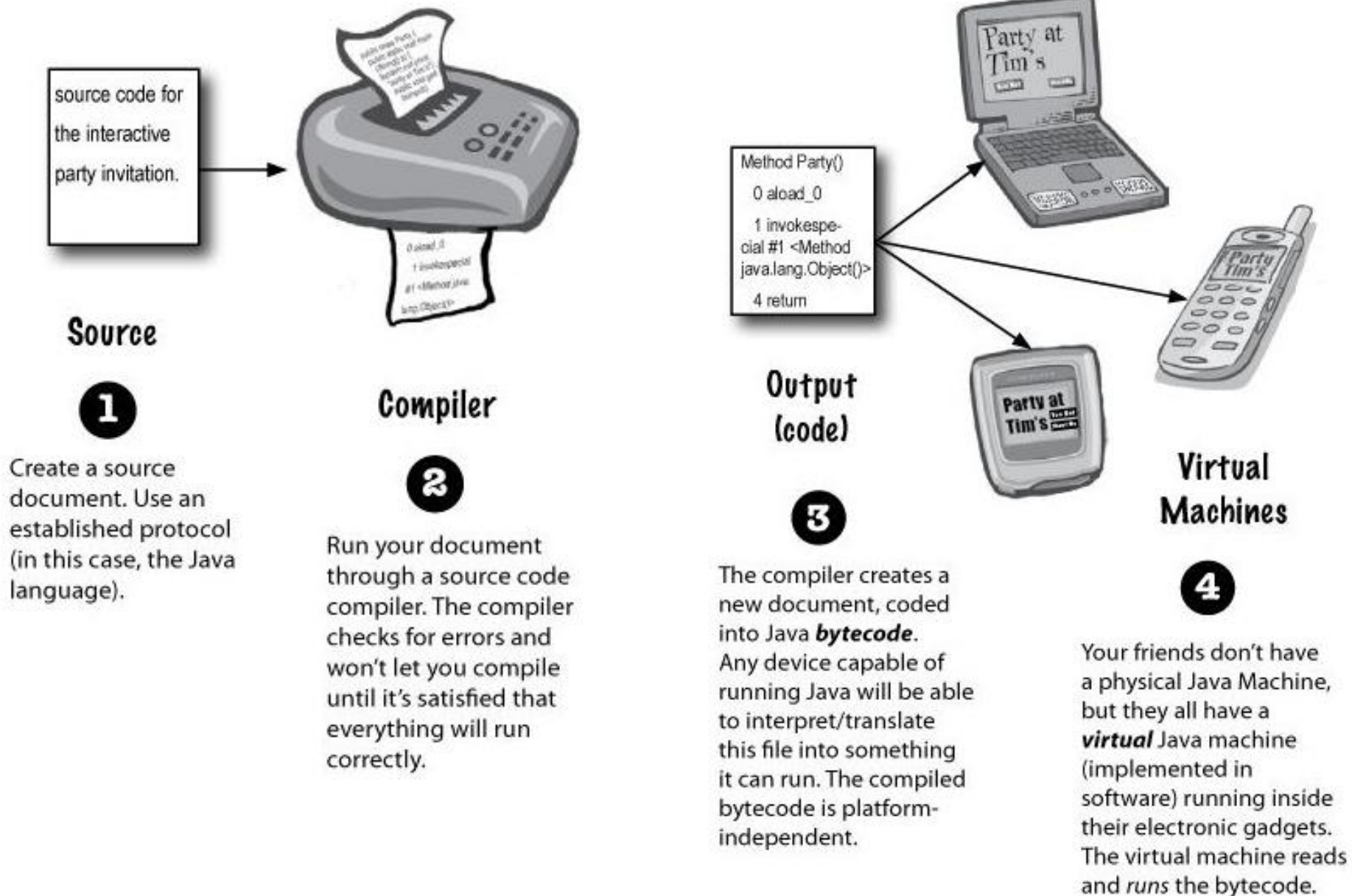


Dive in A Quick Dip: Breaking the Surface

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<http://cyber.hankyong.ac.kr>

The Way Java Works



What you'll do in Java

```
import java.awt.*;
import java.awt.event.*;
class Party {
    public void buildInvite() {
        Frame f = new Frame();
        Label l = new Label("Party at Tim's");
        Button b = new Button("You bet");
        Button c = new Button("Shoot me");
        Panel p = new Panel();
        p.add(l);
    } // more code here...
}
```

Source

1

Type your source code.

Save as: **Party.java**

```
File Edit Window Help Plead
%javac Party.java
```

Compiler

2

Compile the **Party.java** file by running `javac` (the compiler application). If you don't have errors, you'll get a second document named **Party.class**

The compiler-generated **Party.class** file is made up of *bytecodes*.

```
Method Party()
  0 aload_0
  1 invokespecial #1 <Method
    java.lang.Object()>
  4 return
Method void buildInvite()
  0 new #2 <Class java.awt.Frame>
  3 dup
  4 invokespecial #3 <Method
    java.awt.Frame()>
```

Output (code)

3

Compiled code: **Party.class**

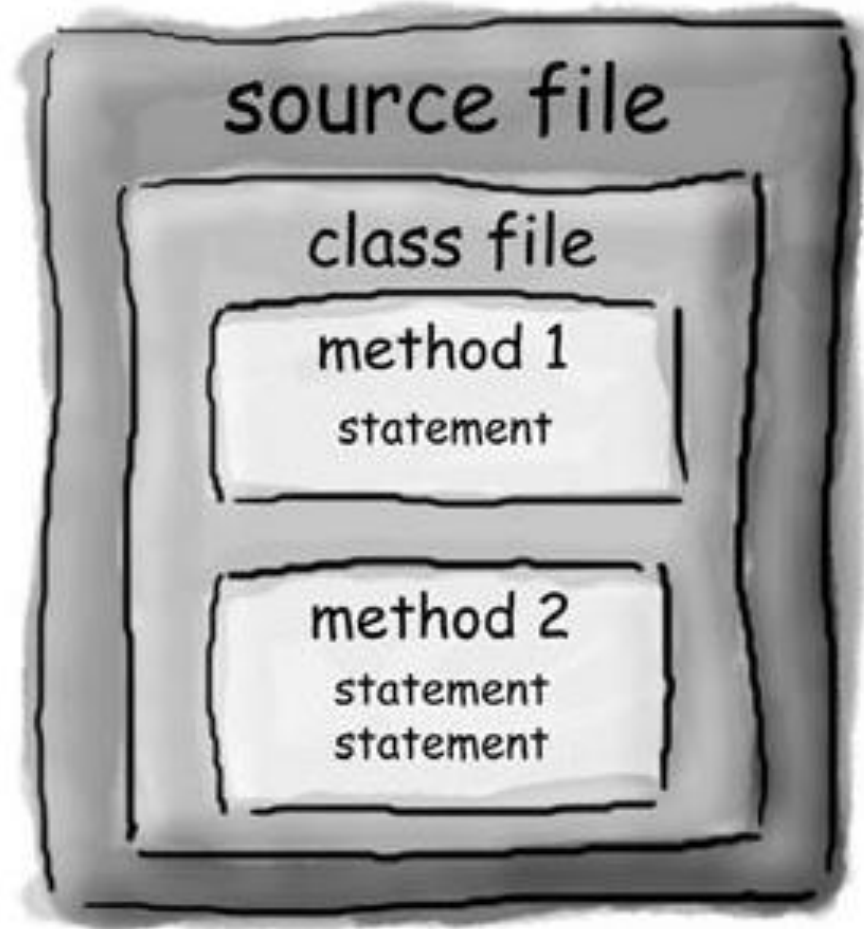


Virtual Machines

4

Run the program by starting the Java Virtual Machine (JVM) with the **Party.class** file. The JVM translates the *bytecode* into something the underlying platform understands, and runs your program.

Code structure in Java



Put a class in a source file.

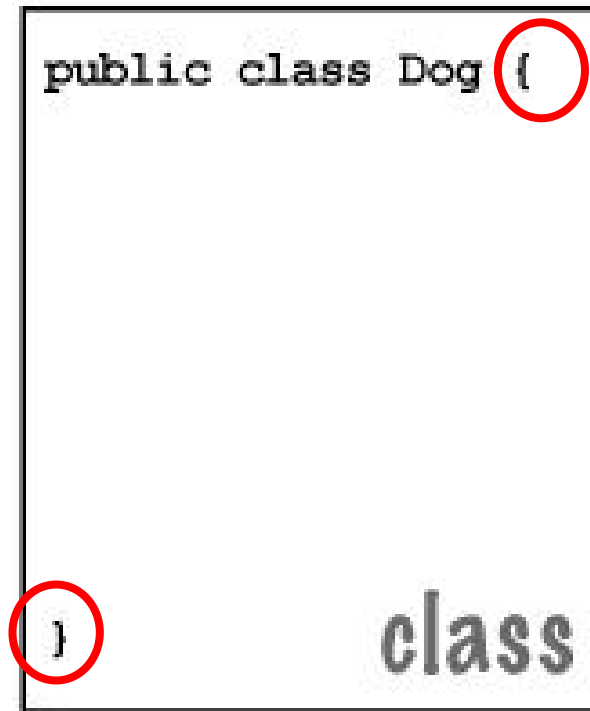
Put methods in a class.

Put statements in a method.

What goes in a source file?

What goes in a source file?

- 소스 코드 파일 (확장자 **.java**) => 클래스 정의를 저장
- 클래스 => 프로그램의 일부분 (단 하나의 클래스만 가지는 프로그램 가능)
- The class must go within a pair of curly braces.



The diagram shows a rectangular box representing a source file. Inside the box, the text `public class Dog {` is at the top, and `}` is at the bottom. Both the opening curly brace `{` and the closing curly brace `}` are circled in red. The word `class` is written in a larger, gray font at the bottom right of the box.

What goes in a class?

- 클래스 => 하나 이상의 메소드를 가진다
- **Dog** 클래스에서 **bark()** 메소드 => **Dog**가 어떻게 짖는가에 대한 명령문을 포함하게 된다
- 모든 메소드는 클래스 내부에 선언되어야 한다

```
public class Dog {  
    void bark() {  
  
    }  
}
```

method

What goes in a method?

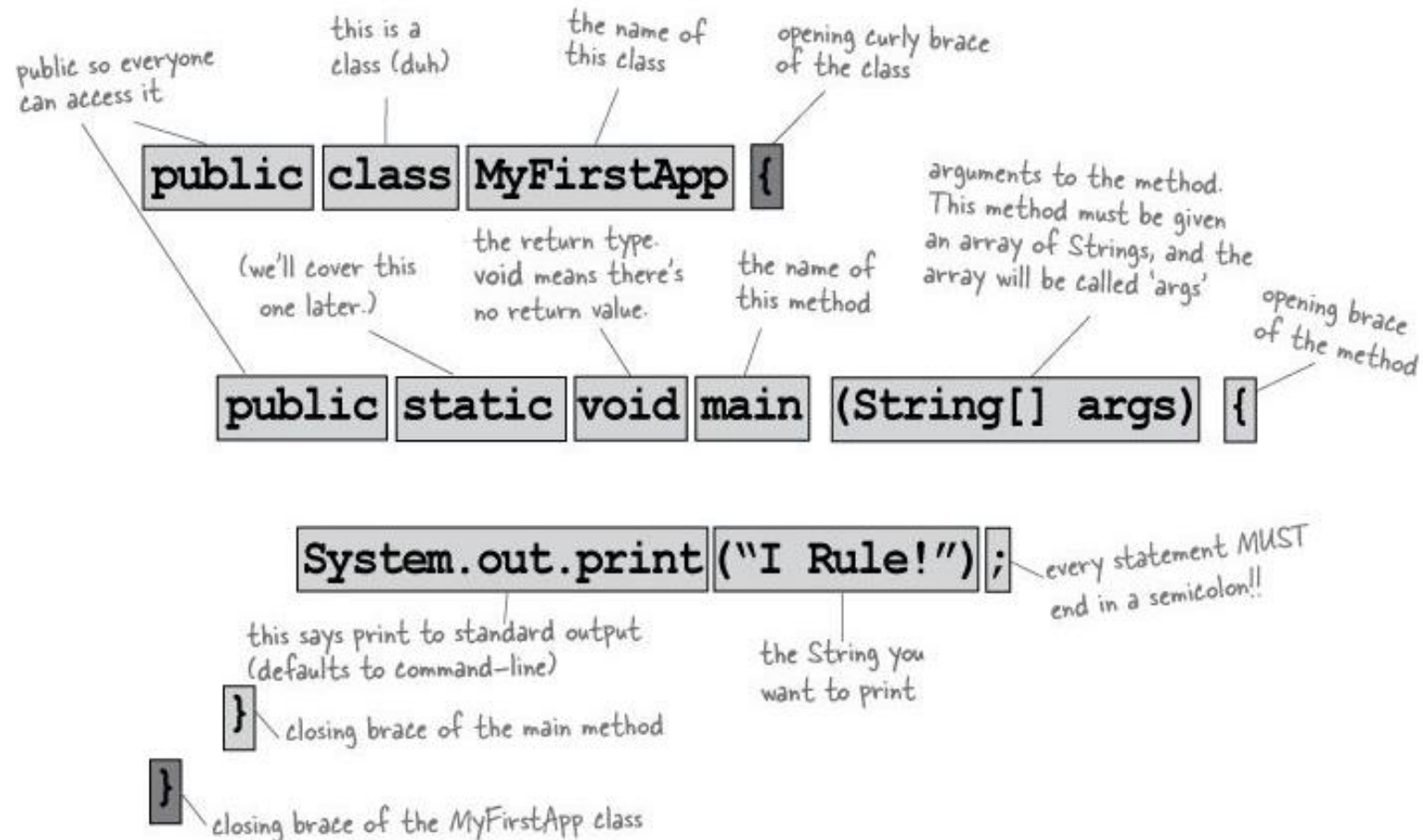
- 메소드의 중괄호(curly braces) 내에서 그 메소드가 어떻게 수행되어야 하는 가에 대한 명령문 작성
- 메소드 코드 => 기본적으로 함수 또는 프로시저와 같은 문장들의 집합

```
public class Dog {  
    void bark() {  
        statement1;  
        statement2;  
    }  
}
```

statements

Anatomy of a class

- **JVM** => 메소드의 중괄호 { } 사이에 있는 모든 것을 실행
- 모든 자바 애플리케이션 => 적어도 하나의 클래스와 하나의 **main()** 메소드를 포함해야



Writing a class with a main

How do I write Java code so that it will run? And it all begins with `main()`.



```
public class MyFirstApp {  
  
    public static void main (String[] args) {  
        System.out.println("I Rule!");  
        System.out.println("The World");  
    }  
}
```

1 Save

`MyFirstApp.java`

2 Compile

`javac MyFirstApp.java`

3 Run

```
File Edit Window Help Screen  
  
%java MyFirstApp  
  
I Rule!  
  
The World
```

What can you say in the main method?

컴퓨터가 무언가를 하도록 하기 위해 대부분의 프로그래밍 언어에서 말하는 모든 일반적인 것을 말할 수 있다.

코드에서 **JVM**에게 다음과 같이 말할 수 있다:



1. do something

Statements: declarations, assignments, method calls, etc.

```
int x = 3;
String name = "Dirk";
x = x * 17;
System.out.print(" x is " + x);
double d = Math.random();
// this is a comment
```

2. do something again and again

Loops: for and while

```
while (x > 12) {
    x = x - 1;
}
for (int x = 0; x < 10; x = x + 1) {
    System.out.print(" x is now " + x);
}
```

3. Do something under this condition

Branching: if/else tests

```
if (x == 10) {  
    System.out.print("x must be 10");  
} else {  
    System.out.print("x isn't 10");  
}  
  
if (( x < 3) & (name.equals("Dirk"))) {  
    System.out.println("Gently");  
}  
  
System.out.print("this line runs no matter what");
```

Looping and looping and...



```
while (moreBalls == true) {  
    keepJuggling();  
}
```

Java에는 **while**, **do-while** 및 **for**의 세 가지 표준 루핑 구문이 있다.

루프의 핵심은 **조건 테스트**이다.

Java에서 조건부 테스트는 결과가 부울 값, 즉 진실 또는 거짓인 결과이다.

Simple boolean tests

아래와 같은 비교 연산자를 사용하여 변수의 값을 검사하여 간단한 부울 테스트를 수행할 수 있다.

< (less than)

> (greater than)

== (equality) (yes, that's two equals signs)

대입 연산자(단일 등호)와 ***equals*** 연산자(두 개의 등호) 간의 차이점에 주목하자.

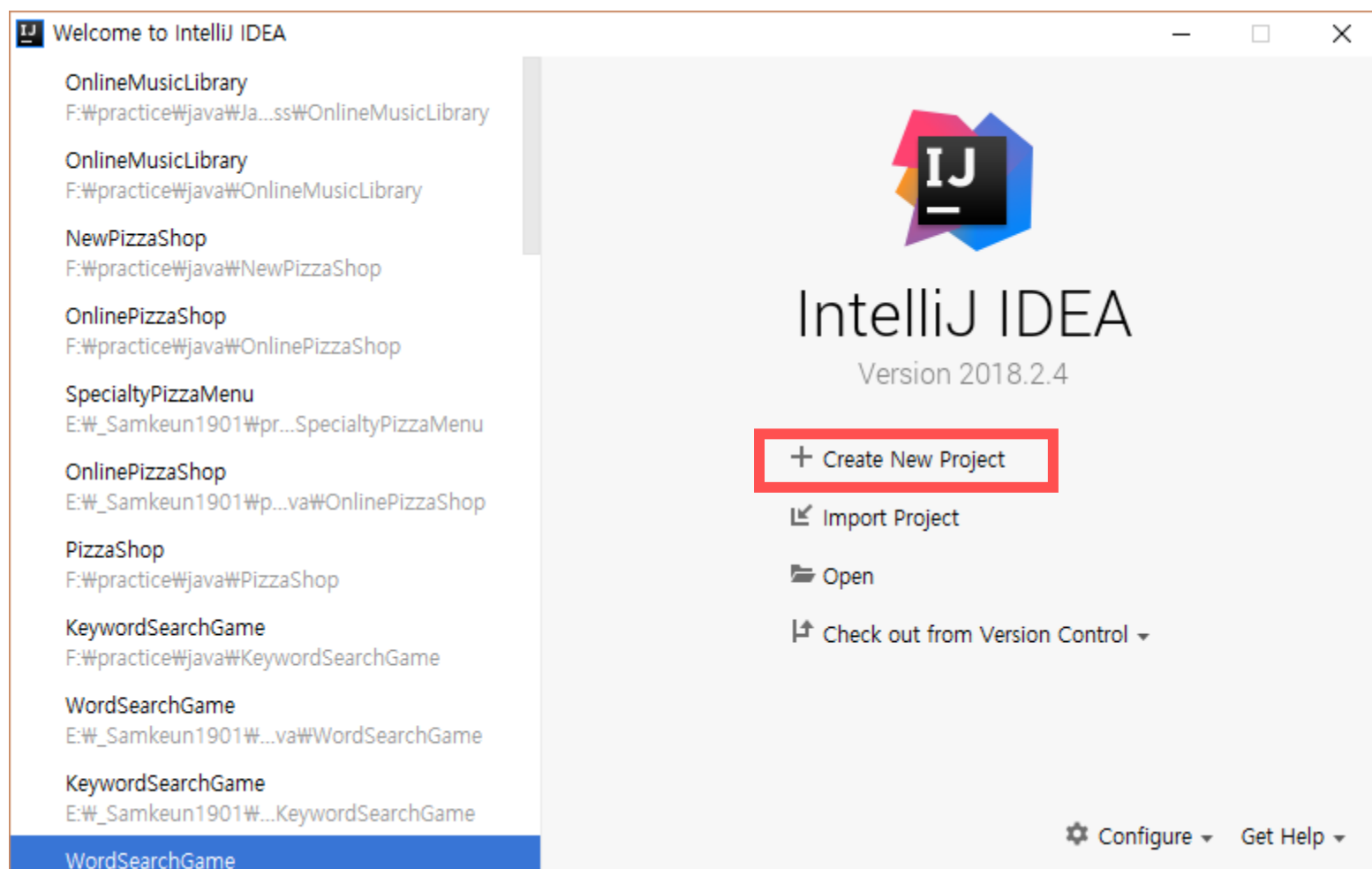
```
int x = 4; // assign 4 to x
while (x > 3) {
    // loop code will run because
    // x is greater than 3
    x = x - 1; // or we'd loop forever
}
int z = 27; //
while (z == 17) {
    // loop code will not run because
    // z is not equal to 17
}
```

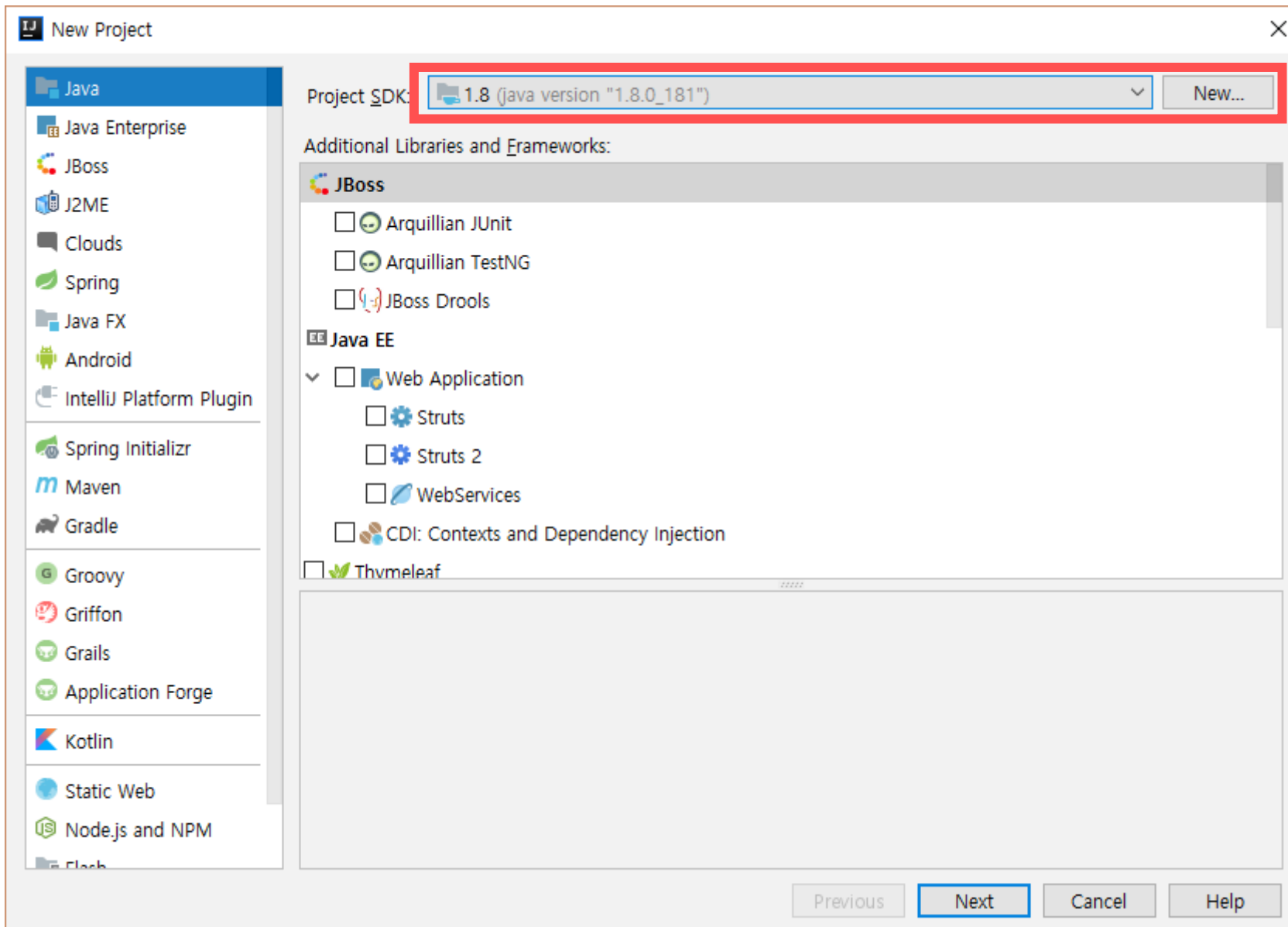
실습과제 1-1 Looping and looping and...

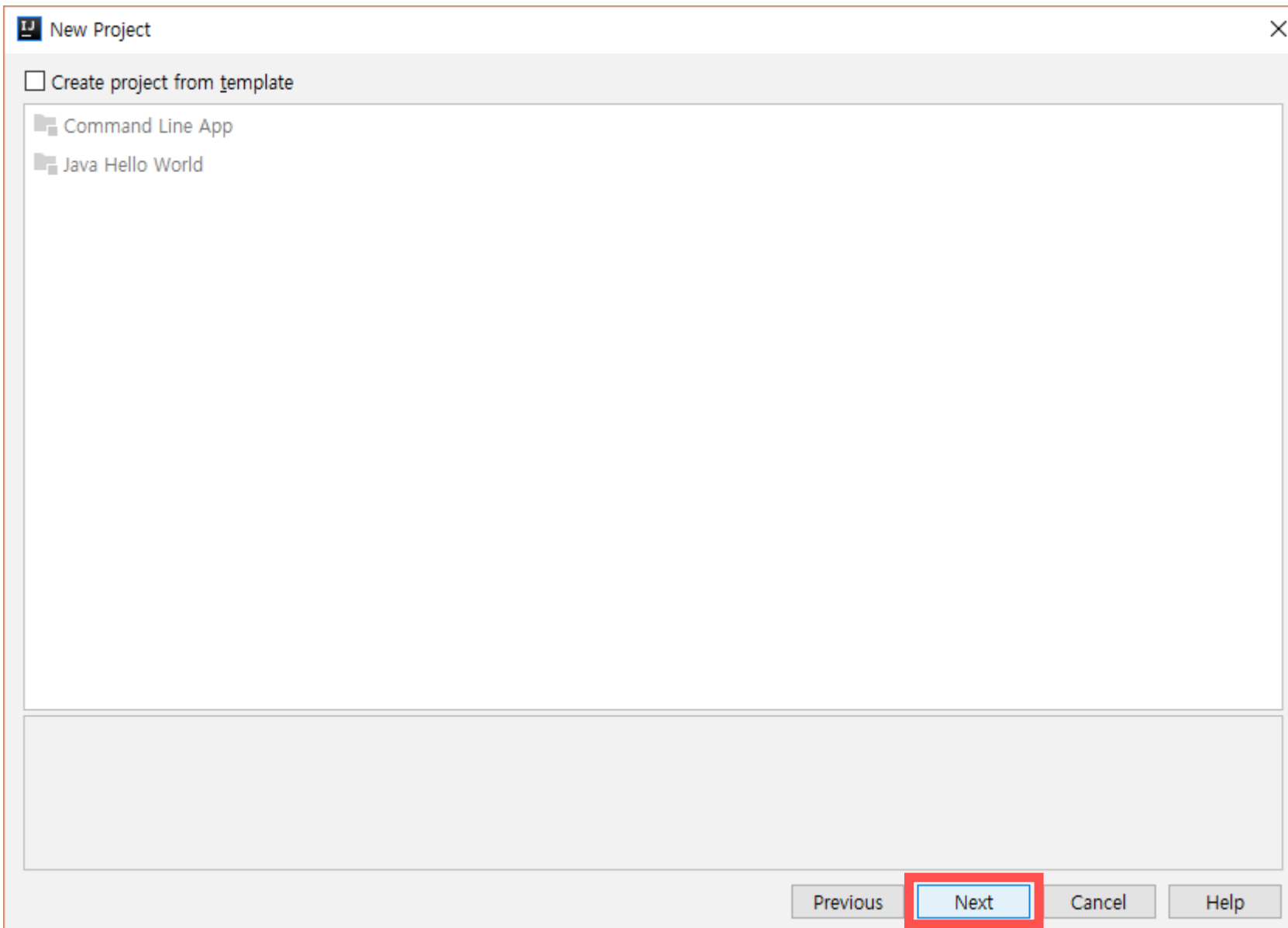
Example of a while loop


클래스명(Loopy)과 정확히 일치하는 파일명
(Loopy.java)으로 저장해야 한다. (대소문자 구분함)

```
public class Loopy {  
    public static void main (String[] args) {  
        int x = 1;  
        System.out.println("Before the Loop");  
        while (x < 4) {  
            System.out.println("In the loop");  
            System.out.println("Value of x is " + x);  
            x = x + 1;  
        }  
        System.out.println("This is after the loop");  
    }  
}
```







 New Project ✕

Project name:

Project location: ...

▼ More Settings

Module name:

Content root: 📁

Module file location: 📁

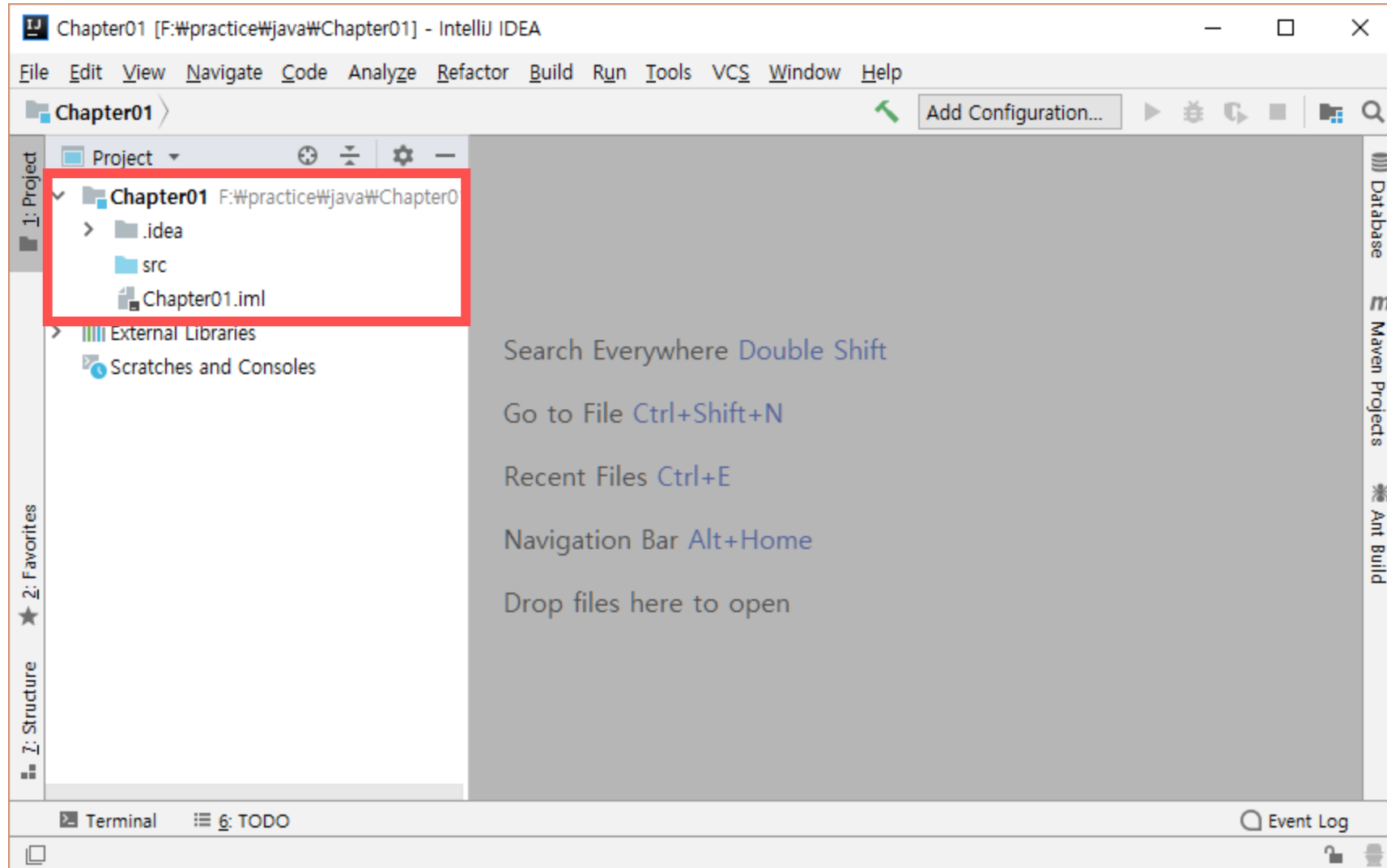
Project format: ▼

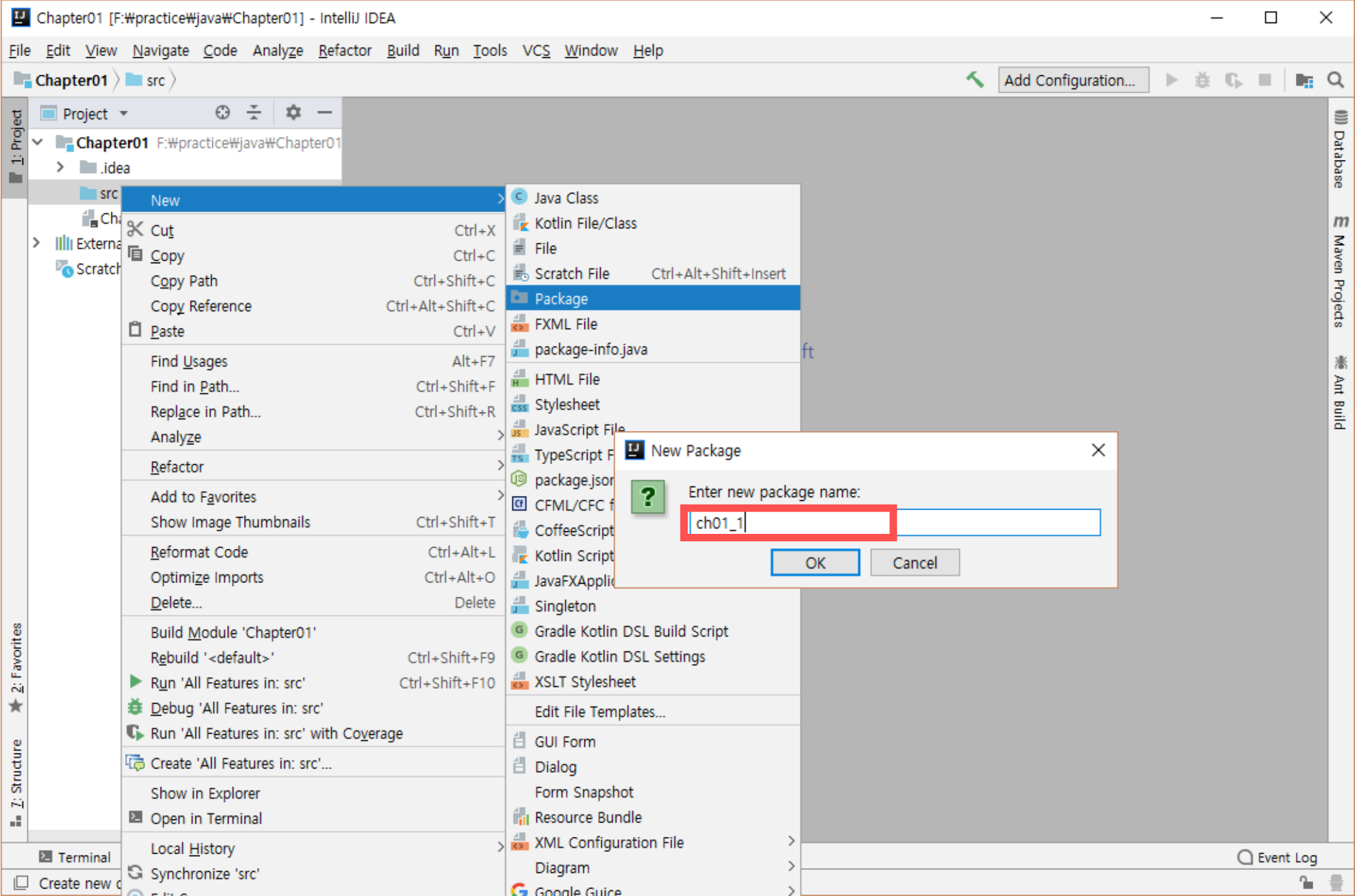
Previous

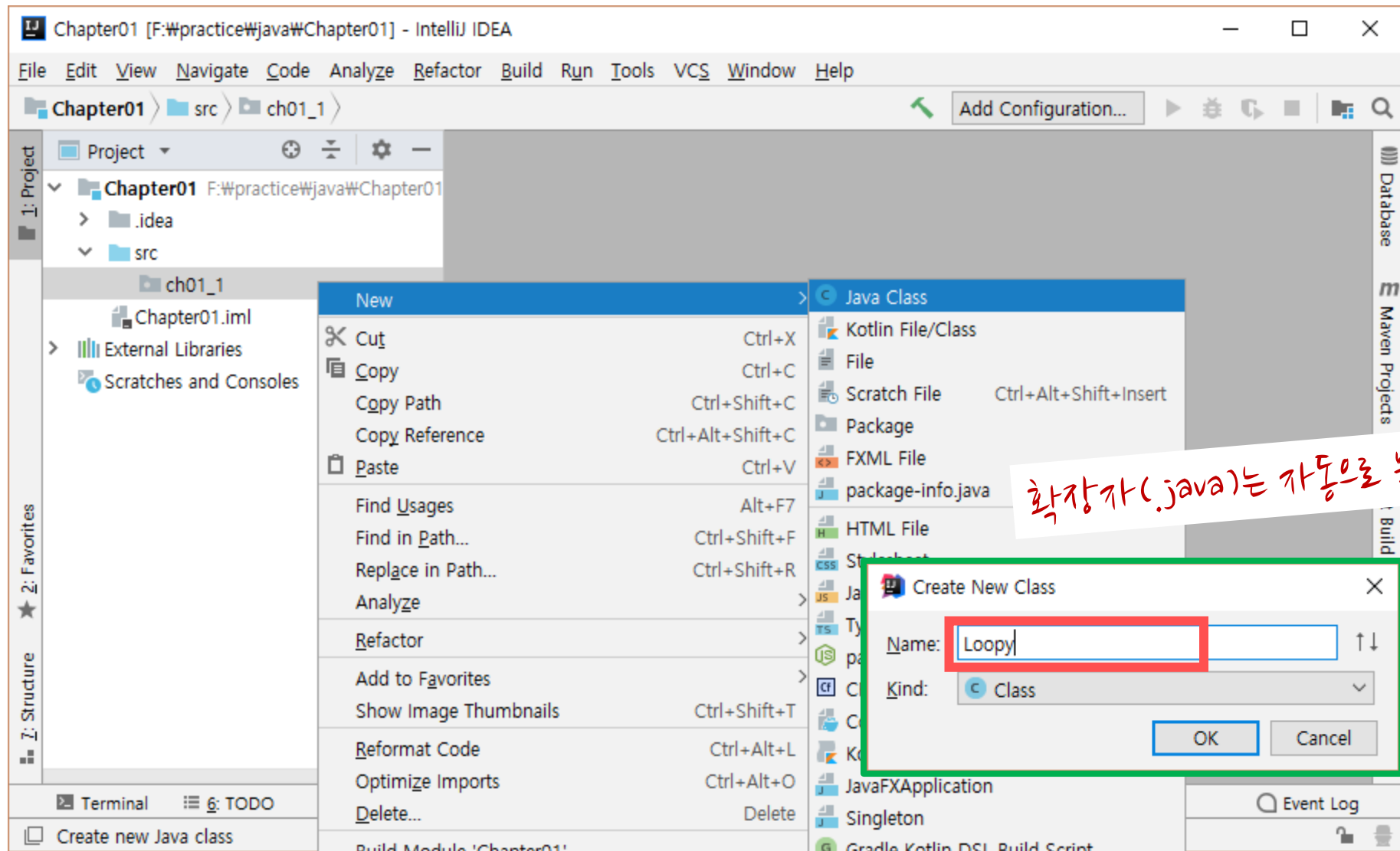
Finish

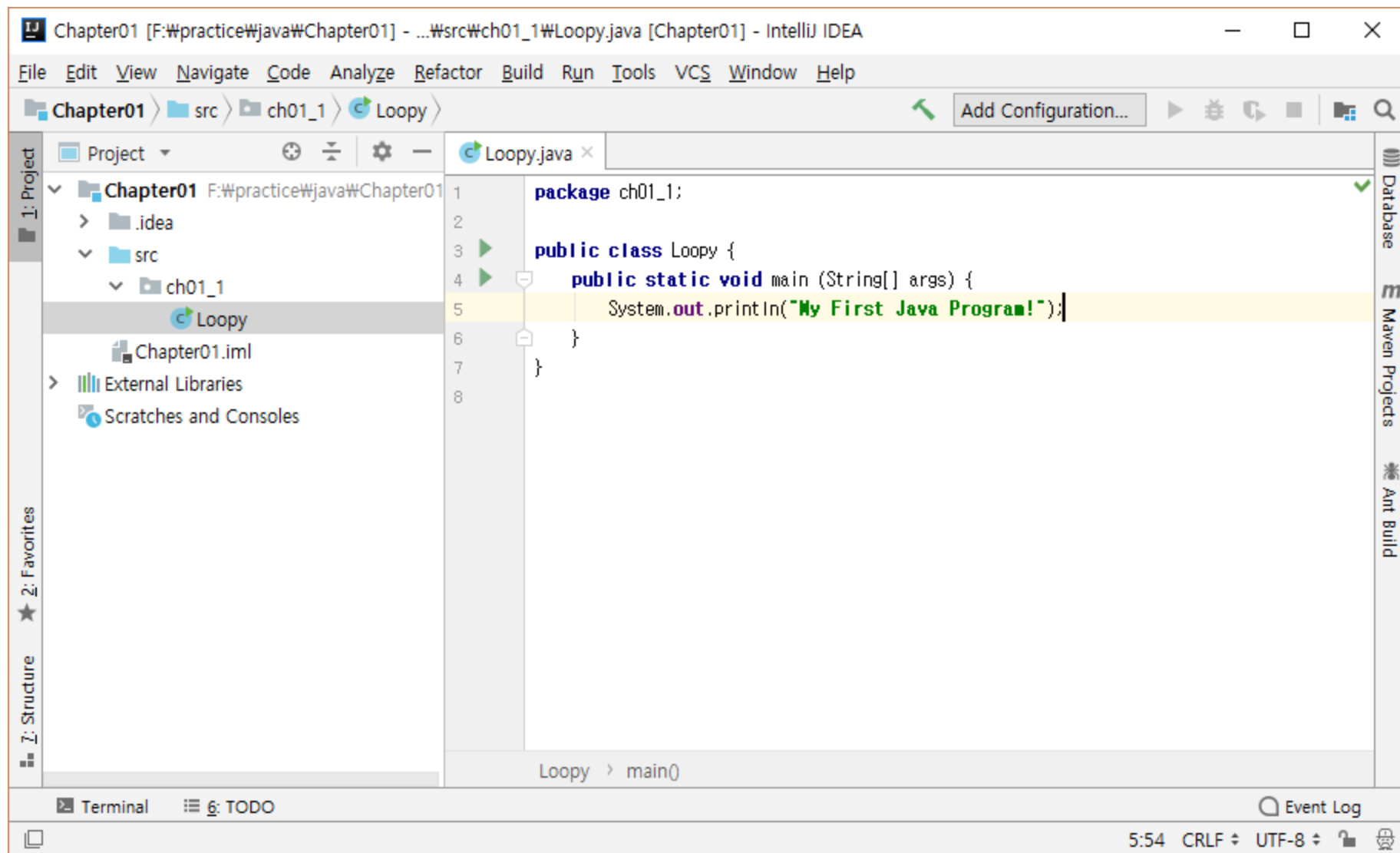
Cancel

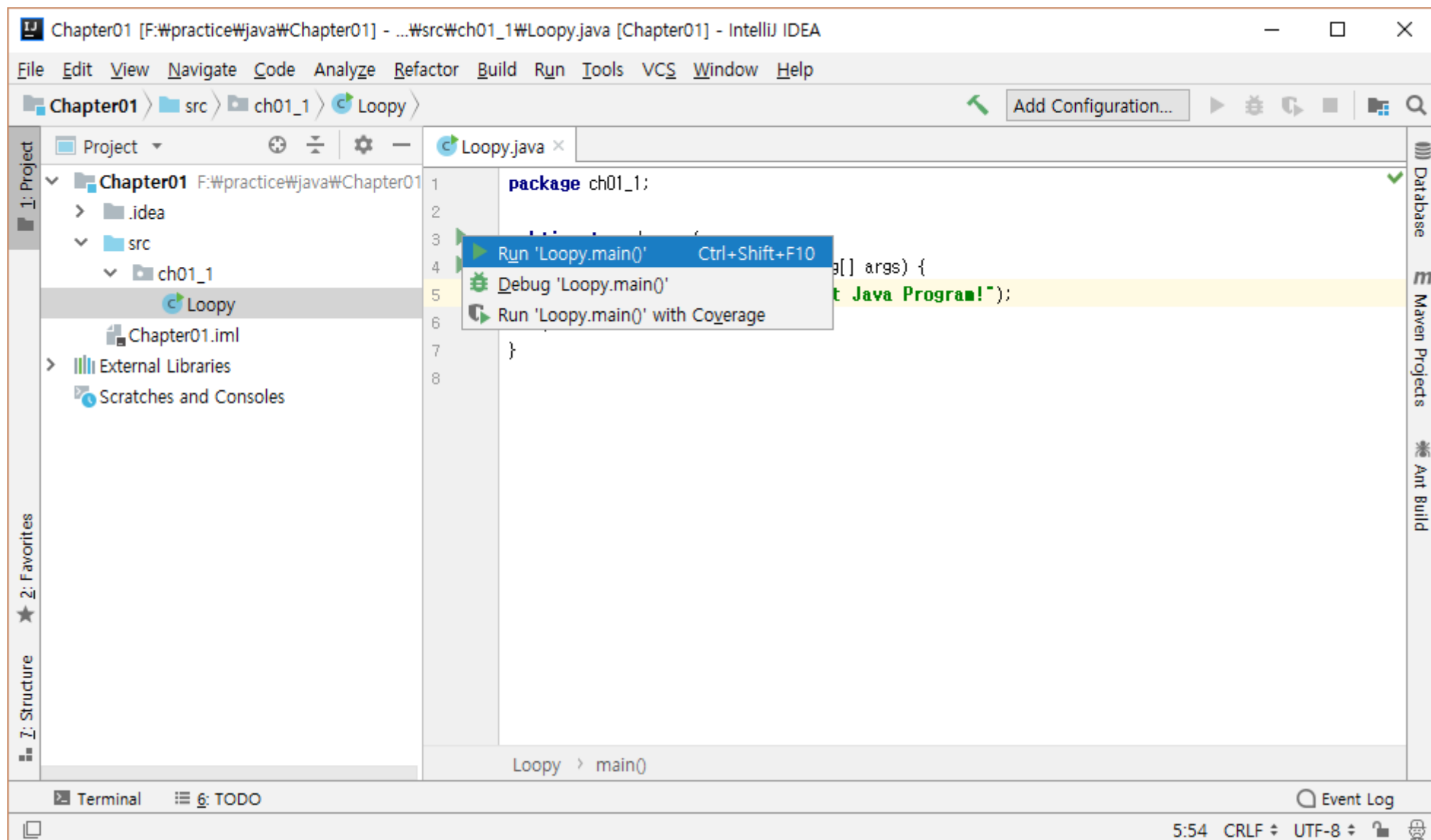
Help

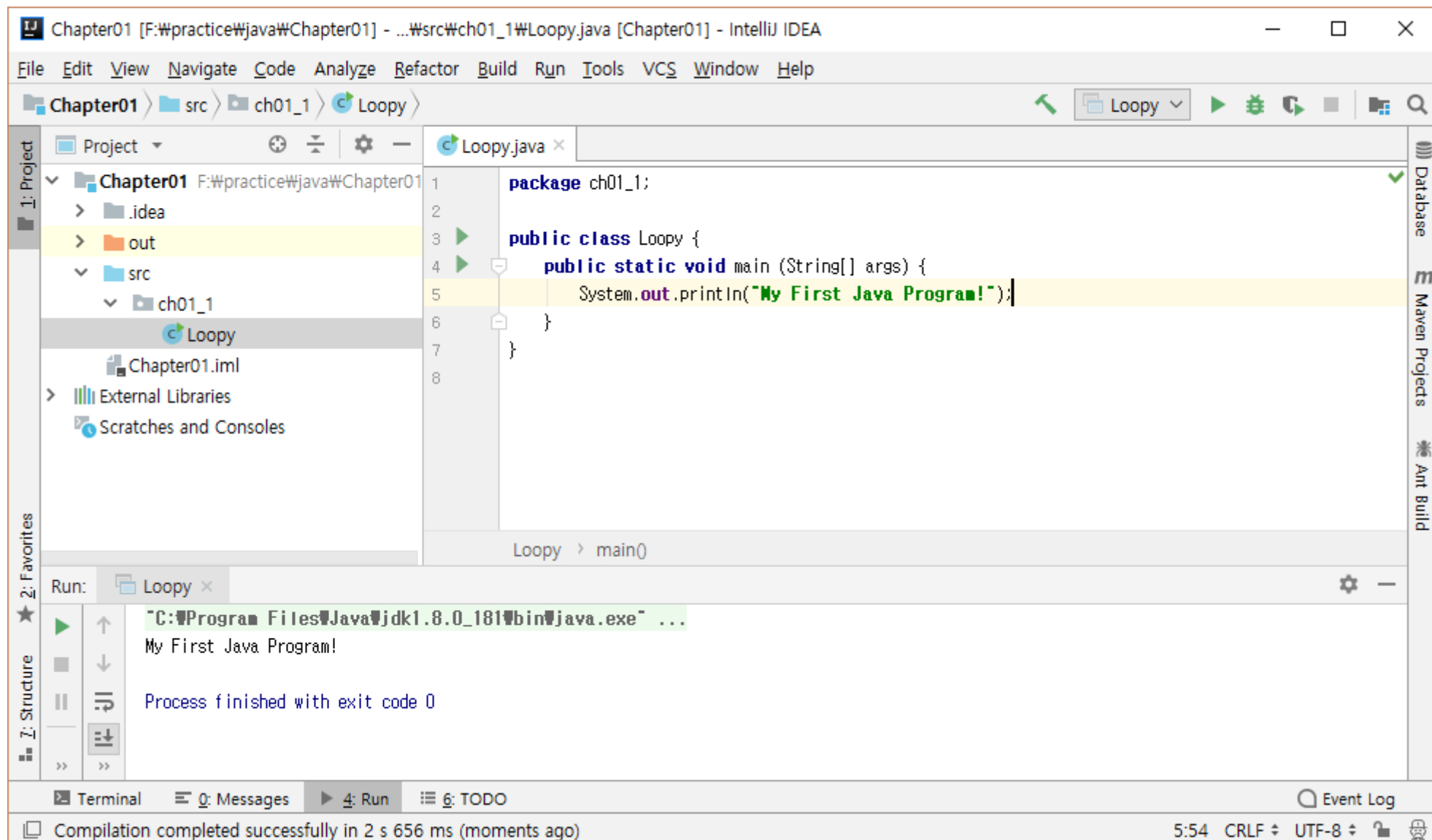


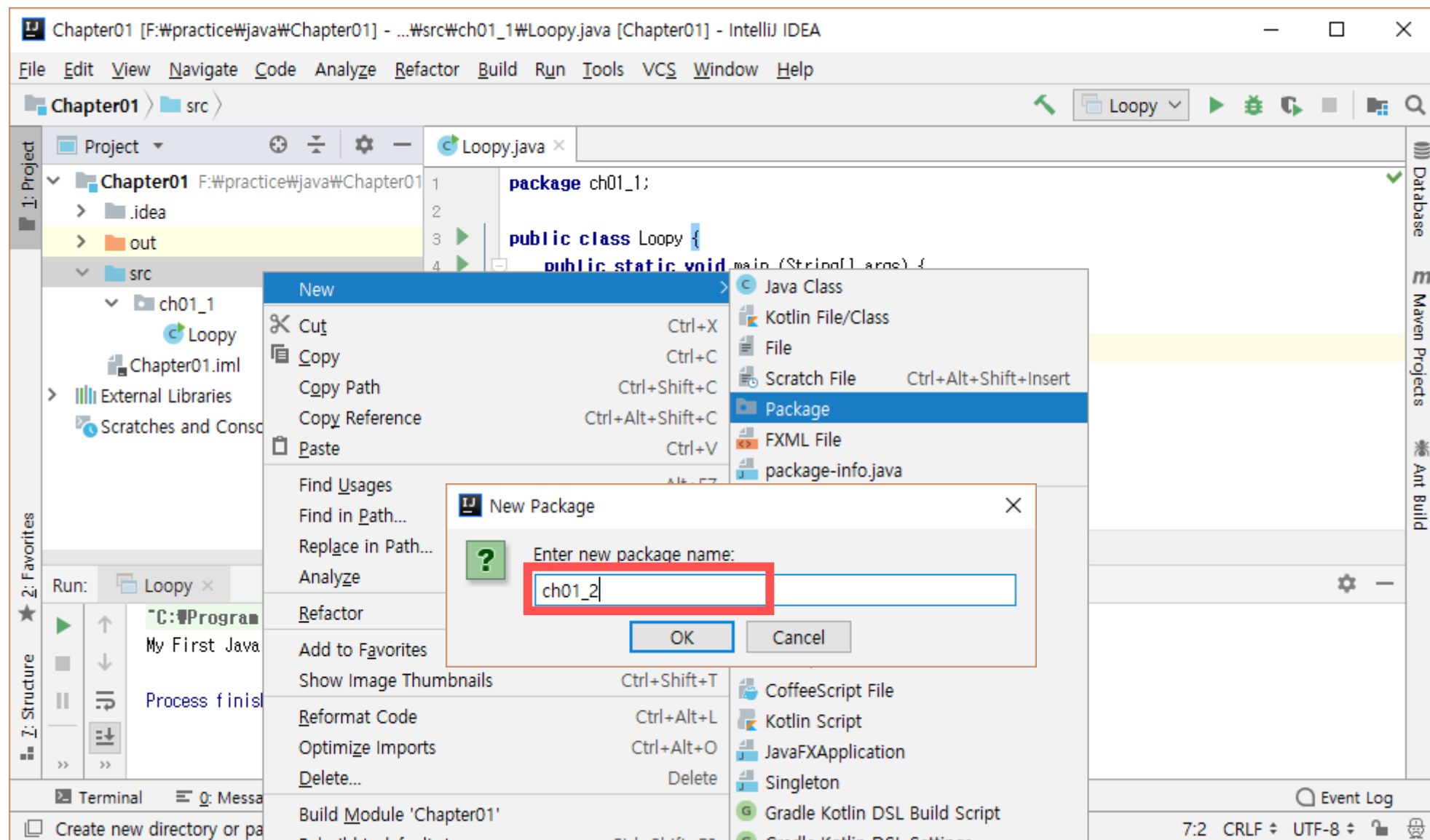


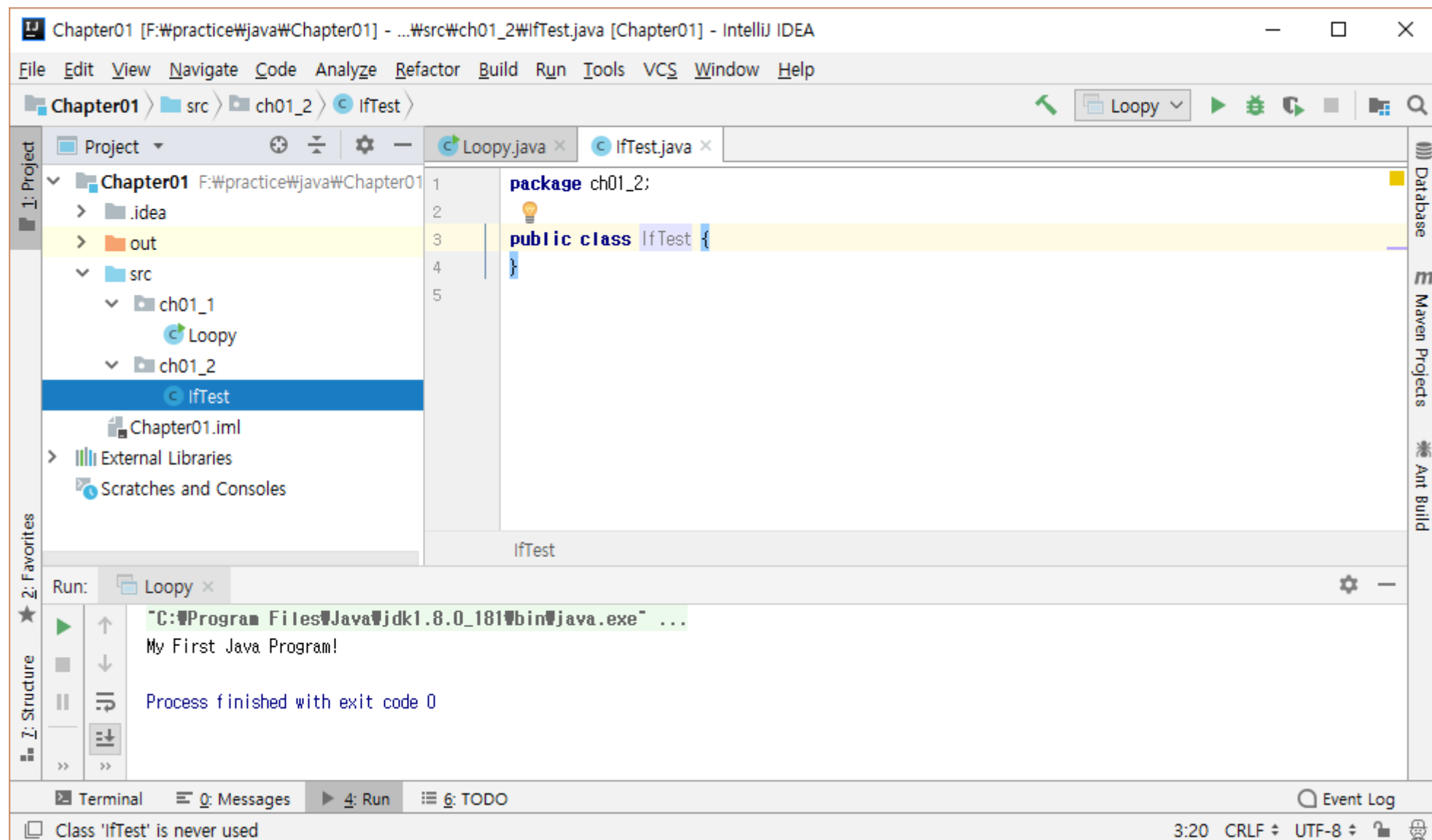












실습과제 1-2 Conditional branching

```
1) class IfTest {  
    public static void main (String[] args) {  
        int x = 3;  
        if (x == 3) {  
            System.out.println("x must be 3");  
        }  
        System.out.println("This runs no matter what");  
    }  
}
```

```
2) class IfTest2 {  
    public static void main (String[] args) {  
        int x = 2;  
        if (x == 3) {  
            System.out.println("x must be 3");  
        } else {  
            System.out.println("x is NOT 3");  
        }  
        System.out.println("This runs no matter what");  
    }  
}
```

Coding a Serious Business Application

Before you look at the code on this page, think for a moment about how you would code that classic children's favorite, **"99 bottles of beer."**

```
public class BeerSong {
    public static void main (String[] args) {
        int beerNum = 99;
        String word = "bottles";

        while (beerNum > 0) {

            if (beerNum == 1) {
                word = "bottle"; // singular, as in ONE bottle.
            }

            System.out.println(beerNum + " " + word + " of beer on the wall");
            System.out.println(beerNum + " " + word + " of beer.");
            System.out.println("Take one down.");
            System.out.println("Pass it around.");
            beerNum = beerNum - 1;

            if (beerNum > 0) {
                System.out.println(beerNum + " " + word + " of beer on the wall");
            } else {
                System.out.println("No more bottles of beer on the wall");
            } // end else
        } // end while loop
    } // end main method
} // end class
```



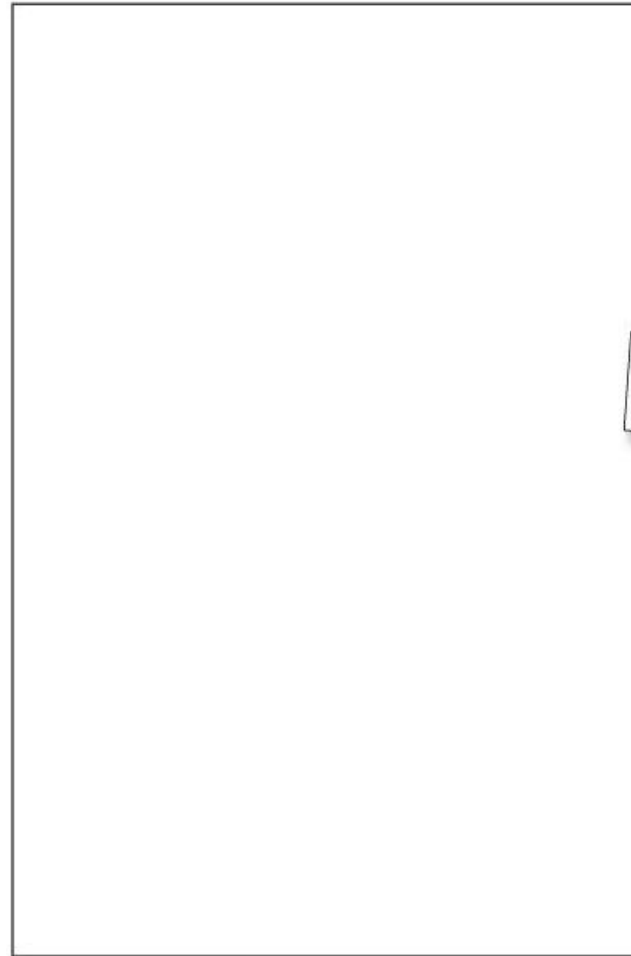
실습과제 1-3 Coding a Serious Business Application

BeerSong 구현하기

+

There's still one little flaw in our code. It compiles and runs, but the output isn't 100% perfect. See if you can spot the flaw, and fix it.

실습과제 1-4 Code Magnets



```
if (x == 1) {  
    System.out.print("d");  
    x = x - 1;  
}
```

```
if (x == 2) {  
    System.out.print("b c");  
}
```

```
class Shuffle1 {  
    public static void main(String [] args) {
```

```
        if (x > 2) {  
            System.out.print("a");  
        }
```

```
        int x = 3;
```

```
        x = x - 1;  
        System.out.print("-");
```

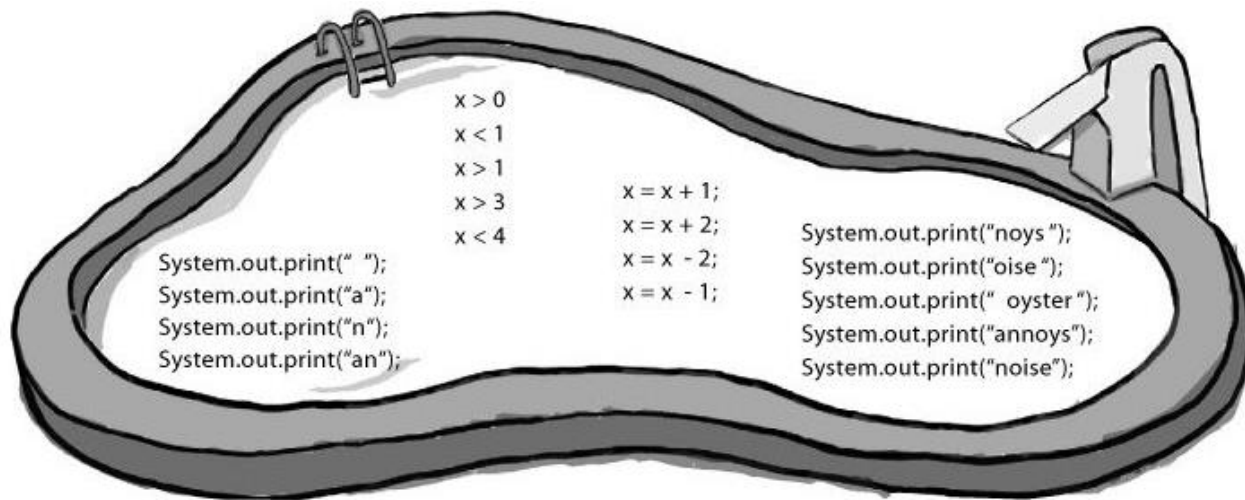
```
        while (x > 0) {
```

Output:

```
File Edit Window Help Sleep  
% java Shuffle1  
a-b c-d
```


실습과제 1-5 Pool Puzzle

```
File Edit Window Help Cheat
%java PoolPuzzleOne
a noise
annoys
an oyster
```



Note: Each snippet from the pool can be used only once!

```
class PoolPuzzleOne {
    public static void main(String [] args) {
        int x = 0;

        while ( _____ ) {

            _____
            if ( x < 1 ) {
                _____
            }

            _____
            if ( _____ ) {
                _____
            }

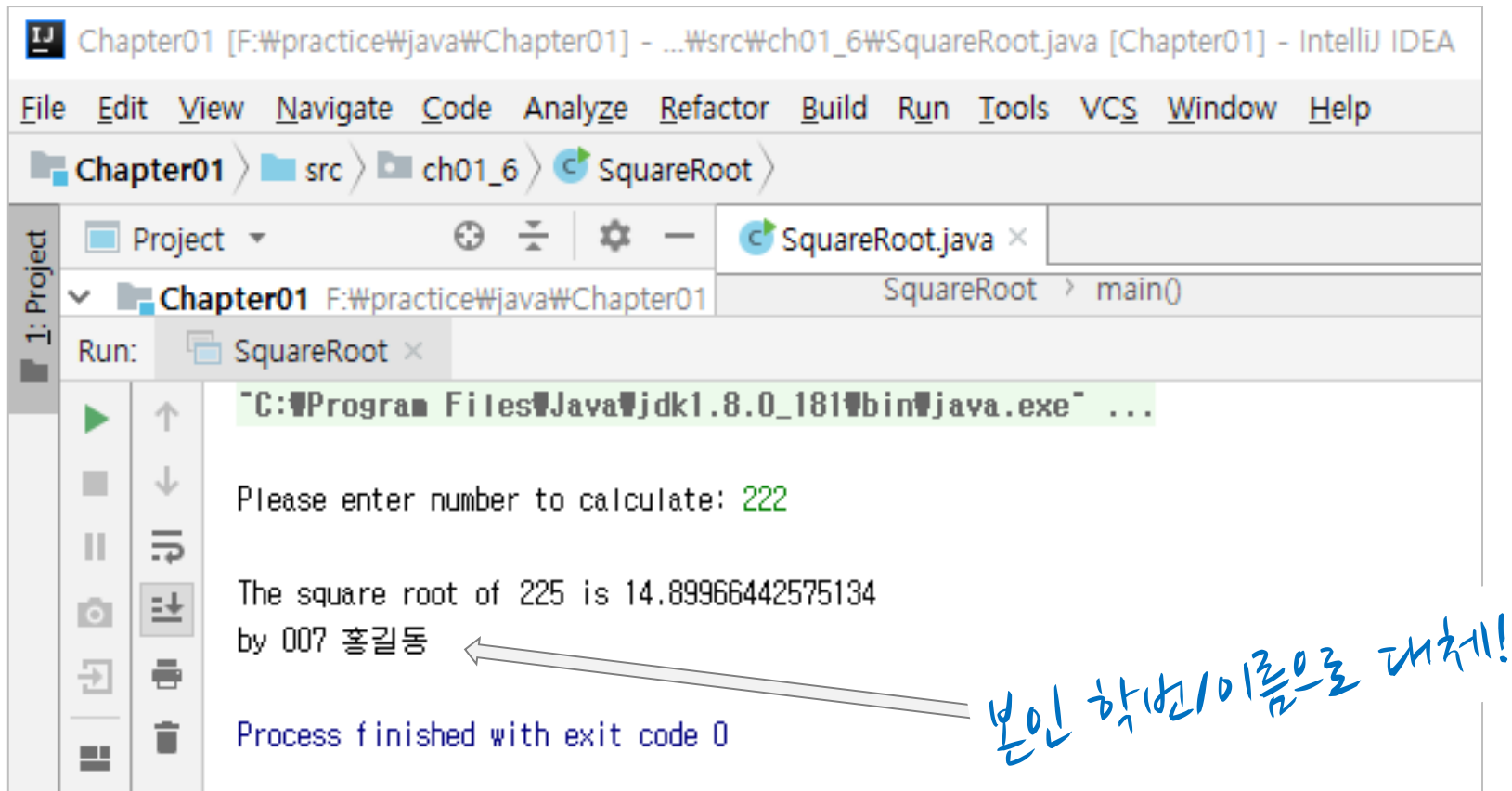
            _____
            if ( x == 1 ) {
                _____
            }

            _____
            if ( _____ ) {
                _____
            }

            System.out.println("");
            _____
        }
    }
}
```

실습과제 1-6

제곱근 구하기: 임의의 정수를 입력 받아 제곱근을 계산하여 출력하는 프로그램을 작성하시오.



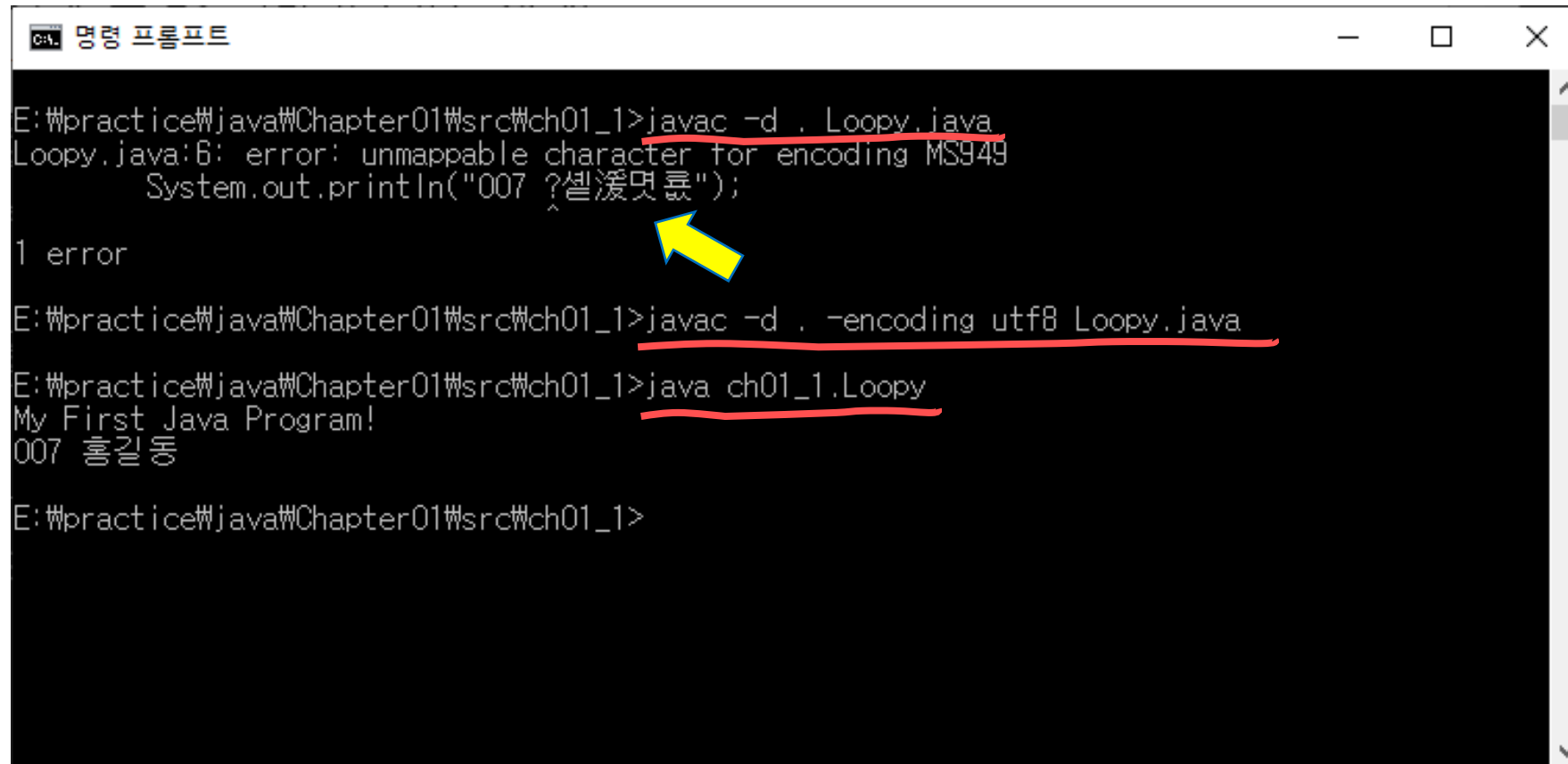
실습과제 1-7 PhraseOMatic 예제

에디터(like EditPlus) 작업 => 파일명: PhraseOMatic.java *파일명: 대소문자 구분*

```
1 package Ch01_7;    패키지명 부여!
2
3 public class PhraseOMatic {
4     public static void main(String[] args) {
5         String[] wordListOne = {"24/7", "multi-Tier", "30,000 foot", "B-to-B",
6             "win-win", "front-end", "web-based", "pervasive", "smart", "six-sigma",
7             "critical-path", "dynamic"};
8         String[] wordListTwo = {"empowered", "sticky", "value-added", "oriented", "centric",
9             "distributed", "clustered", "branded", "outside-the-box", "positioned", "networked",
10            "focused", "leveraged", "aligned", "targeted", "shared", "cooperative", "accelerated"};
11        String[] wordListThree = {"process", "tipping-point", "solution", "architecture", "core competency",
12            "strategy", "mindshare", "portal", "space", "vision", "paradigm", "mission"};
13        int oneLength = wordListOne.length;
14        int twoLength = wordListTwo.length;
15        int threeLength = wordListThree.length;
16        int rand1 = (int) (Math.random() * oneLength);
17        int rand2 = (int) (Math.random() * twoLength);
18        int rand3 = (int) (Math.random() * threeLength);
19
20        String phrase = wordListOne[rand1] + " " + wordListTwo[rand2] + " " + wordListThree[rand3];
21        System.out.println("What we need is a " + phrase);
22    }
23 }
24
```

DOS command line으로 실행 (Optional)

명령 프롬프트 창 열기: 윈도우 검색: cmd => 명령 프롬프트 선택!



```
명령 프롬프트
E:\practice\java\Chapter01\src\ch01_1>javac -d . Loopy.java
Loopy.java:6: error: unmappable character for encoding MS949
    System.out.println("007 ?셀?뎨뎨");
                   ^
1 error

E:\practice\java\Chapter01\src\ch01_1>javac -d . -encoding utf8 Loopy.java

E:\practice\java\Chapter01\src\ch01_1>java ch01_1.Loopy
My First Java Program!
007 홍길동

E:\practice\java\Chapter01\src\ch01_1>
```

패키지 (package)

패키지란

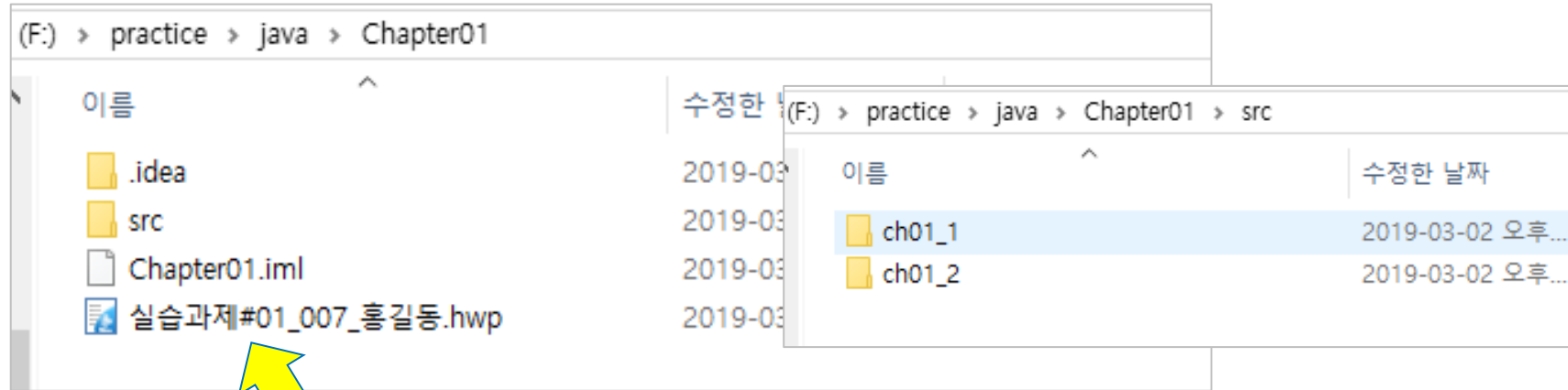
- ✓ 관련된 클래스 또는 인터페이스들을 묶어놓은 상자과 같다

특징

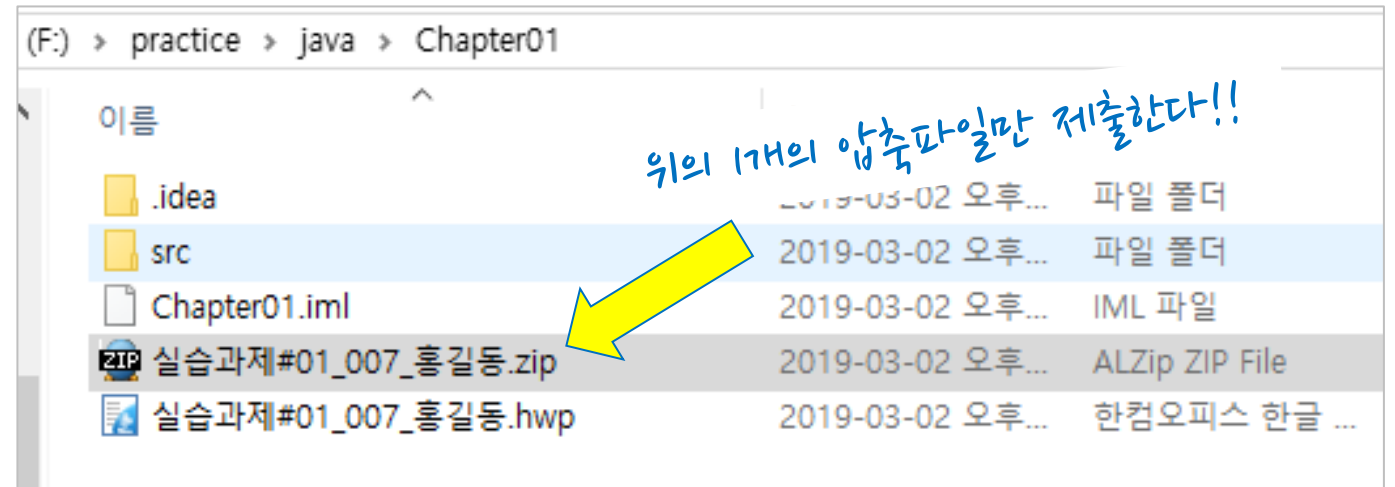
- ✓ 클래스 들을 하나로 묶어놓은 것이다
- ✓ 클래스 들의 이름 중복으로 발생하는 충돌을 막아준다
- ✓ 클래스 들을 기능 별로 분류할 수 있어 필요한 클래스의 식별을 용이하게 한다

package 패키지 이름/패키지 경로; // ex) **package com.skimok**

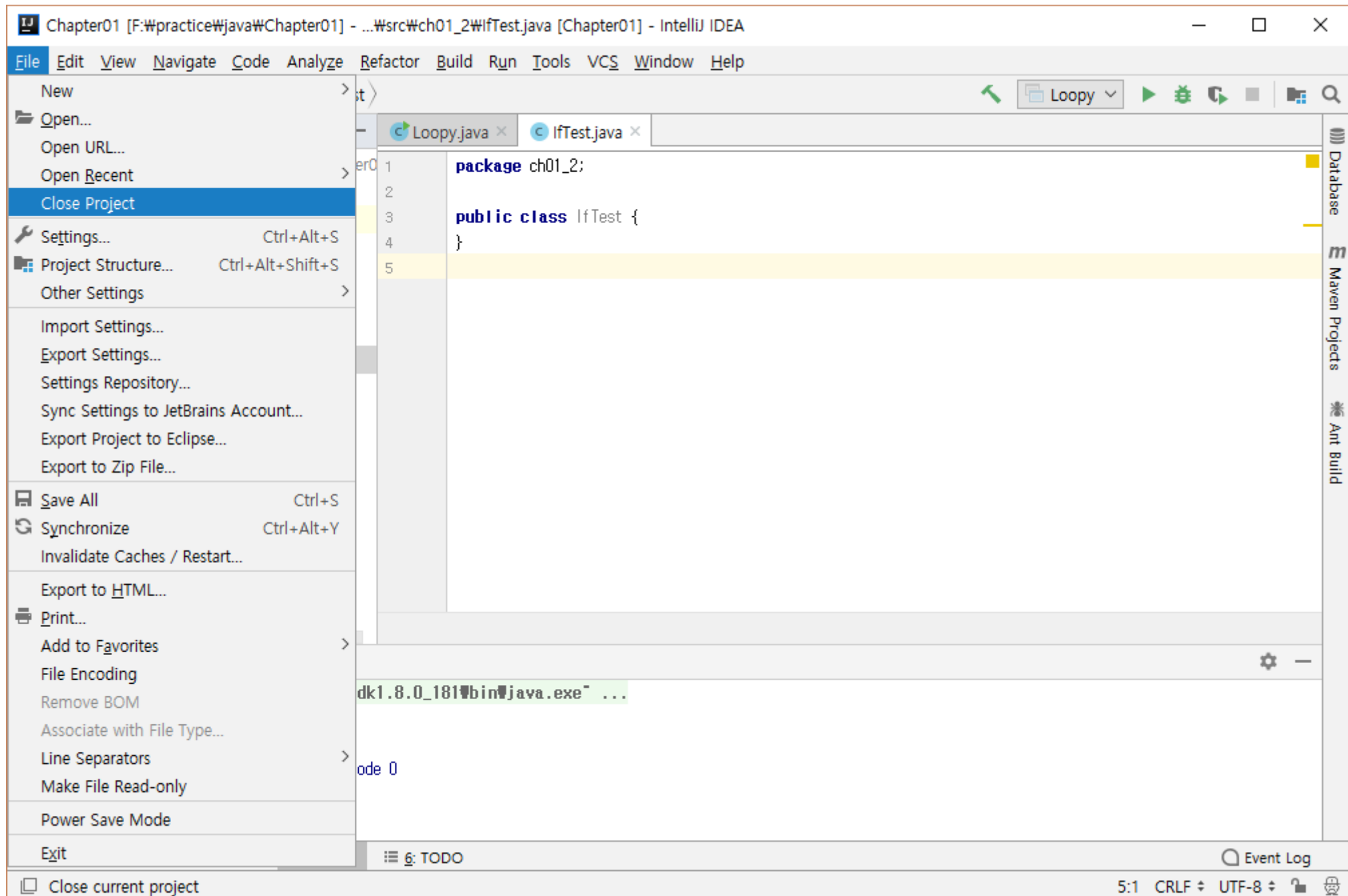
설명문서/과제 소스 코드 제출

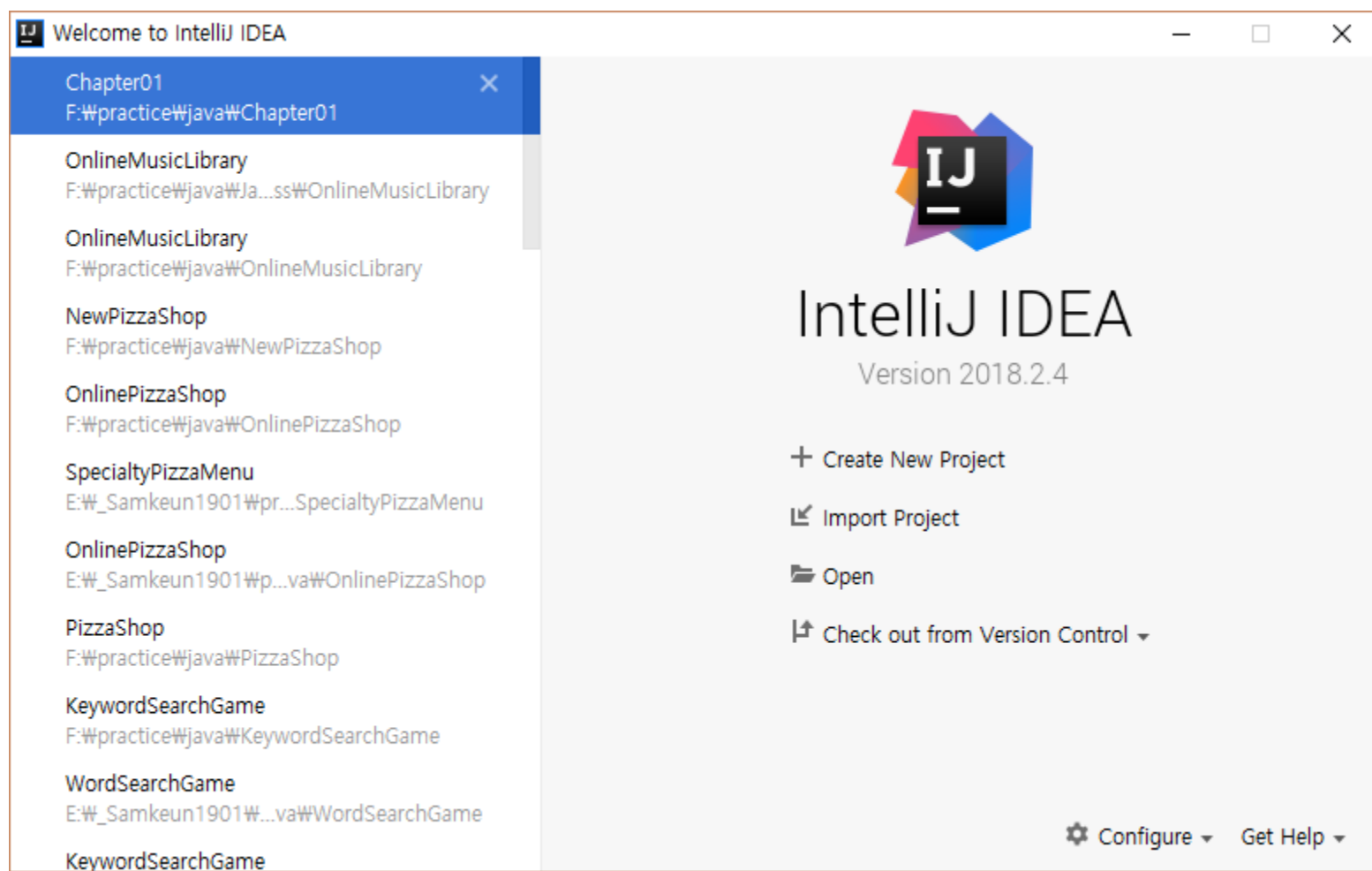


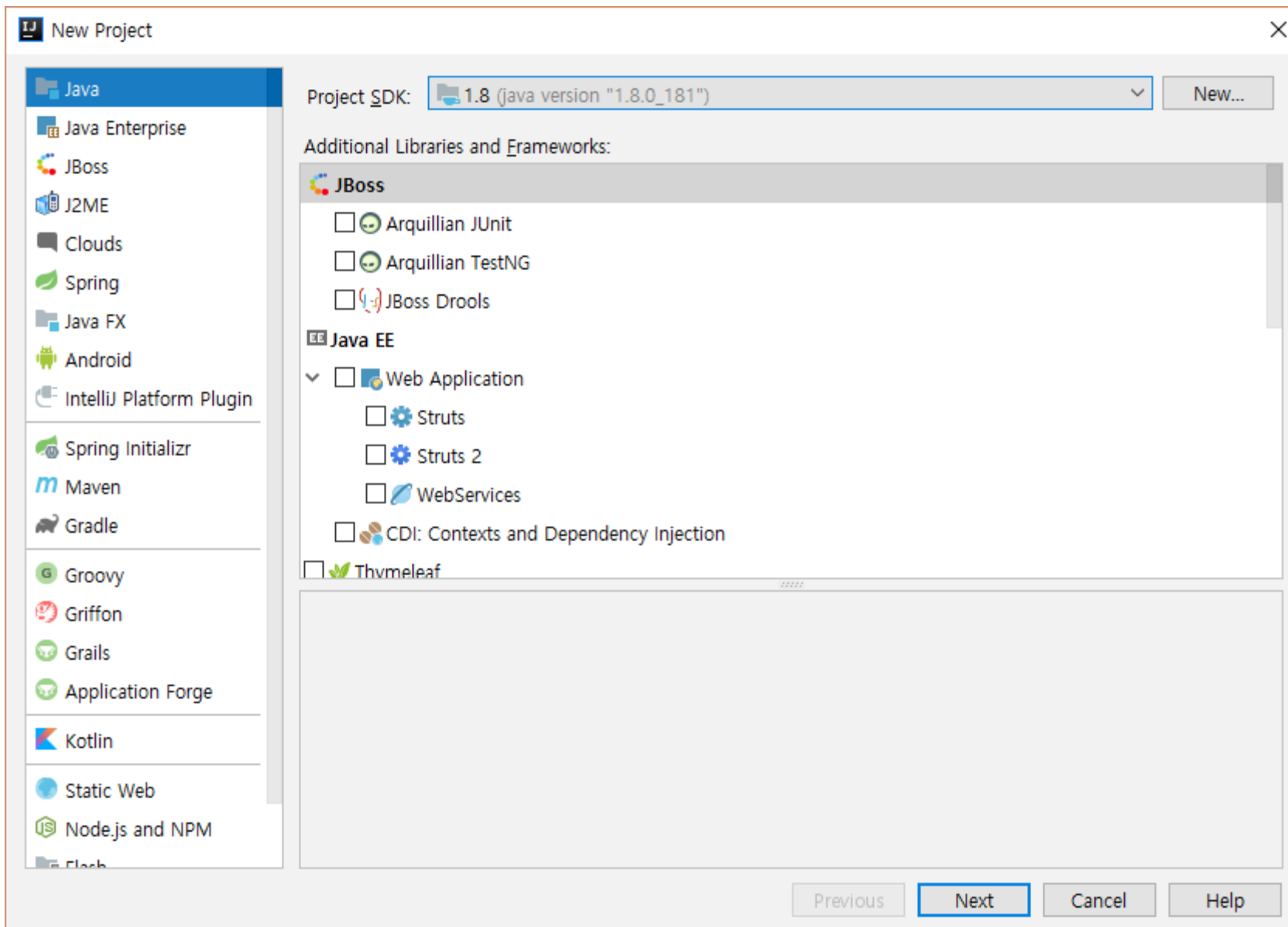
설명문서와 소스 폴더를 함께 압축!!
반드시 *.iml 파일이 존재해야 함.



위의 1개의 압축파일만 제출한다!!







New Project

×

Project name:

Chapter02

Project location:

F:\practice\java\Chapter02

...

▼ More Settings

Module name:

Chapter02

Content root:

F:\practice\java\Chapter02

📁

Module file location:

F:\practice\java\Chapter02

📁

Project format:

.idea (directory based) ▼

Previous

Finish

Cancel

Help

