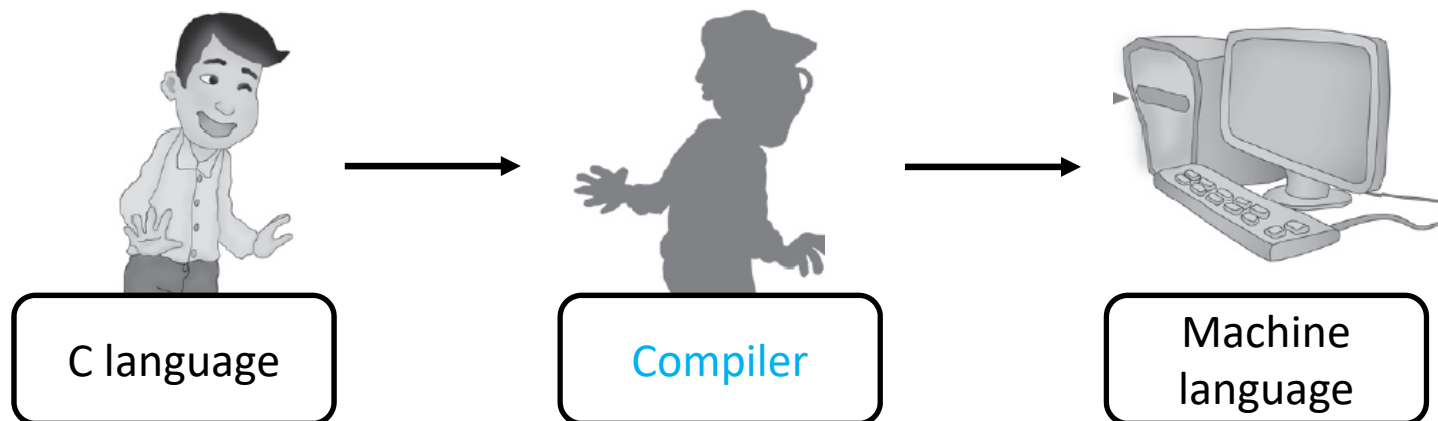
C Language Overview

- Why to use C ? (Advantages)

  - It is easy to learn.

  - It is a structured language.

  - It produces efficient programs.

  - It can handle low-level activities If you need to control.

    ➢ The low-level language is that the people can not understand directly the code because the code is composed of 0 and 1 for machine.

    ➢ The high-level language is that the people can understand directly when they read the code.

  - It can be compiled on a variety of computer platforms.

- Disadvantages

  - It is more difficult to learn than the **perfect** high-level languages.

  - So, It requires a lot of programming attention.

C Program Installation on Windows

C Program Installation on Windows

- Find the Microsoft Visual Studio Community

- Type the Microsoft Visual Studio Community on the google website

C Program Installation on Windows

- Download the VS Community

• Click this button.

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C Program Installation on Windows

- Download the VS Community

- Check the file

C Program Installation on Windows

- Open the download folder
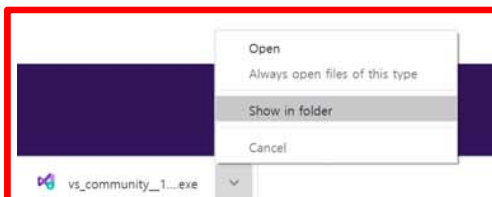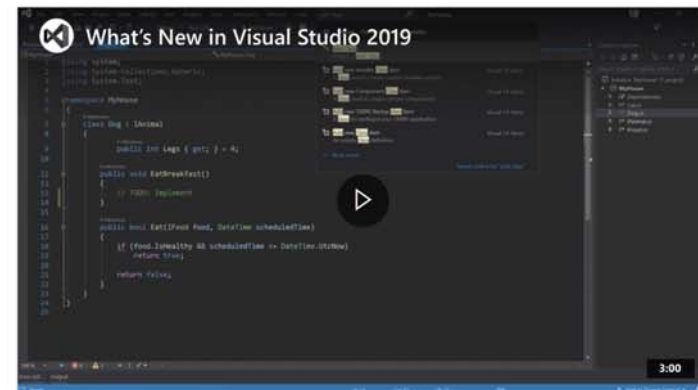
- Click the right mouse button on the download file.
- Select the open folder icon (폴더 열기).

C Program Installation on Windows

▪ Check the VS community 2017
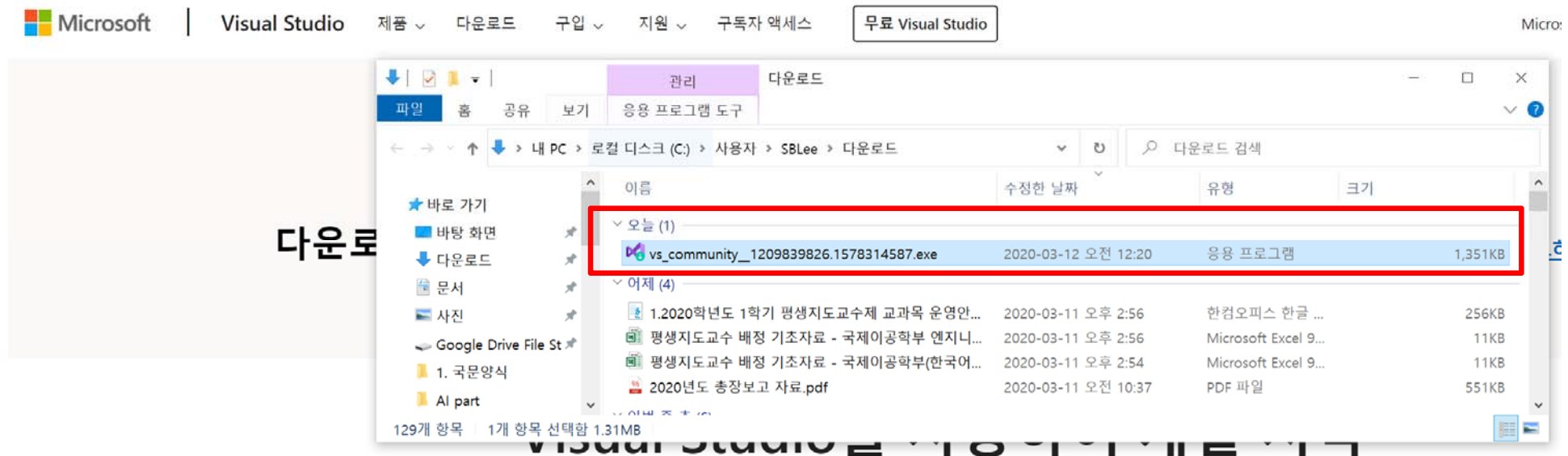
- The download folder will be opened.
- You can find the vs_community program in the download folder.

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C Program Installation on Windows

- Run the VS community 2017 as administrator
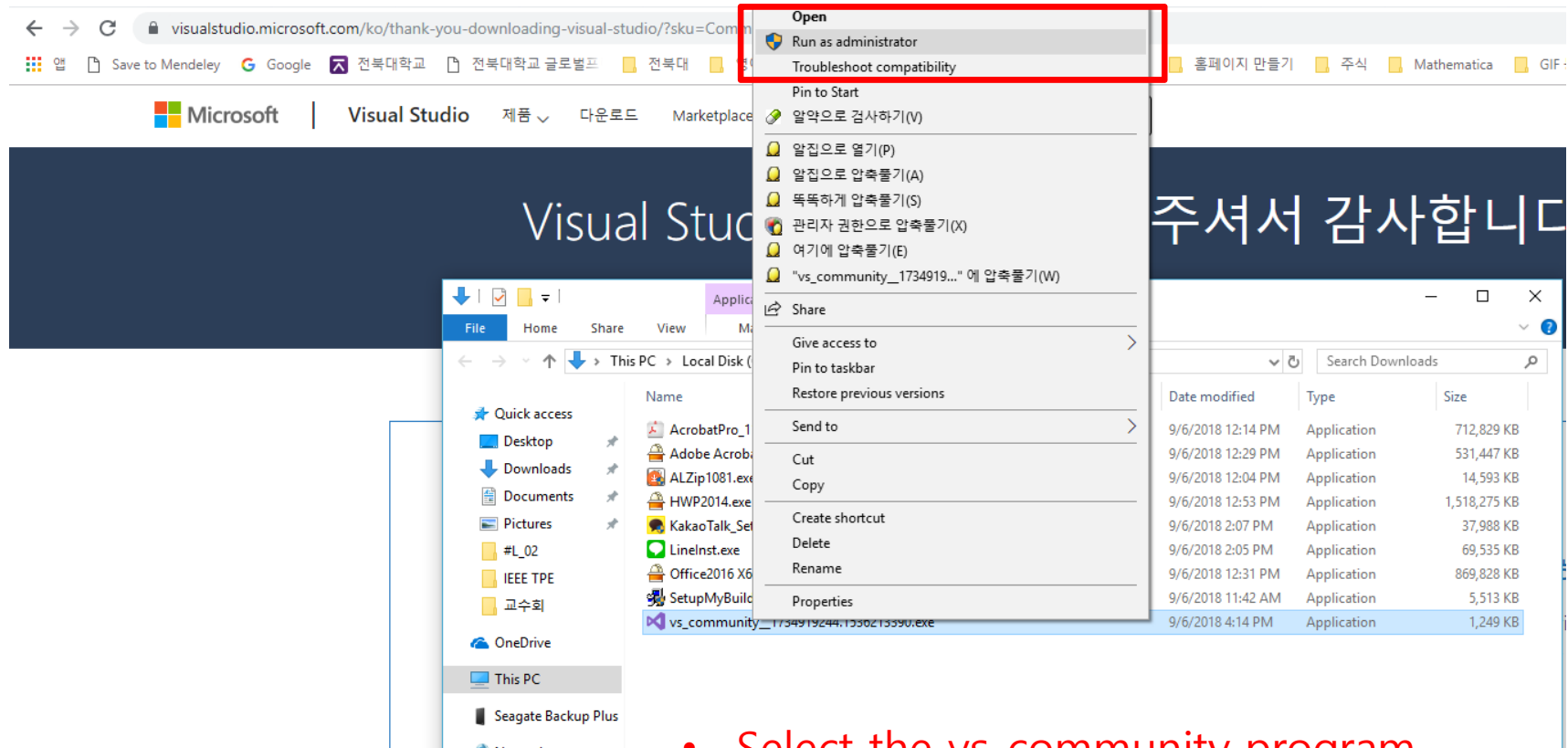
- Select the vs_community program.
- Click the right mouse button.
- Click the run as administrator.

C Program Installation on Windows

- Run the VS community 2017 as administrator
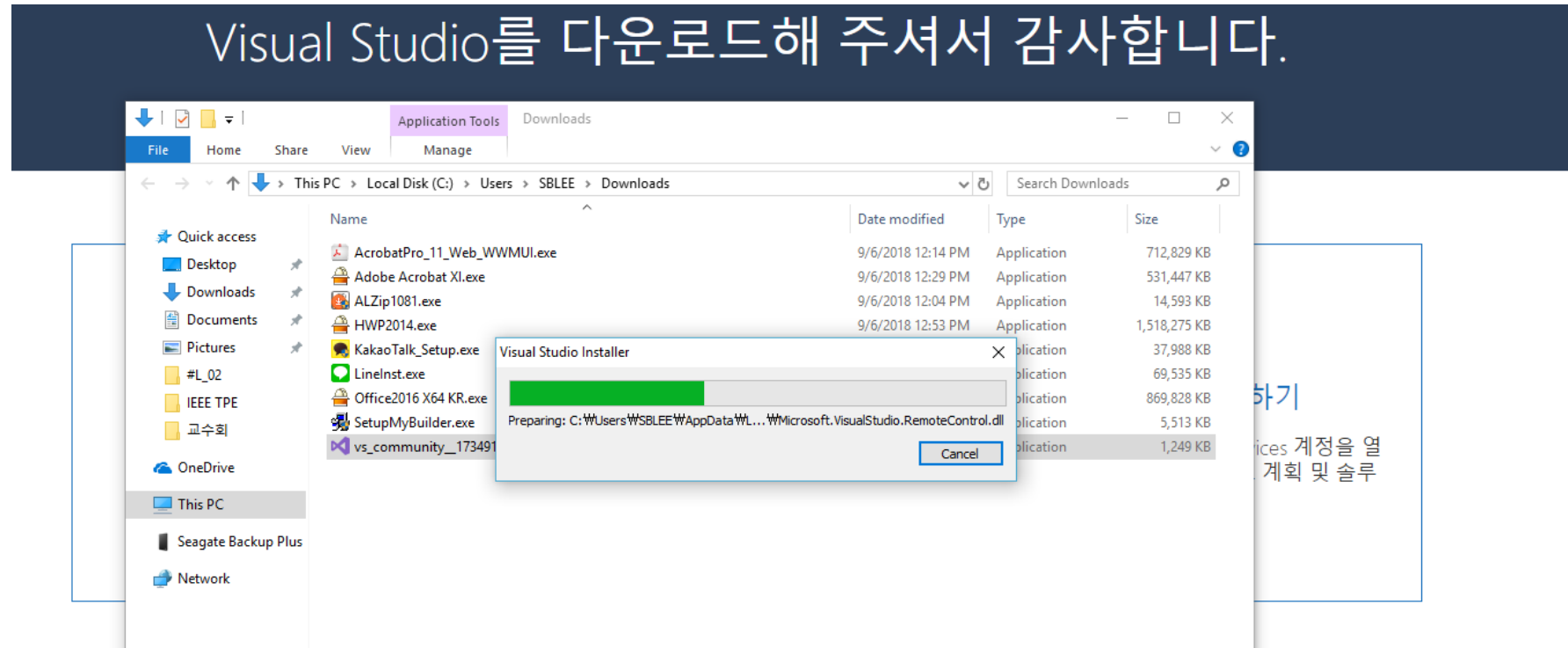
- You can check the installation process for the VS community.

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C Program Installation on Windows

- Read and Check the Microsoft Privacy
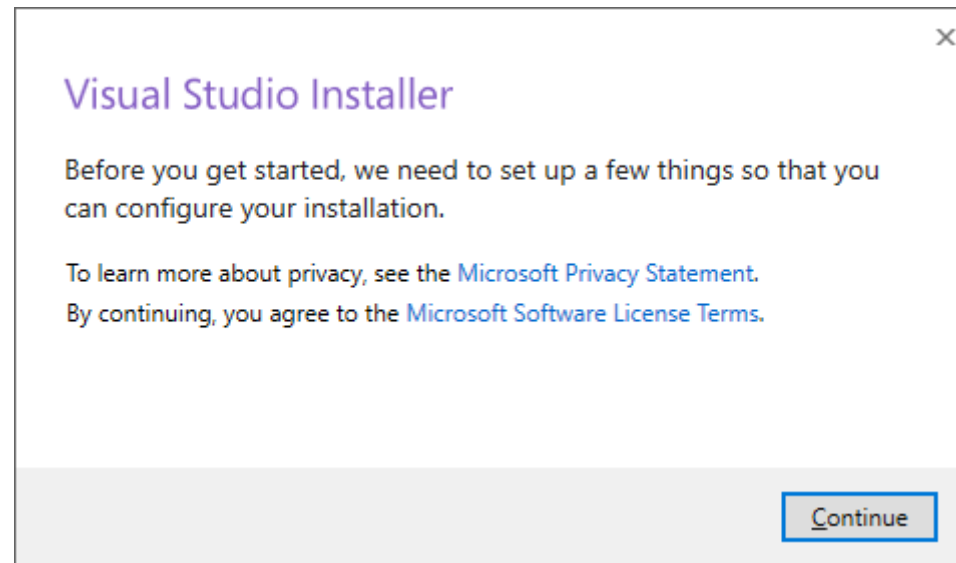
- Check the Microsoft Privacy for installing the Visual Studio Community.

C Program Installation on Windows
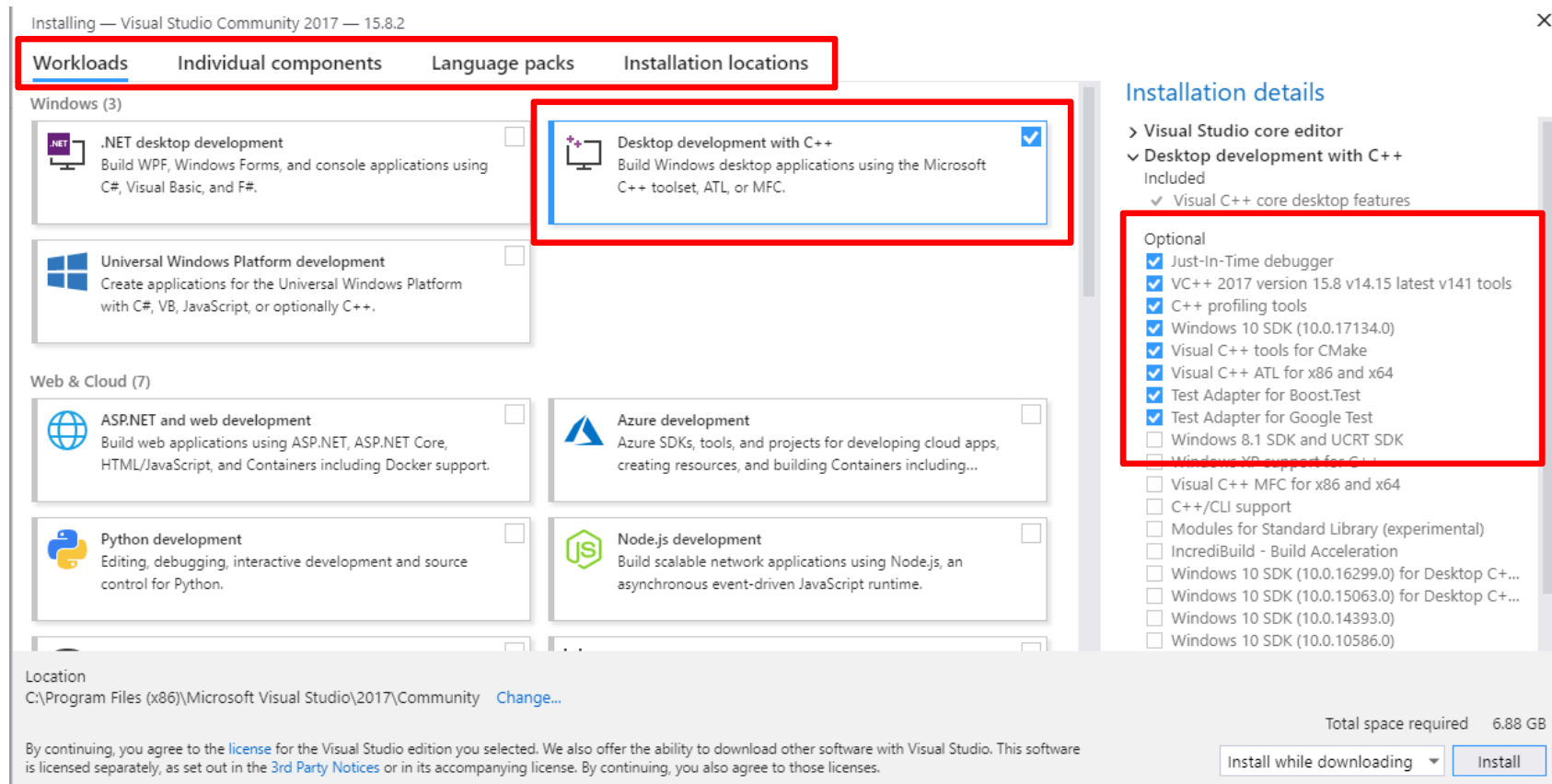
- Installation details

- Select the installation details.

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C Program Installation on Windows

- Installation details
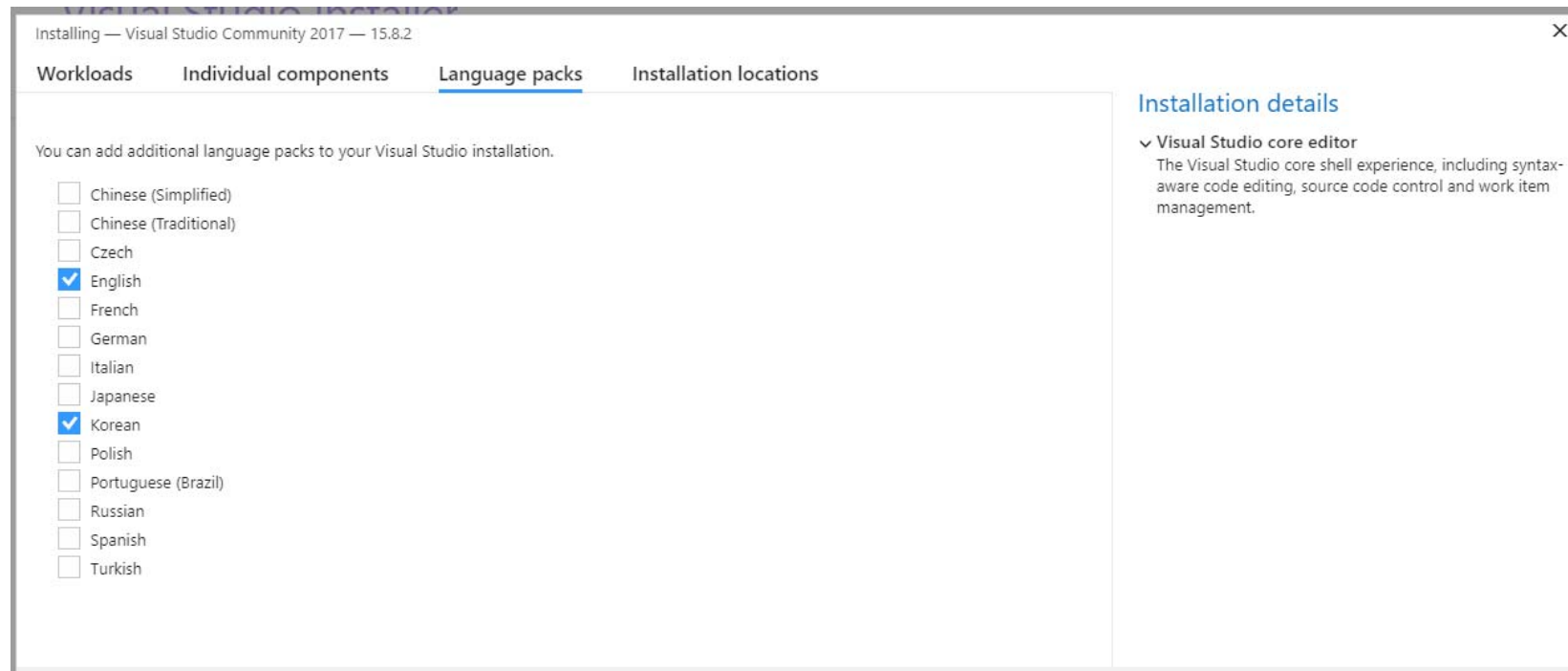
- • Select the language you want to use.

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C Program Installation on Windows

- Installation details
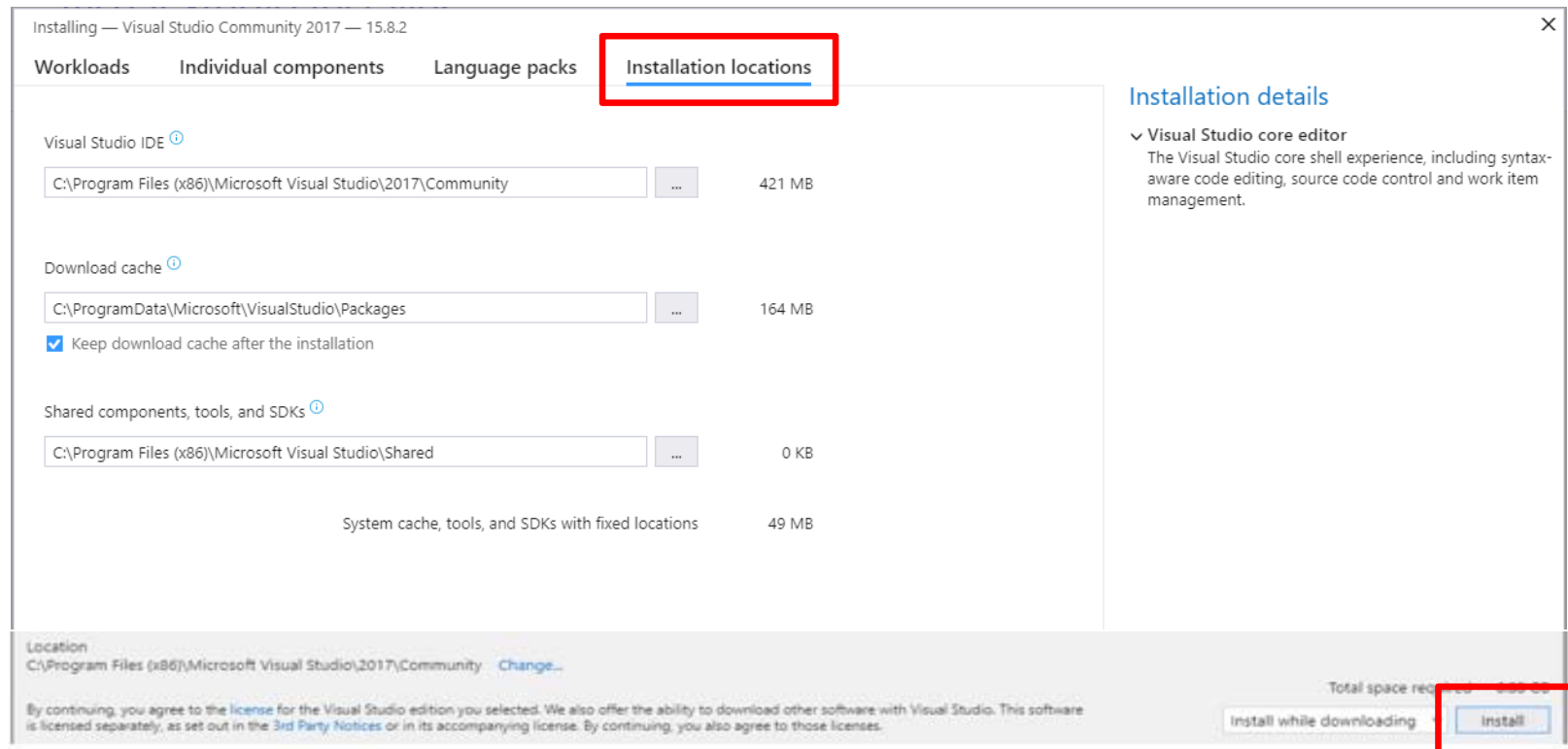
- Select the installation locations.
- Recommend using the default location.

C Program Installation on Windows

- Installation details
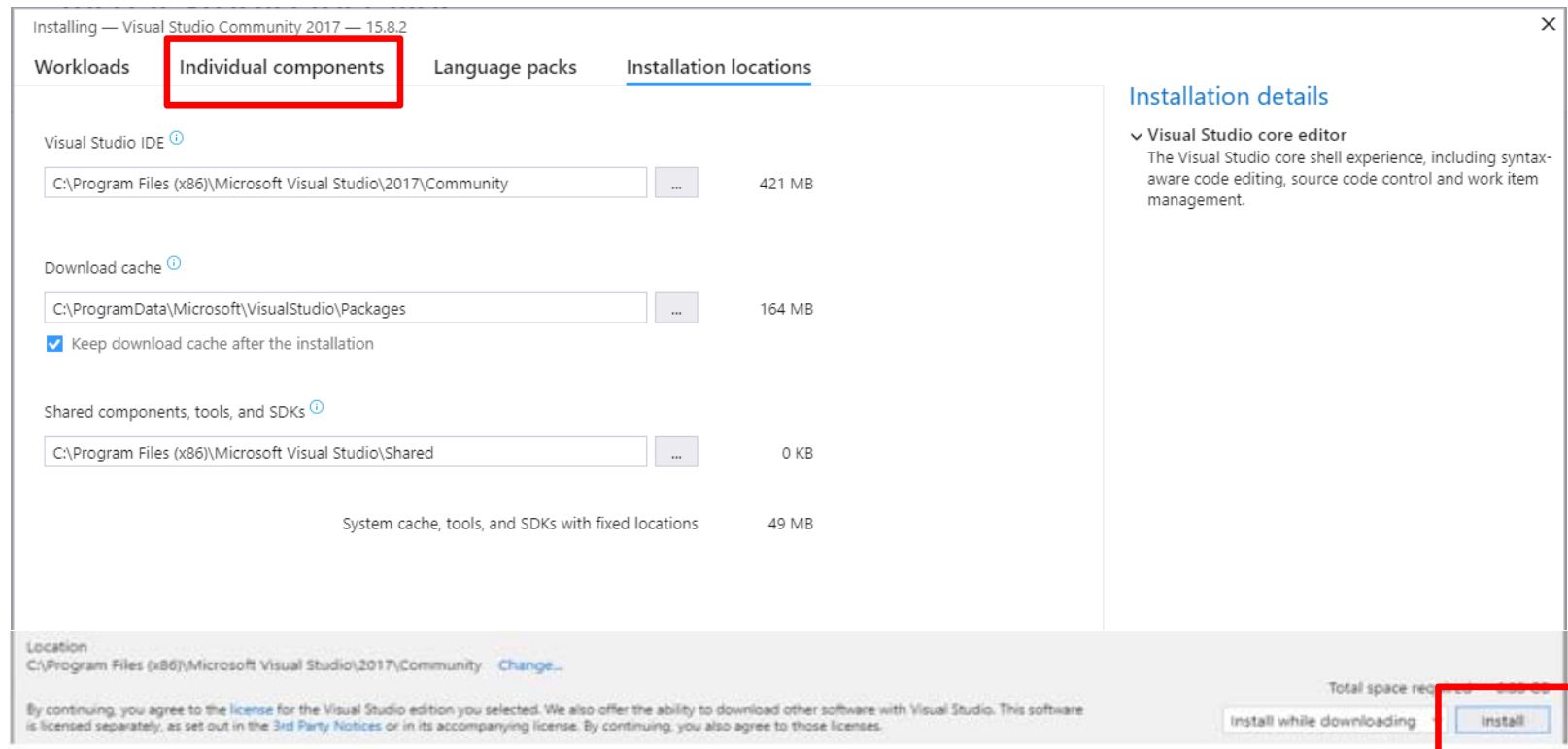
- Recommend skipping the individual components parts.
- Click the installation button.

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C Program Installation on Windows

- Installation

- See the process of the installation

C Program Installation on Windows

- Installation

- See the process of the installation

C Program Installation on Windows

- Installation

- See the process of the installation

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C Program Installation on Windows

- Restart your computer
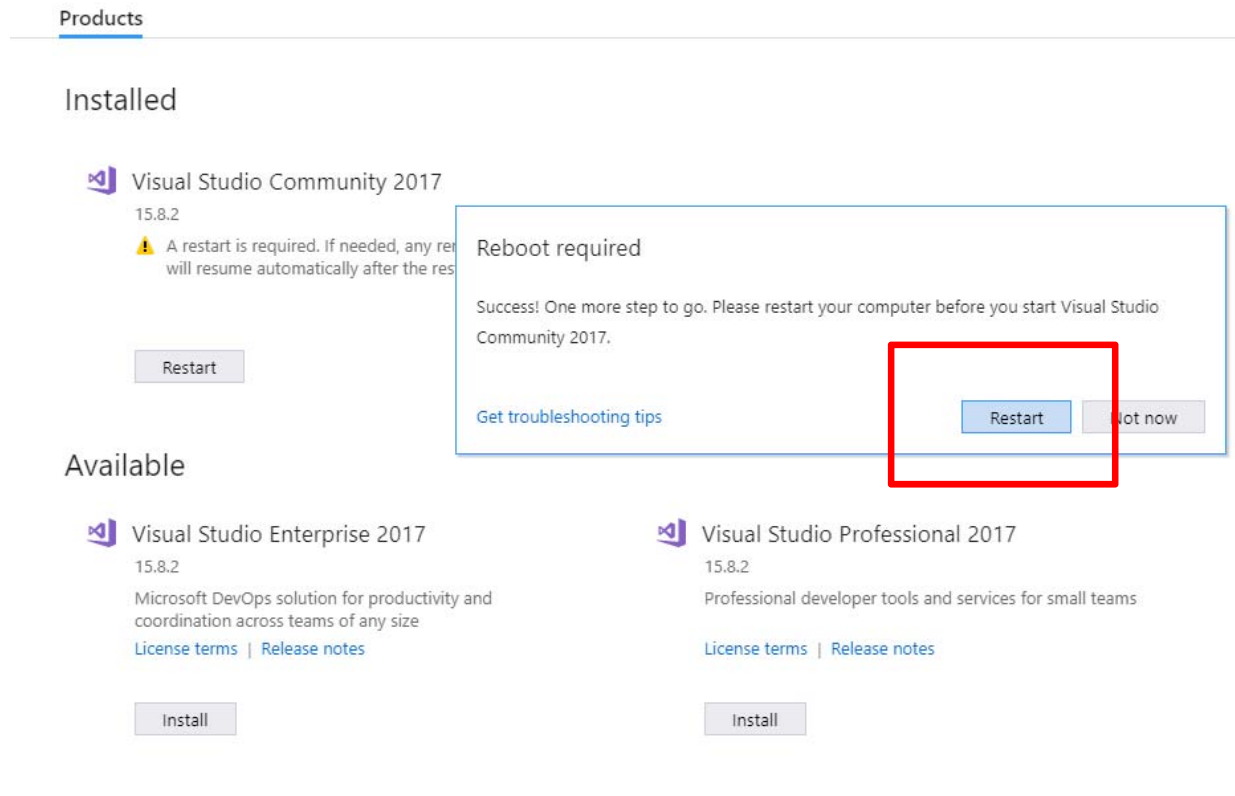
- Restart your computer after the process of the installation is complete.
- Click the restart button.

C Program Installation on Windows

- Check the Visual Studio Installation
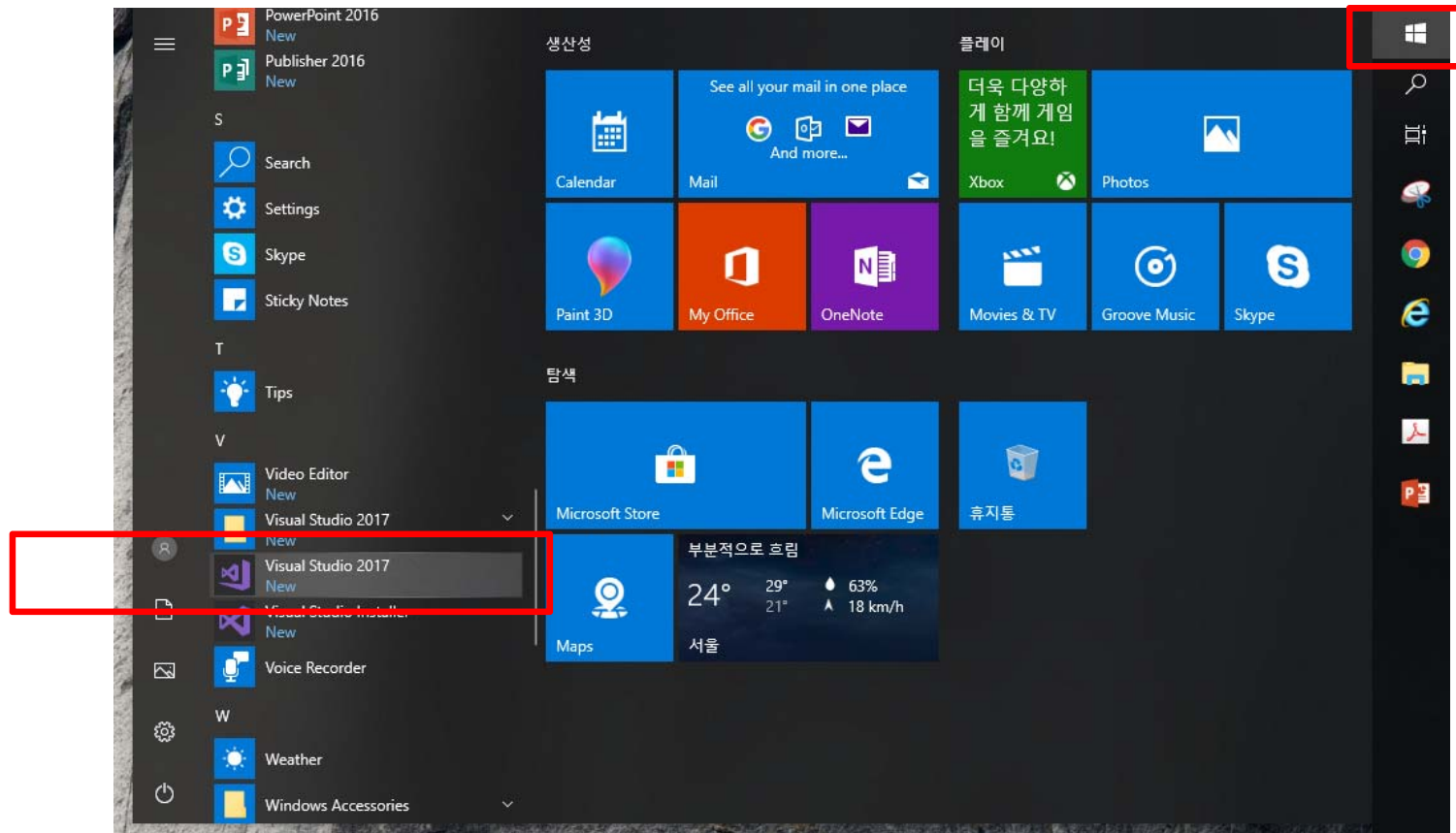
- Click the Windows button.
- Scroll down and search for the Visual Studio **2019.**
- Click the Visual Studio 2019

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C Program Installation on Windows

- Account & Sign in
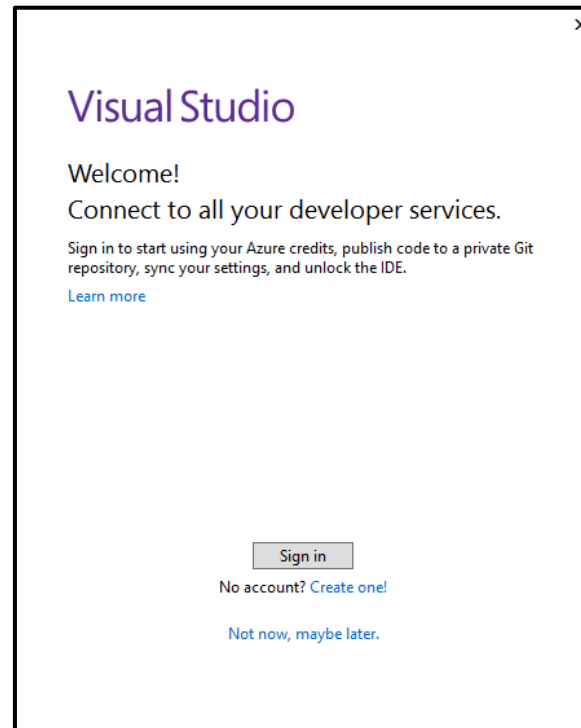
- • Directly sign in if you have an account for Microsoft Visual studio
- • Create an account and sign in.

C Program Installation on Windows

- Set the development environment
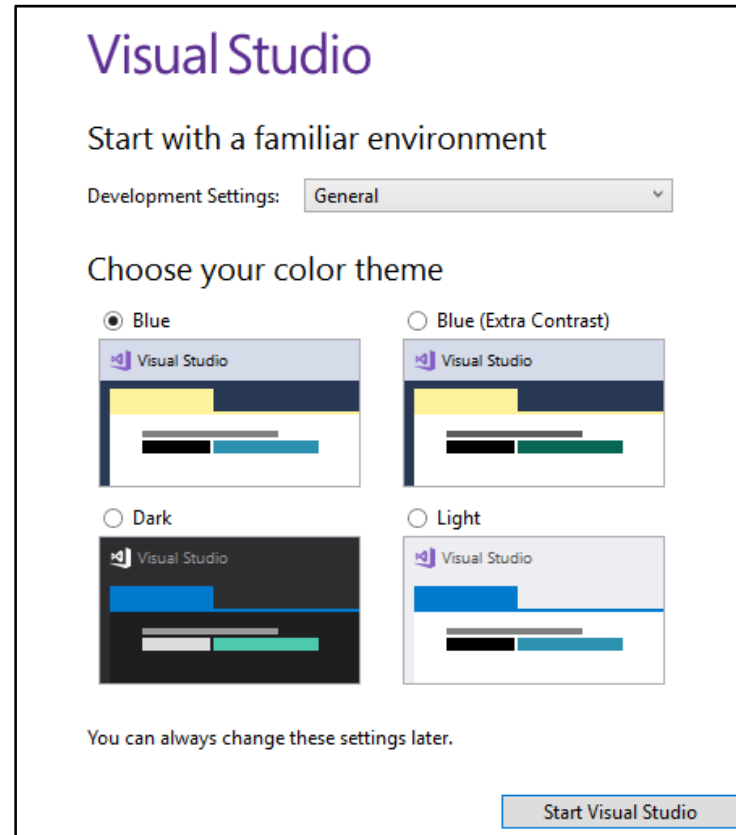
- Choose the development environment such as color.
- Complete the Installation of the Visual Studio for learning C language through all of these processes.

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C Programming Process

- Theory
- Practice

C Programming Process

- Flowchart of the C Programming Process

```
                    ┌─────────────────────────┐
                    │   1. Making a program   │
                    └─────────────────────────┘
                               │ *.c
                               ▼
                    ┌─────────────────────────┐
           ┌───────▶│       2. Compile        │
           │        └─────────────────────────┘
           │                   │
┌────────────────────┐  Yes    ◇
│ Revising the program│◀──────< Checking errors >
└────────────────────┘         ◇
           ▲                   │ No  *.obj
           │                   ▼
           │        ┌─────────────────────────┐
           │        │        3. Link          │
           │        └─────────────────────────┘
           │                   │
           │   Yes             ◇
           └──────────────────< Checking errors >
                               ◇
                               │ No  *.exe
                               ▼
                    ┌─────────────────────────┐
                    │ 4. Loading the execution│
                    │     file to CPU         │
                    └─────────────────────────┘
```
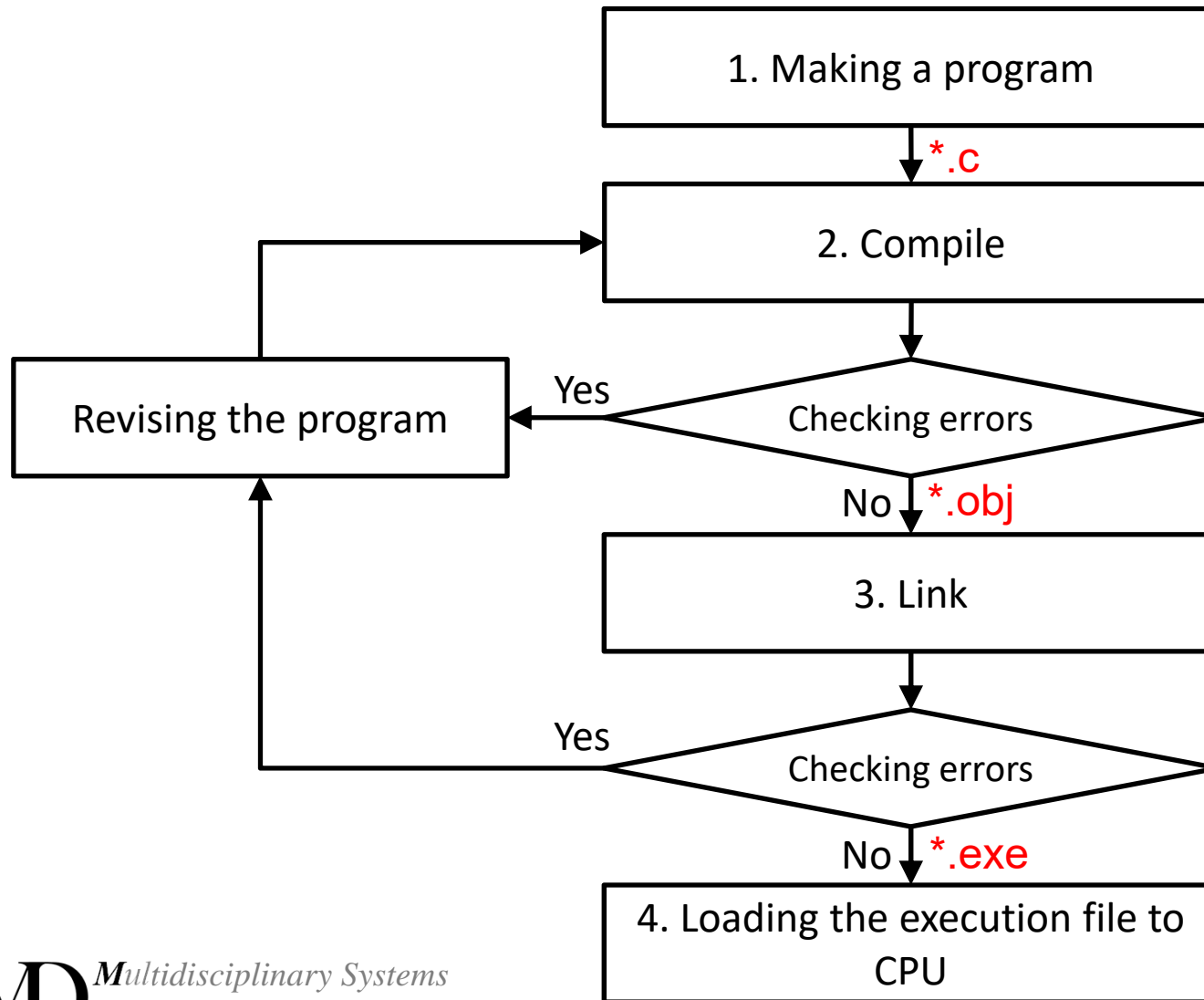
C Programming Process

- 1. Making a program
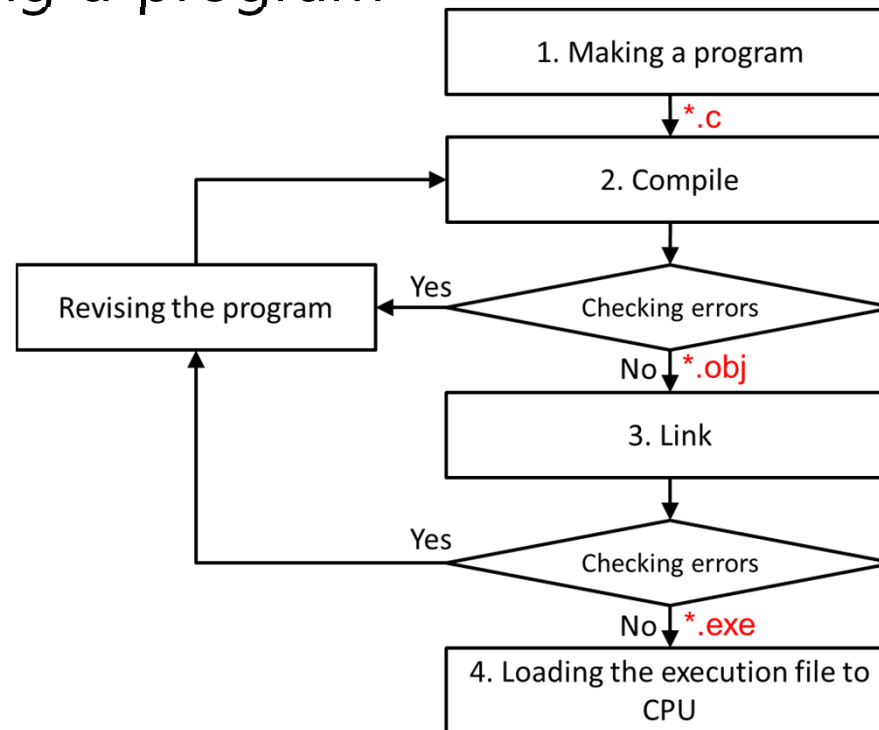
- First, A programmer makes a program.

C Programming Process

- 2. Compile

```
┌─────────────────────────────────┐
│      1. Making a program        │
└─────────────────────────────────┘
                │ *.c
                ▼
┌─────────────────────────────────┐
│          2. Compile             │
└─────────────────────────────────┘
                │
                ▼
┌──────────────────┐  Yes  ◇ Checking errors ◇
│ Revising the     │◄──────
│ program          │       No │ *.obj
└──────────────────┘          ▼
                    ┌─────────────────────────┐
                    │        3. Link          │
                    └─────────────────────────┘
              Yes             │
         ◄──────────  ◇ Checking errors ◇
                              No │ *.exe
                                 ▼
                    ┌─────────────────────────┐
                    │ 4. Loading the execution│
                    │     file to CPU         │
                    └─────────────────────────┘
```
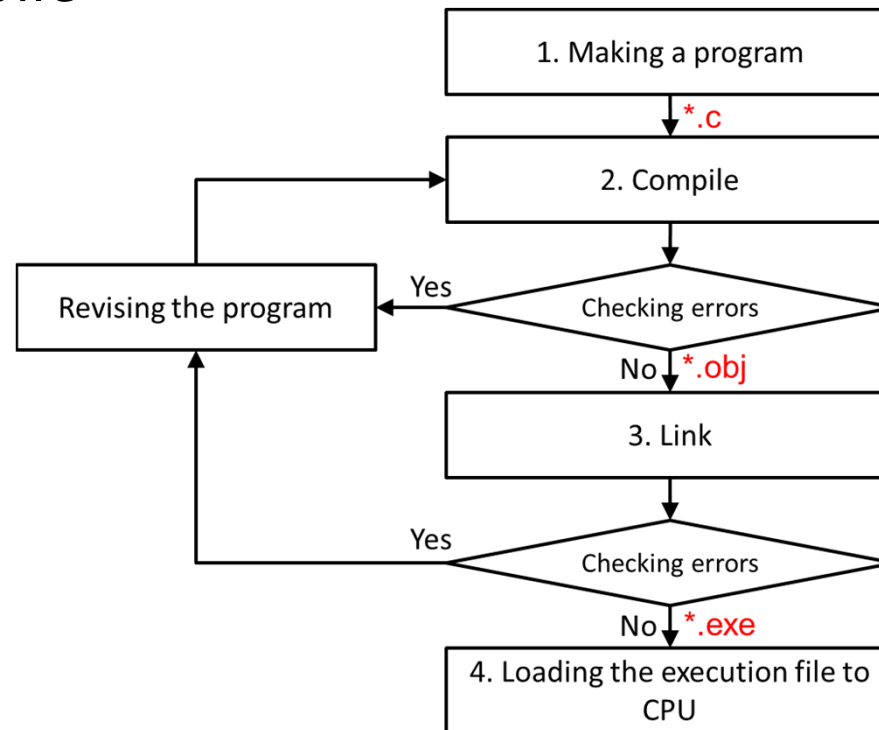
- The compiler compiles the program and checks the program errors.
- If the program has the errors, the compiler will ask you to revise the program.
- But, If not, the compiler makes the object file of the program.

C Programming Process

- 3. Link


```
1. Making a program
        │ *.c
        ▼
2. Compile
        │
        ▼
Checking errors ──Yes──► Revising the program
        │ No  *.obj              │
        ▼                        │
3. Link ◄────────────────────────┘
        │
        ▼
Checking errors ──Yes──► (to Revising the program)
        │ No  *.exe
        ▼
4. Loading the execution file to CPU
```
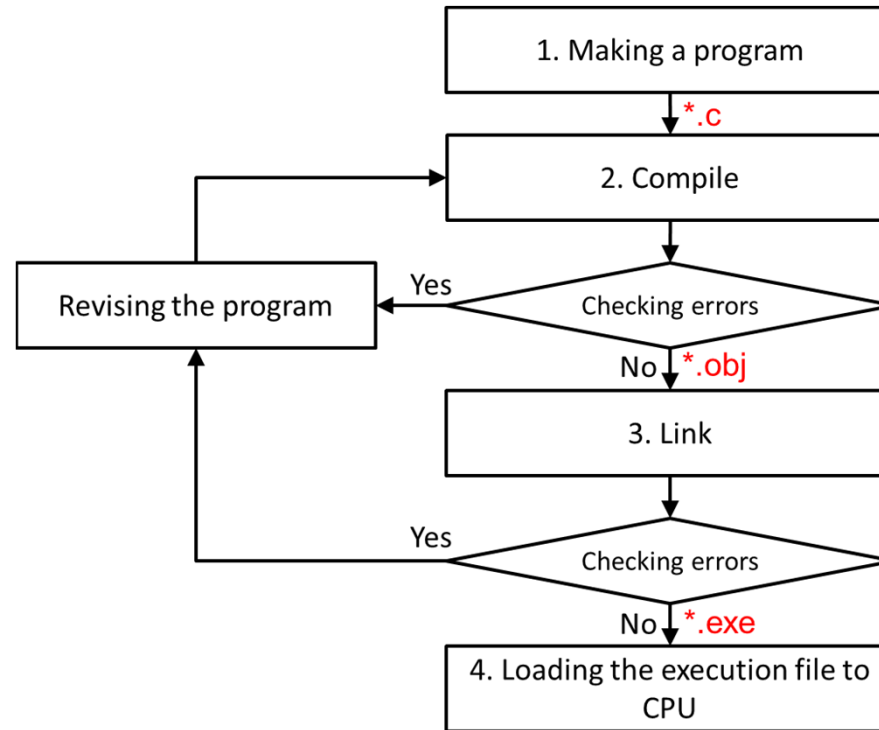
- The linker combines between the object file made by the compiler and standard library functions.
- In this process, if the error doesn't check, the linker makes the execution file.

C Programming Process

- 4. Loader


```
        ┌─────────────────────────┐
        │  1. Making a program     │
        └─────────────────────────┘
                   │ *.c
                   ▼
        ┌─────────────────────────┐
   ┌───▶│      2. Compile          │
   │    └─────────────────────────┘
   │                │
   │                ▼
┌──────────────┐ Yes  ╱╲
│ Revising the │◀─────  Checking errors
│ program      │       ╲╱
└──────────────┘      No │ *.obj
   ▲                     ▼
   │         ┌─────────────────────────┐
   │         │        3. Link           │
   │         └─────────────────────────┘
   │                     │
   │             Yes     ▼
   └─────────────────  ╱╲
                        Checking errors
                       ╲╱
                      No │ *.exe
                         ▼
        ┌─────────────────────────┐
        │ 4. Loading the execution │
        │    file to CPU           │
        └─────────────────────────┘
```
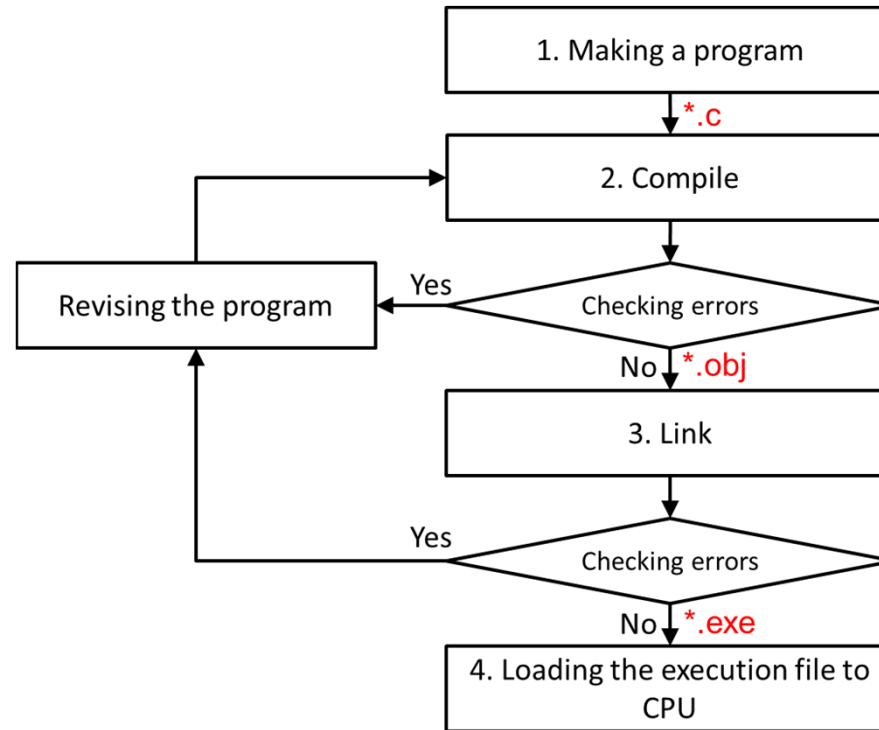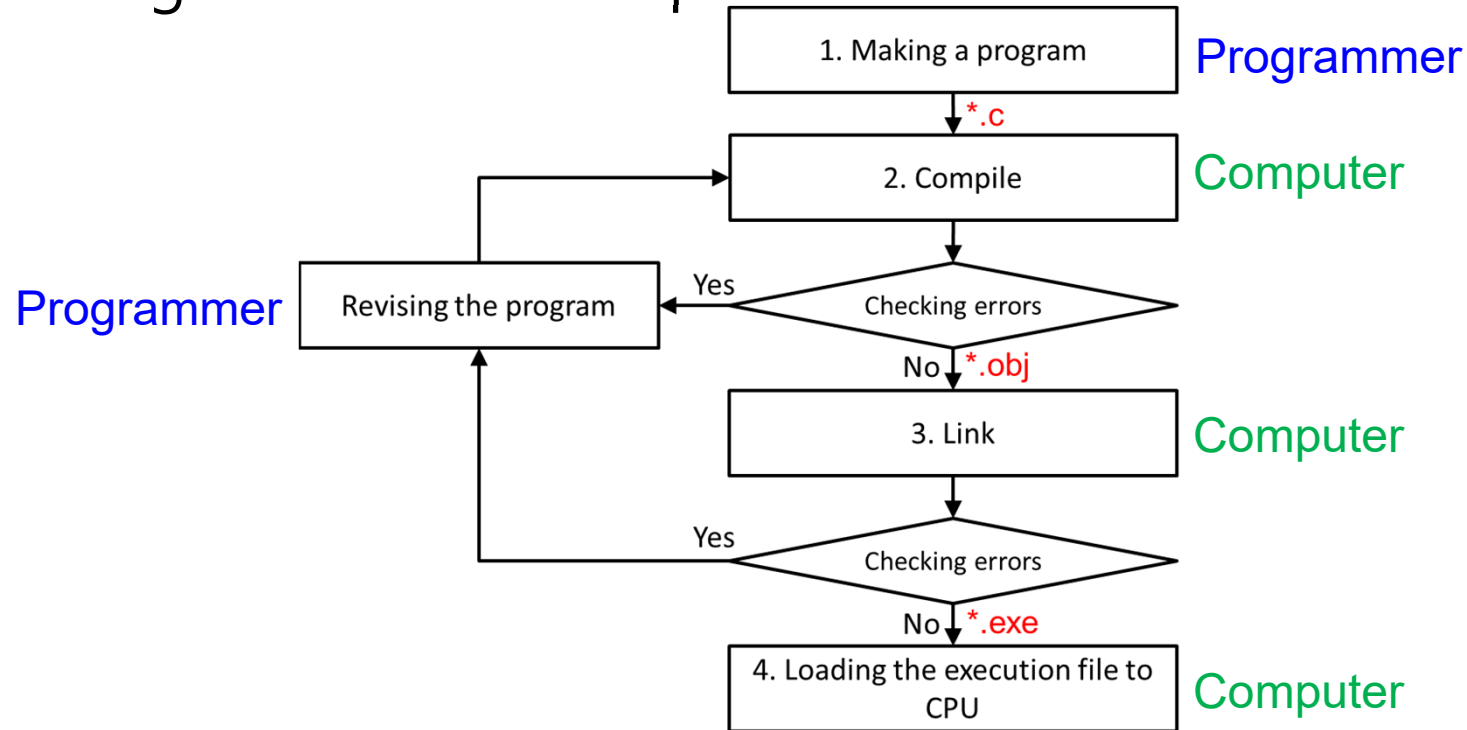
- Finally, The Loader uploads the execution file to CPU (Central Processing Unit is a device that decode and execute instructions).
- Through this process, you can check the results.
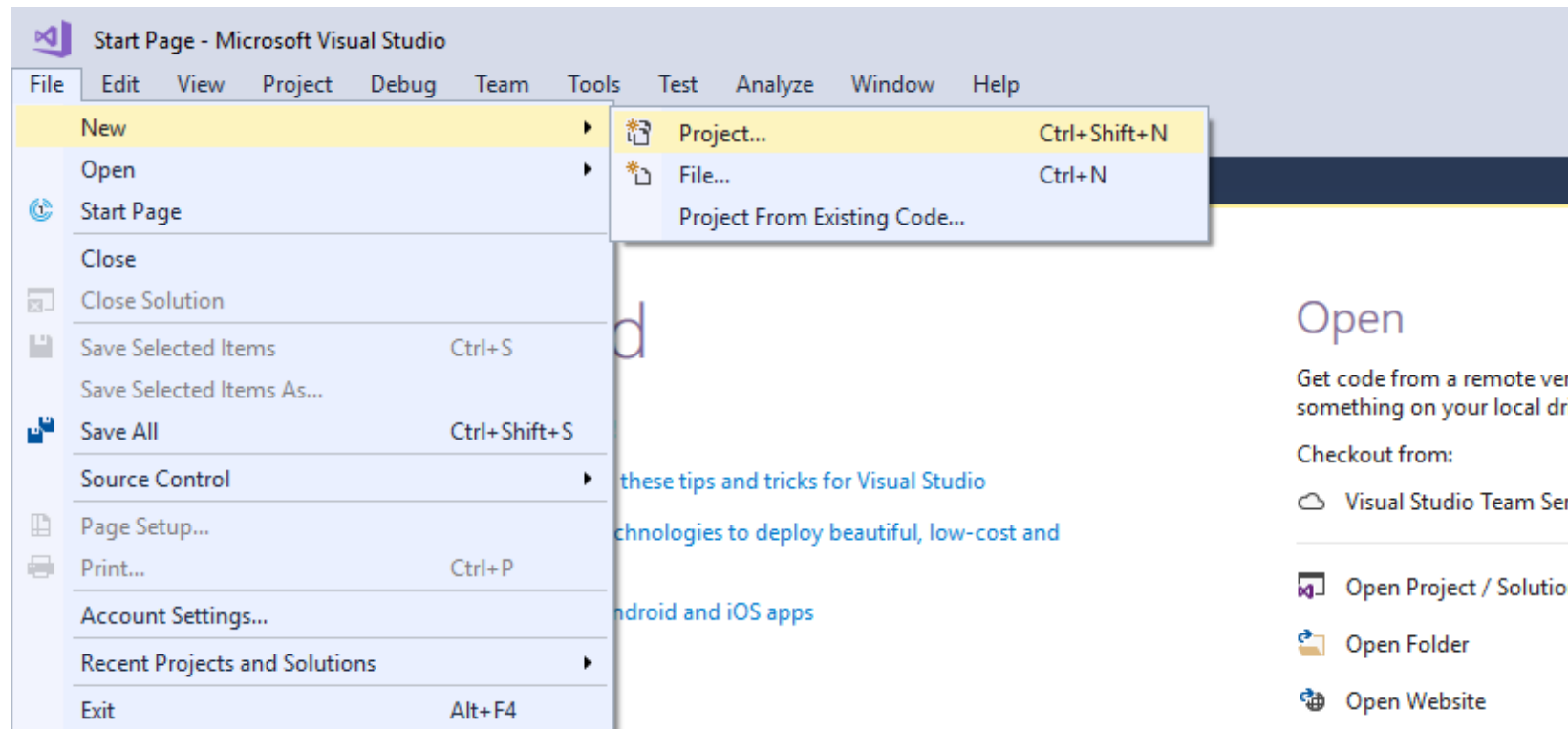
C Programming Process

- Programmer VS Computer

- The programmer makes a program and revises the errors.
- The other works are conducted by the computer.

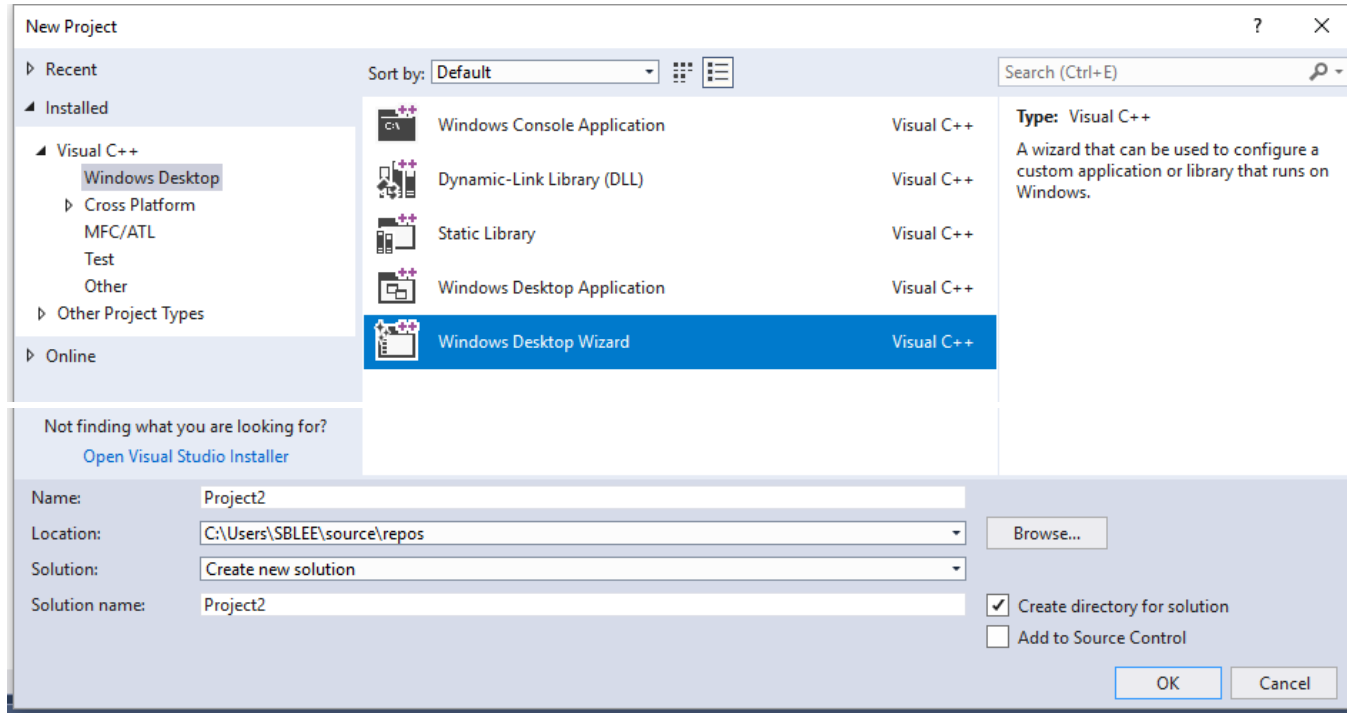# C Program Installation on Windows

- Making a program

- Open the Visual Studio 2019.
- Make the solution and project
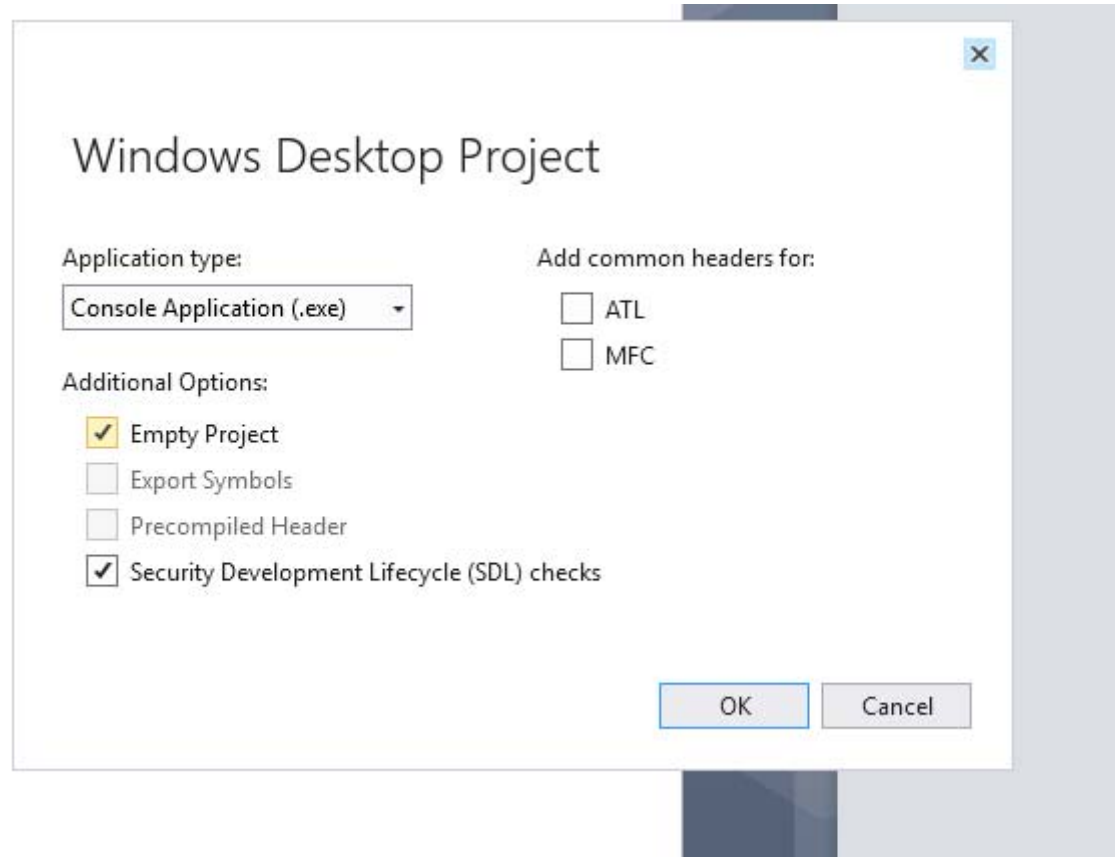
C Program Installation on Windows

- Making a program

- You should choose the "Window Desktop Wizard" in the Visual C++ in VS Community 2017.
- Write the name of the project and select the location.
- Click the OK button.

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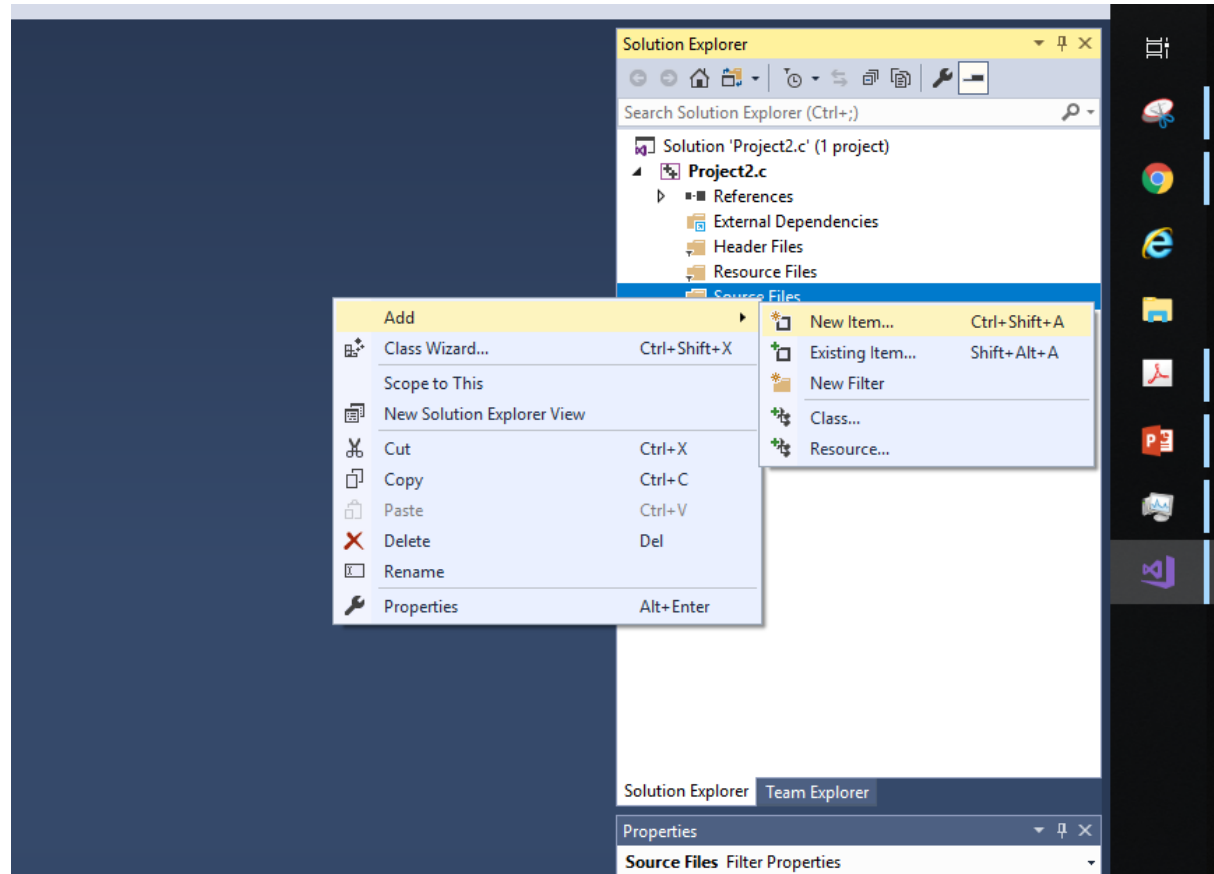JEONBUK NATIONAL UNIV.

C Program Installation on Windows

▪ Making a program

- You should check the empty project.
- Click the OK button.
- The Computer creates the solution and project for C programming.

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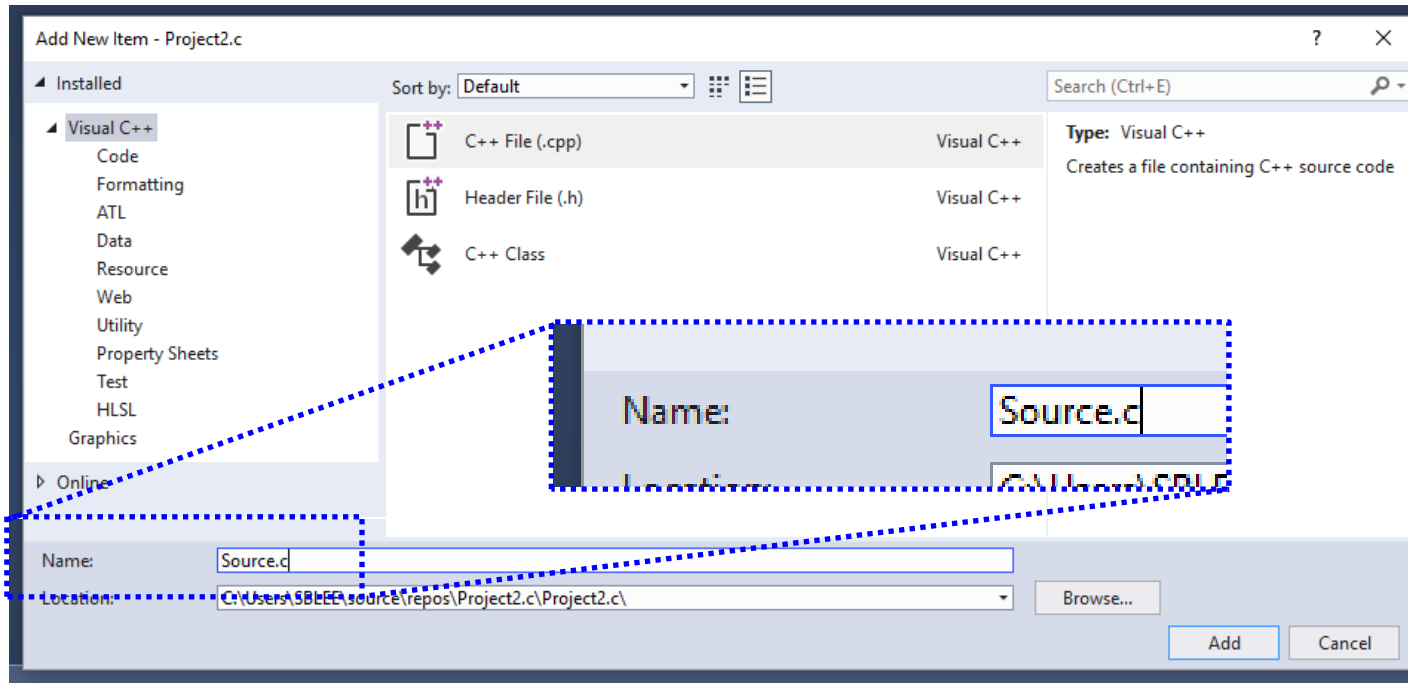
C Program Installation on Windows

- Making a program

- Find the source files in the solution explorer.
- Click the right mouse button on the source files.
- And select the Add and New Item.

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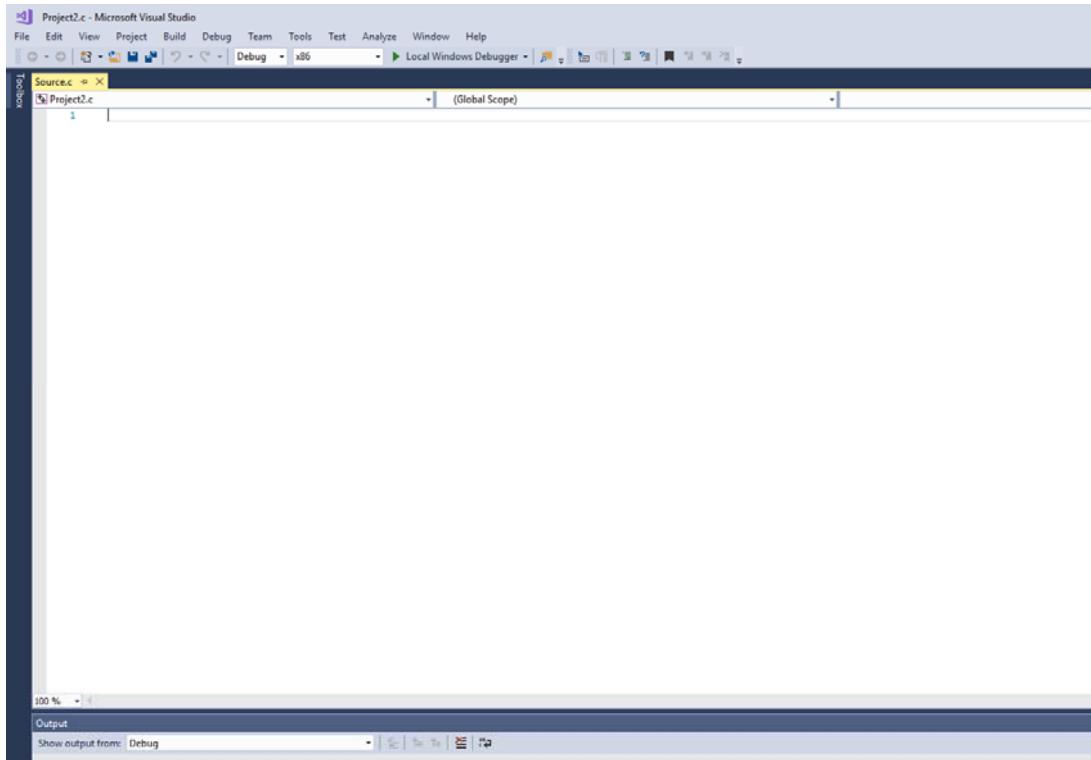# C Program Installation on Windows

- Making a program

- Select the C++ Files.
- Write the Name with extension .c and select the location.
- After finish them, click the Add button.
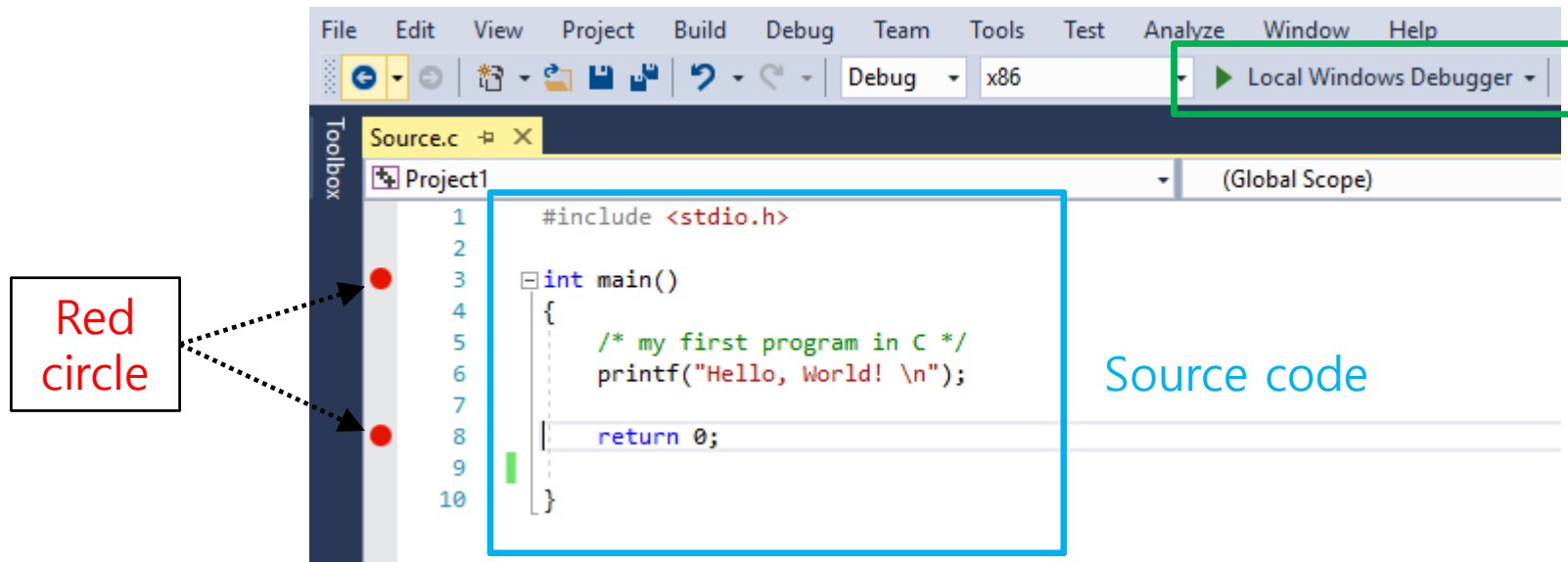
C Program Installation on Windows

- Making a program

- The Windows is changed to write your program.
- Through this process, the basic environment you can make your program is ready.
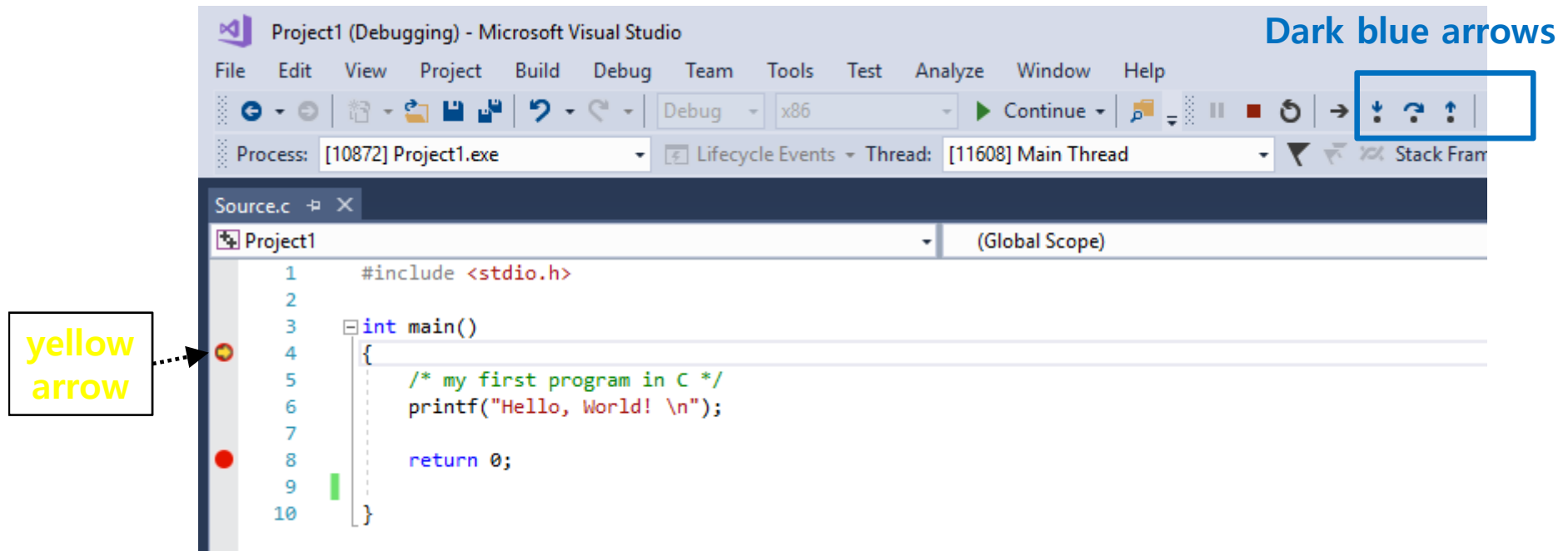
C Program Installation on Windows

- C Hello World Example

Red circle → Source code

- Write the above source code in your source file (or window).
- Click the left mouse button on the gray bar. Then, the red circle will be created on the gray bar.
- And then, click the Local Windows Debugger button in order to execute your program.
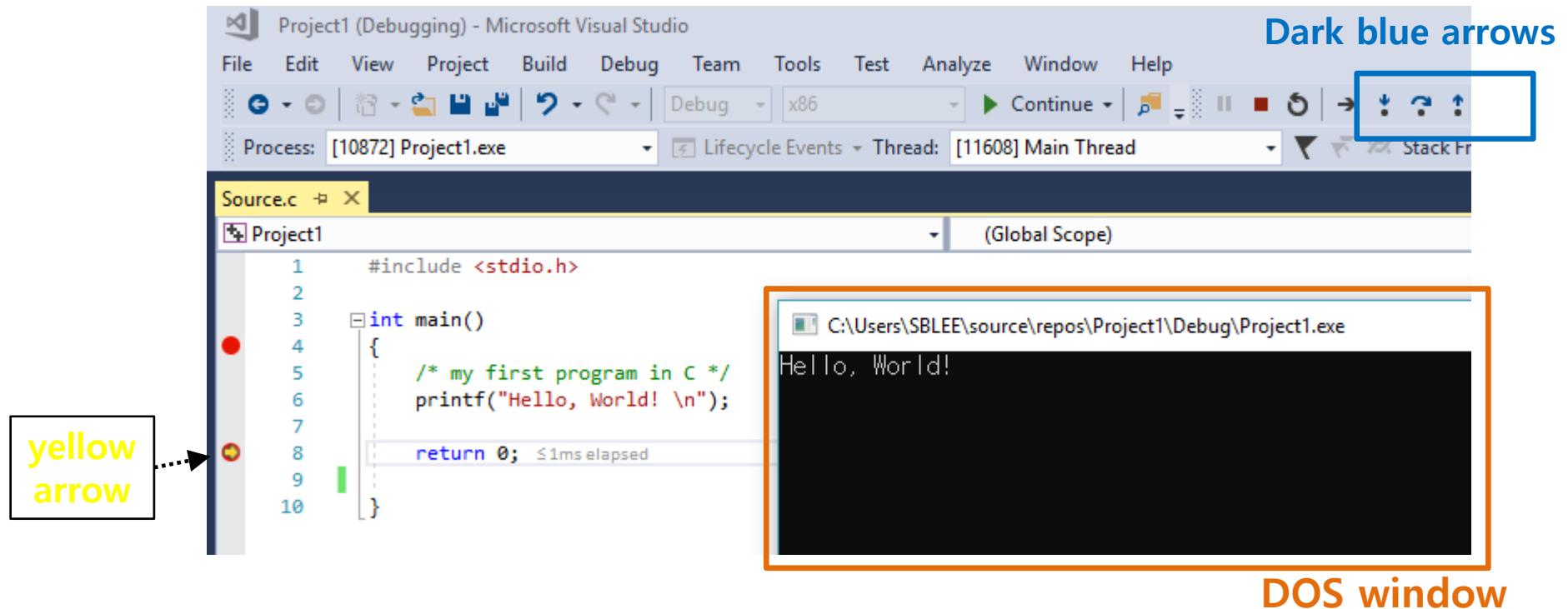
C Program Installation on Windows

- C Hello World Example

- The window is changed like this.
- The yellow arrow indicated that the program is conducted until here (i.e. the compiler decode the code until here).
- The dark blue arrows are used to allow the compiler to move to the next code.

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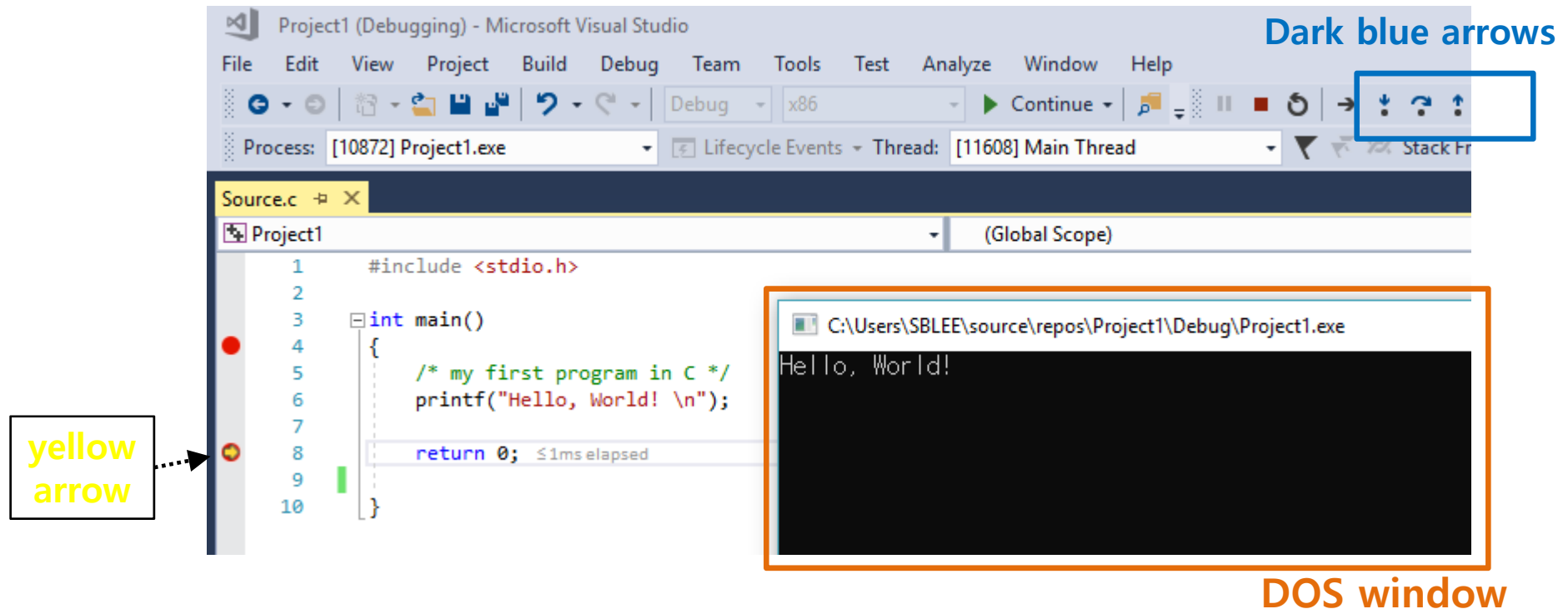JEONBUK NATIONAL UNIV.

C Program Installation on Windows

- C Hello World Example

- If you click the dark blue arrow, the yellow arrow goes down.
- The *printf* function outputs the "Hello world" on the DOS window.
- The output of the phrase "Hello world" on the DOS window is the execution result of this program.

C Program Installation on Windows

- C Hello World Example

- As you click the dark blue arrow, the yellow arrow goes down.
- The **_printf_** function outputs the phrase of "Hello, world!" on the DOS window.
- The output of the phrase of "Hello, world!" on the DOS window is the result of the execution of this program.
- Through this step-by-step process, you can debug and revise your code.

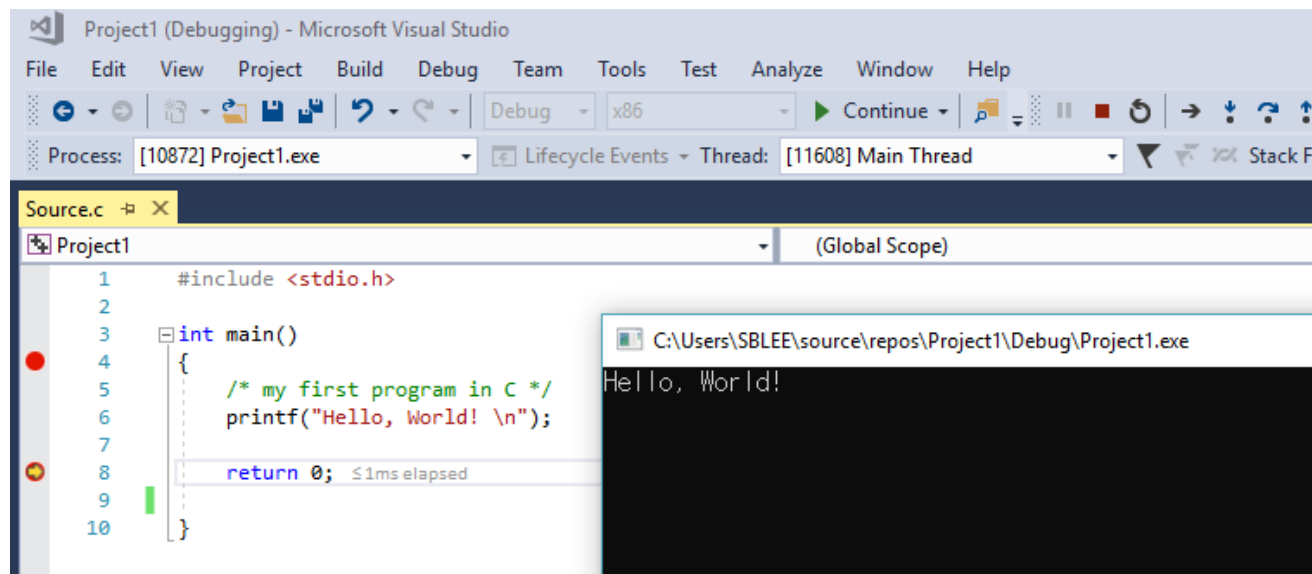# C Program Installation on Windows

- Conclusion

  - We learned the installation method of the Visual Studio Community on Windows.

  - We learned the basic of creating a program and debugging it.

Future works (in Self-coding class)

- Practice

Self-coding class

- Install the Visual Studio Community.

- Review and Practice the contents covered in the lecture class.

- Submit the following images or results, that is the result of the excution of the examples, as your homework.

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Homework guideline

E-mail title: 1st homework in C language class by 2019***** (your student ID)↵

↵

File title: 1st homework in C language class by 2019***** (your student ID)↵

↵

File extension: docx or doc (MS word file)↵

↵

Essential information required in the file (docx):↵

Title↵	1st homework in C language class↵			↵
Student ID (Author)↵	↵	Date↵	↵	↵

↵

Example. ↵

1. Problem definition↵

   A. Explain the solution. ↵

2. Problem definition↵

   A. Explain the solution. ↵

3. Problem definition↵

   A. Explain the solution. ↵

4. Problem definition↵

   A. Explain the solution. ↵

Thank You

(seungbeop.lee@gmail.com)