

# Configure for Lab

**Bok, Jong Soon**  
**javaexpert@nate.com**

**<https://github.com/swacademy/Spring5>**

# Contents

- JDK 13.x Installation and Configuration
- Eclipse JEE Download and Configuration
- Maven 3.6.3 Configuration
- Maven Project in Eclipse
- Tomcat 9.0.33 Installation and Configuration
- STS 4.6.0.RELEASE Download and Configuration
- STS3 Add-On Installation
- Lombok 1.18.12 Library Installation
- Spring Web MVC Demo Project



---

# I. JDK 13.x



# JDK 13.x Installation and Configuration

- JDK : <https://www.oracle.com/technetwork/java/javase/downloads/index.html>
- Documentation : <https://docs.oracle.com/en/java/javase/13/>
- API : <https://docs.oracle.com/en/java/javase/13/docs/api/index.html>

# JDK 1.8.x Installation and Configuration (Cont.)

- JAVA\_HOME
- PATH

```
C:\Users\Instructor>set JAVA_HOME  
JAVA_HOME=C:\Program Files\Java\jdk-13.0.2
```

```
C:\Users\Instructor>set PATH  
Path=C:\Program Files\Java\jdk-13.0.2\bin;C:\Program Files\apache-maven-3.6.3\bin;C:\Windows\system32;C:\Windows;C:\Windows\System32\Wbem;C:\Windows\System32\WindowsPowerShell\v1.0;C:\Windows\System32\OpenSSH;C:\Users\Instructor\AppData\Local\Microsoft\WindowsApps;C:\Program Files\Bandizip#  
PATHEXT=.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC
```

# JDK 1.8.x Installation and Configuration (Cont.)

- javac & java -version

```
C:\#Users#Instructor>javac -version  
javac 13.0.2
```

```
C:\#Users#Instructor>java -version  
java version "13.0.2" 2020-01-14  
Java(TM) SE Runtime Environment (build 13.0.2+8)  
Java HotSpot(TM) 64-Bit Server VM (build 13.0.2+8, mixed mode, sharing)
```



---

## II. Eclipse JEE




# Eclipse JEE Download and Configuration

Eclipse Packages | The Eclipse F x +

eclipse.org/downloads/packages/

## Eclipse IDE 2019-12 R Packages




**Eclipse IDE for Enterprise Java Developers**

353 MB 423,526 DOWNLOADS

Tools for Java developers creating Enterprise Java and Web applications, including a Java IDE, tools for Enterprise Java, JPA, JSF, Mylyn, Maven, Git and more.  
[Click here to file a bug against Eclipse Web Tools Platform.](#)  
[Click here to file a bug against Eclipse Platform.](#)  
[Click here to file a bug against Maven integration for web projects.](#)

Windows 64-bit  
Mac Cocoa 64-bit  
Linux 64-bit




**Eclipse IDE for Java Developers**

201 MB 252,397 DOWNLOADS

The essential tools for any Java developer, including a Java IDE, a Git client, XML Editor, Mylyn, Maven and Gradle integration

Windows 64-bit  
Mac Cocoa 64-bit  
Linux 64-bit




**Eclipse IDE for C/C++ Developers**

237 MB 70,069 DOWNLOADS

An IDE for C/C++ developers with Mylyn integration.

Windows 64-bit  
Mac Cocoa 64-bit  
Linux 64-bit



Get **Eclipse IDE 2019-12**

Install your favorite desktop IDE packages.

[Download 64 bit](#)

[Download Packages](#) | [Need Help?](#)

### RELATED LINKS

- [Compare & Combine Packages](#)
- [New and Noteworthy](#)
- [Install Guide](#)
- [Documentation](#)
- [Updating Eclipse](#)
- [Forums](#)
- [Simultaneous Release](#)

Some Eclipse Foundation pages use cookies to better serve you when you return to the site. You can set your browser to notify you before you receive a cookie or turn off cookies. If you do so, however, some areas of some sites may not function properly. To read Eclipse Foundation Privacy Policy [click here.](#)

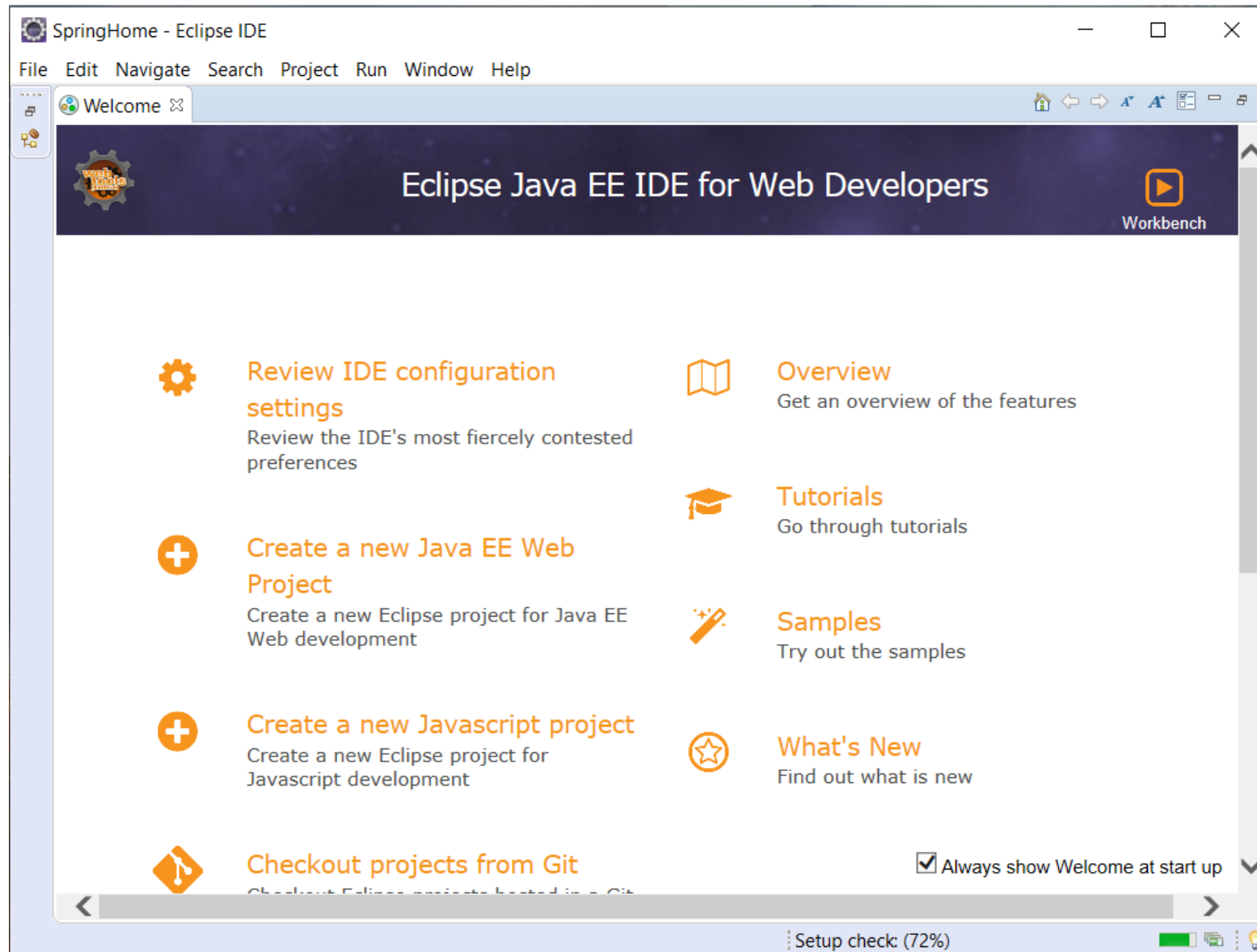
Decline Allow cookies

검색하려면 여기에 입력하세요.

오후 4:28 2020-02-18



# Eclipse JEE Download and Configuration (Cont.)



# III. Maven 3.6.3



# Maven 3.6.3 Configuration

- <http://maven.apache.org/>
- Refer to : <http://javacan.tistory.com/entry/MavenBasic>
- Download
  - <http://maven.apache.org/download.cgi>
  - Binary zip archive : apache-maven-3.6.3-bin.zip

## Maven 3.6.3 Configuration (Cont.)

- M2\_HOME(C: \ Program Files \ apache-maven-3.6.3) 설정
- PATH에 (%M2\_HOME% \ bin) 추가

```
C:\Users\Instructor>set M2_HOME  
M2_HOME=C:\Program Files\apache-maven-3.6.3
```

```
C:\Users\Instructor>set PATH  
Path=C:\Program Files\Java\jdk-13.0.2\bin;C:\Program Files\apache-maven-3.6.3\bin;C:\Windows\system32;C:\Windows;C:\Windows\System32\Wbem;C:\Windows\System32\WindowsPowerShell\v1.0;C:\Windows\System32\OpenSSH;C:\Users\Instructor\AppData\Local\Microsoft\WindowsApps;C:\Program Files\Bandizip;PATHEXT=.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC
```

# Maven 3.6.x Configuration (Cont.)

## ■ 설치 확인

\$ **mvn -version**

```
C:\Users\Instructor>mvn -version
Apache Maven 3.6.3 (cecedd343002696d0abb50b32b541b8a6ba2883f)
Maven home: C:\Program Files\apache-maven-3.6.3\bin\..
Java version: 13.0.2, vendor: Oracle Corporation, runtime: C:\Program Files\Java\jdk-13.0.2
Default locale: ko_KR, platform encoding: MS949
OS name: "windows 10", version: "10.0", arch: "amd64", family: "windows"
```

# Maven Project

\$ **mvn archetype:generate**

C:\Windows\system32\cmd.exe

```
C:\SpringHome>mvn archetype:generate
```

## Maven Project (Cont.)

C:\Windows\system32\cmd.exe - mvn archetype:generate

```
type which contains a sample Argo (UIMA) Analysis Engine)
2581: remote -> uk.ac.nactem.argo:argo-reader-archetype (An archetype which
h contains a sample Argo (UIMA) Reader)
2582: remote -> uk.ac.rdg.resc.edal-ncwms-based-webapp (-)
2583: remote -> uk.co.nemstix:basic-javaee7-archetype (A basic Java EE7 Ma
ven archetype)
2584: remote -> uk.co.solong:angular-spring-archetype (So Long archetype f
or RESTful spring services with an AngularJS frontend. Includes debian dep
loyment)
2585: remote -> us.fatehi:schemacrawler-archetype-maven-project (-)
2586: remote -> us.fatehi:schemacrawler-archetype-plugin-command (-)
2587: remote -> us.fatehi:schemacrawler-archetype-plugin-dbconnector (-)
2588: remote -> us.fatehi:schemacrawler-archetype-plugin-lint (-)
2589: remote -> ws.osiris:osiris-archetype (Maven Archetype for Osiris)
2590: remote -> xyz.luan.generator:xyz-gae-generator (-)
2591: remote -> xyz.luan.generator:xyz-generator (-)
2592: remote -> za.co.absa.hyperdrive:component-archetype (-)
Choose a number or apply filter (format: [groupId:]artifactId, case sensit
ive contains): 1498:
```

## Maven Project (Cont.)

```
C:\Windows\system32\cmd.exe - mvn archetype:generate
2586: remote -> us.fatehi:schemacrawler-archetype-plugin-command (-)
2587: remote -> us.fatehi:schemacrawler-archetype-plugin-dbconnector (-)
2588: remote -> us.fatehi:schemacrawler-archetype-plugin-lint (-)
2589: remote -> ws.osiris:osiris-archetype (Maven Archetype for Osiris)
2590: remote -> xyz.luan.generator:xyz-gae-generator (-)
2591: remote -> xyz.luan.generator:xyz-generator (-)
2592: remote -> za.co.absa.hyperdrive:component-archetype (-)
Choose a number or apply filter (format: [groupId:]artifactId, case sensitive contains): 1498:
Choose org.apache.maven.archetypes:maven-archetype-quickstart version:
1: 1.0-alpha-1
2: 1.0-alpha-2
3: 1.0-alpha-3
4: 1.0-alpha-4
5: 1.0
6: 1.1
7: 1.3
8: 1.4
Choose a number: 8: 
```



# Maven Project (Cont.)

```
C:\Windows\system32\cmd.exe - mvn archetype:generate
1: 1.0-alpha-1
2: 1.0-alpha-2
3: 1.0-alpha-3
4: 1.0-alpha-4
5: 1.0
6: 1.1
7: 1.3
8: 1.4
Choose a number: 8: 8
Define value for property 'groupId': com.example
Define value for property 'artifactId': demo
Define value for property 'version' 1.0-SNAPSHOT: :
Define value for property 'package' com.example: :
Confirm properties configuration:
groupId: com.example
artifactId: demo
version: 1.0-SNAPSHOT
package: com.example
Y: :
```

# Maven Project (Cont.)

C:\Windows\system32\cmd.exe

```
[INFO] Parameter: version, Value: 1.0-SNAPSHOT
[INFO] Parameter: package, Value: com.example
[INFO] Parameter: packageInPathFormat, Value: com/example
[INFO] Parameter: package, Value: com.example
[INFO] Parameter: groupId, Value: com.example
[INFO] Parameter: artifactId, Value: demo
[INFO] Parameter: version, Value: 1.0-SNAPSHOT
[INFO] Project created from Archetype in dir: C:\SpringHome\demo
[INFO] -----
```

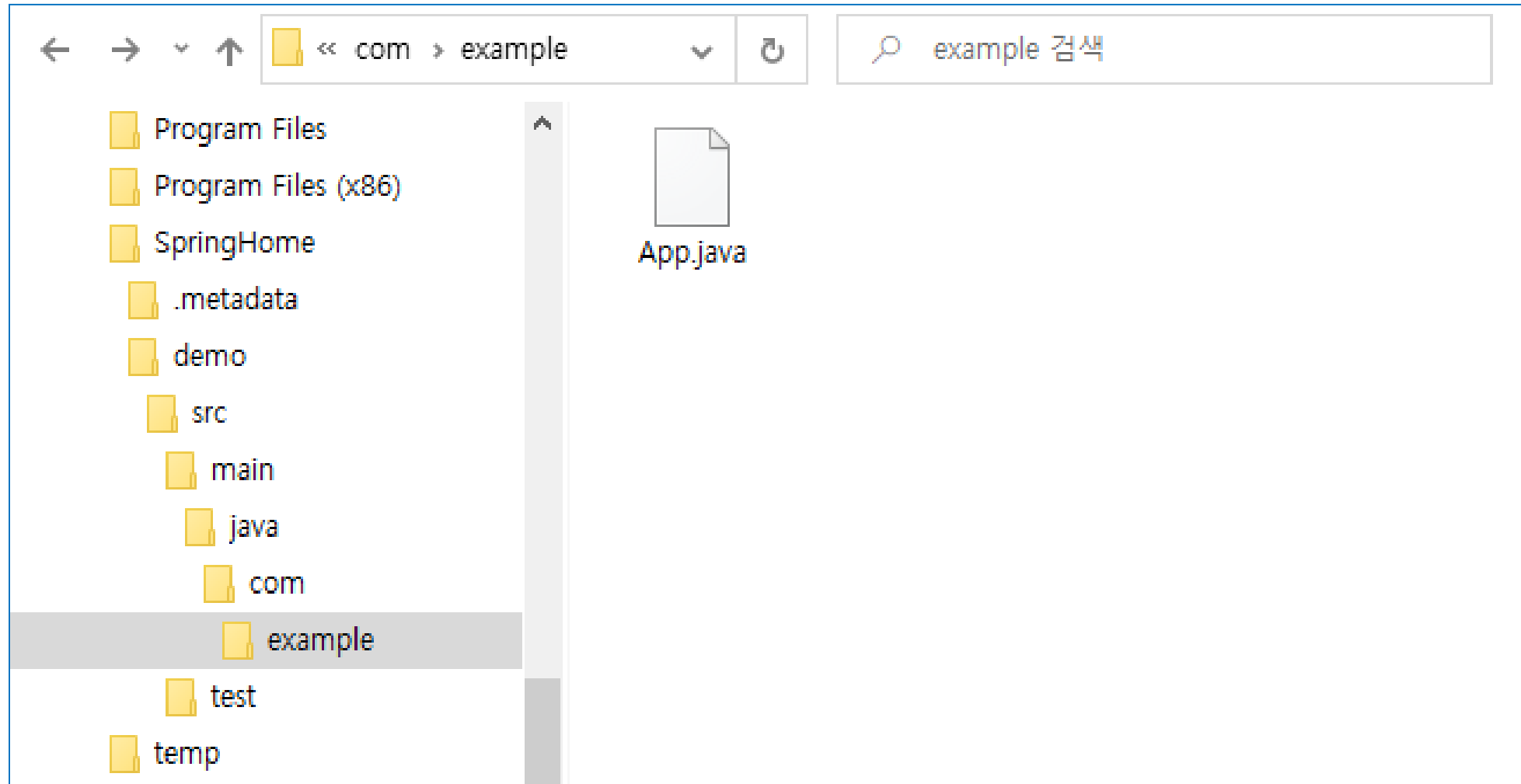
```
[INFO] BUILD SUCCESS
```

```
[INFO] -----
```

```
[INFO] Total time: 04:34 min
[INFO] Finished at: 2020-03-16T17:46:19+09:00
[INFO] -----
```

```
C:\SpringHome>
```

# Maven Project (Cont.)



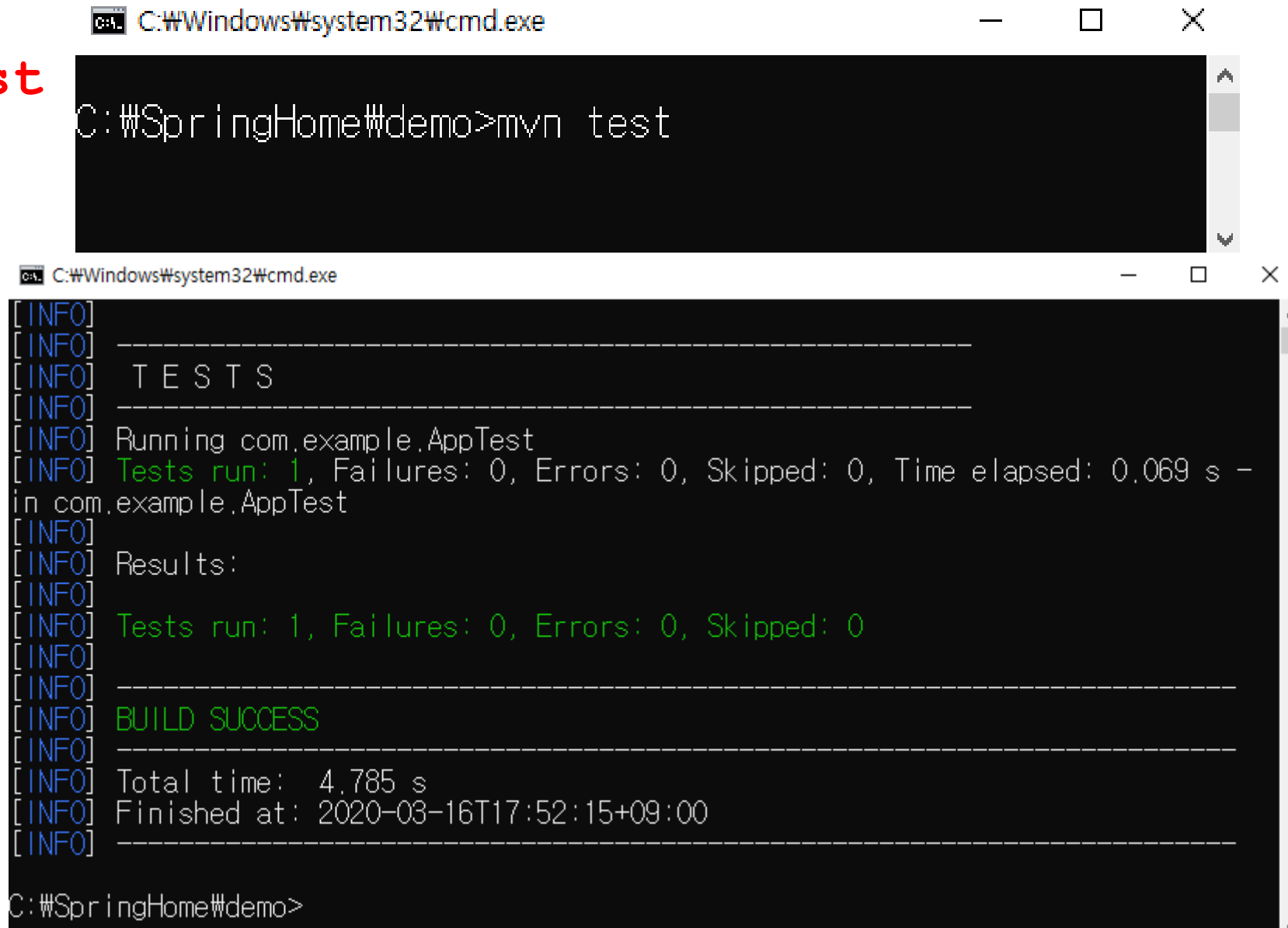
# Maven Project (Cont.)

\$ **mvn compile**

```
C:\Windows\system32\cmd.exe
C:\SpringHome\demo>mvn compile
[INFO] Scanning for projects...
[INFO]
[INFO] -----< com.example:demo >-----
[INFO] Building demo 1.0-SNAPSHOT
[INFO] -----[ jar ]-----
[INFO]
[INFO] --- maven-resources-plugin:3.0.2:resources (default-resources) @ demo ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory C:\SpringHome\demo\src\main\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.8.0:compile (default-compile) @ demo ---
[INFO] Changes detected - recompiling the module!
[INFO] Compiling 1 source file to C:\SpringHome\demo\target\classes
[INFO]
[INFO] BUILD SUCCESS
[INFO]
[INFO] Total time: 2.764 s
[INFO] Finished at: 2020-03-16T17:49:52+09:00
[INFO]
C:\SpringHome\demo>
```

# Maven Project (Cont.)

\$ **mvn test**

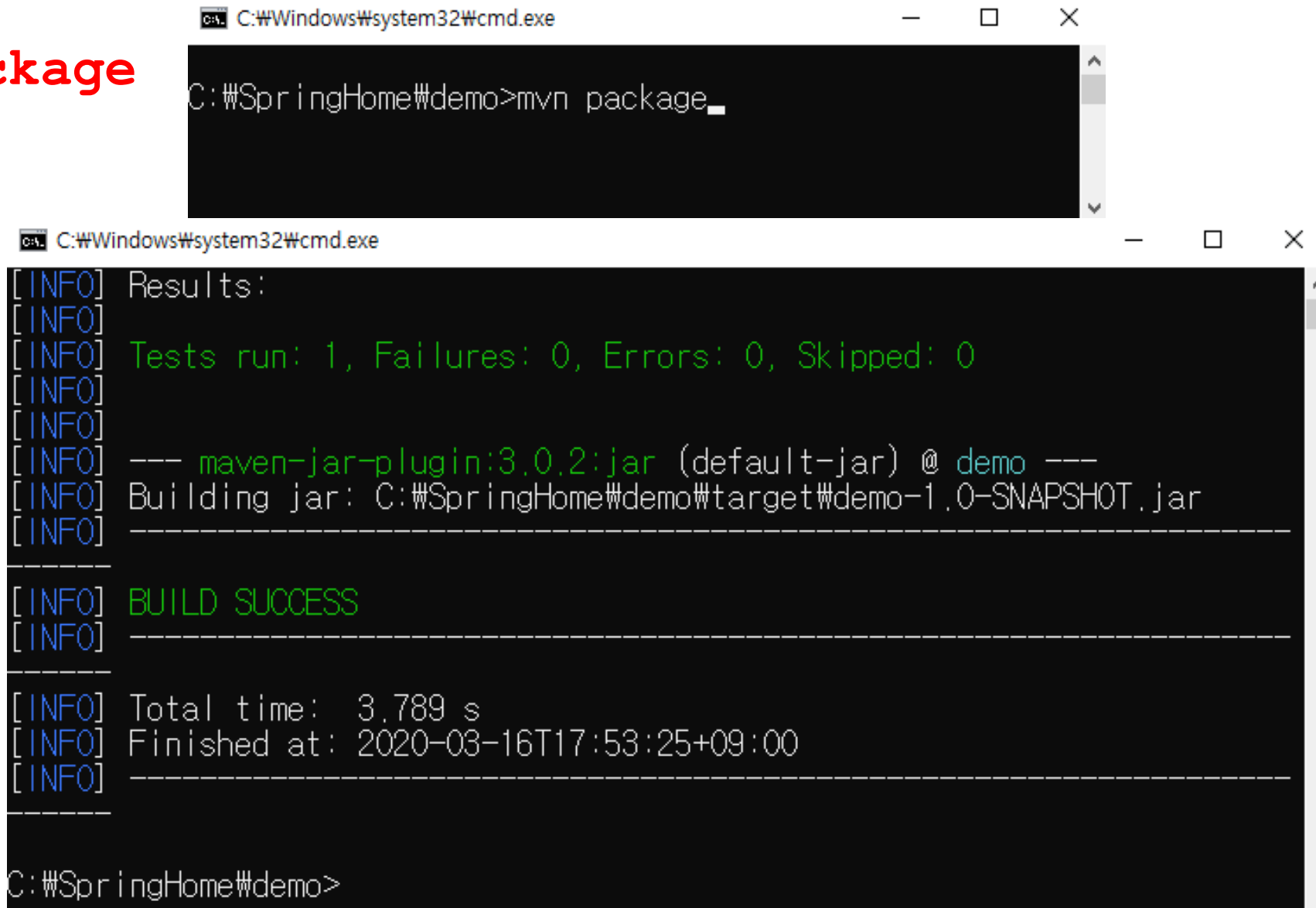


```
C:\Windows\system32\cmd.exe
C:\SpringHome\demo>mvn test

[INFO]
[INFO] -----
[INFO]  T E S T S
[INFO] -----
[INFO] Running com.example.AppTest
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.069 s -
in com.example.AppTest
[INFO]
[INFO] Results:
[INFO]
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0
[INFO]
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 4.785 s
[INFO] Finished at: 2020-03-16T17:52:15+09:00
[INFO] -----
C:\SpringHome\demo>
```

# Maven Project (Cont.)

\$ **mvn package**

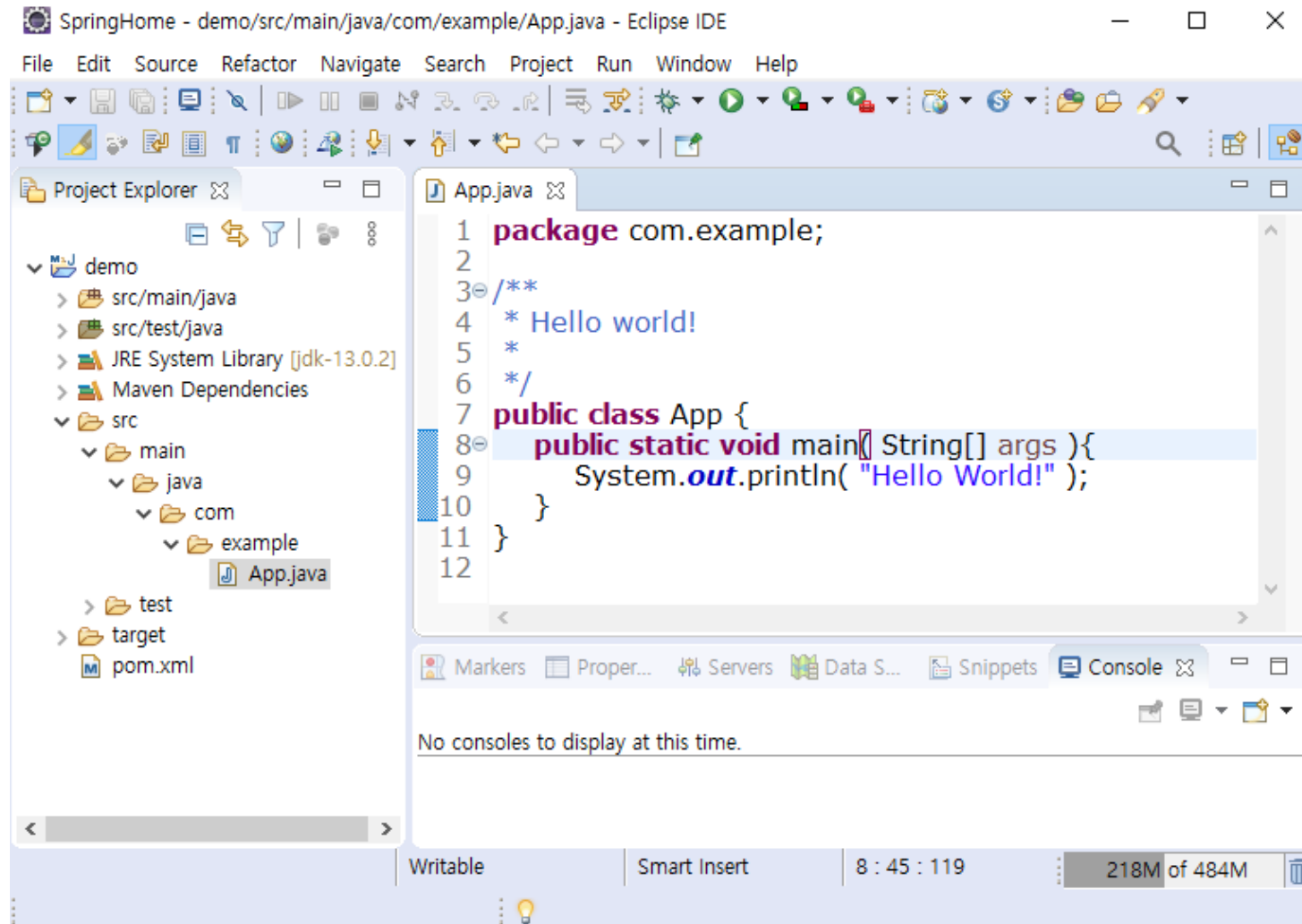


```
C:\Windows\system32\cmd.exe
C:\SpringHome\demo>mvn package

[INFO] Results:
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0
[INFO] --- maven-jar-plugin:3.0.2:jar (default-jar) @ demo ---
[INFO] Building jar: C:\SpringHome\demo\target\demo-1.0-SNAPSHOT.jar
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 3.789 s
[INFO] Finished at: 2020-03-16T17:53:25+09:00
[INFO] -----
C:\SpringHome\demo>
```

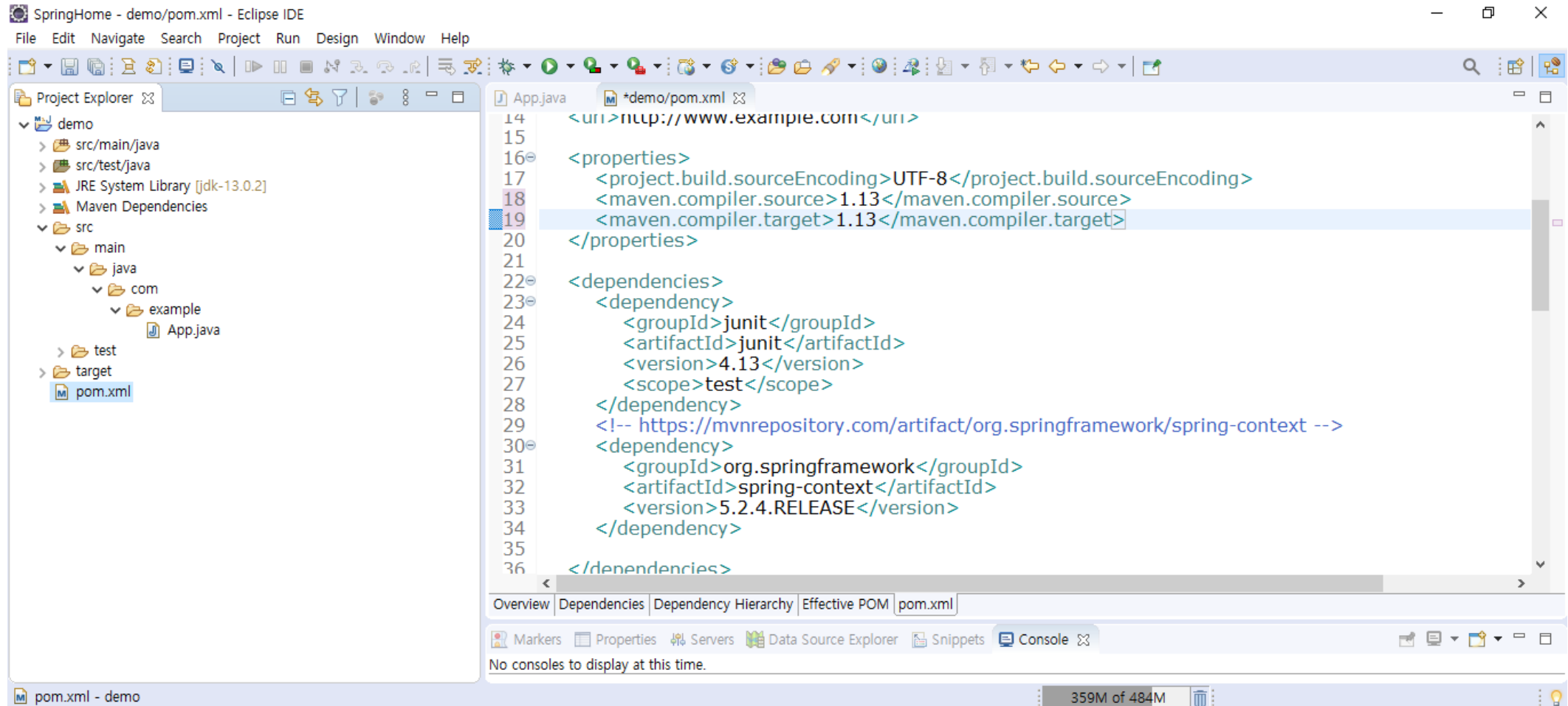
# Maven Project (Cont.)

## ■ Eclipse에서 Maven Project Import 하기



# Maven Project (Cont.)

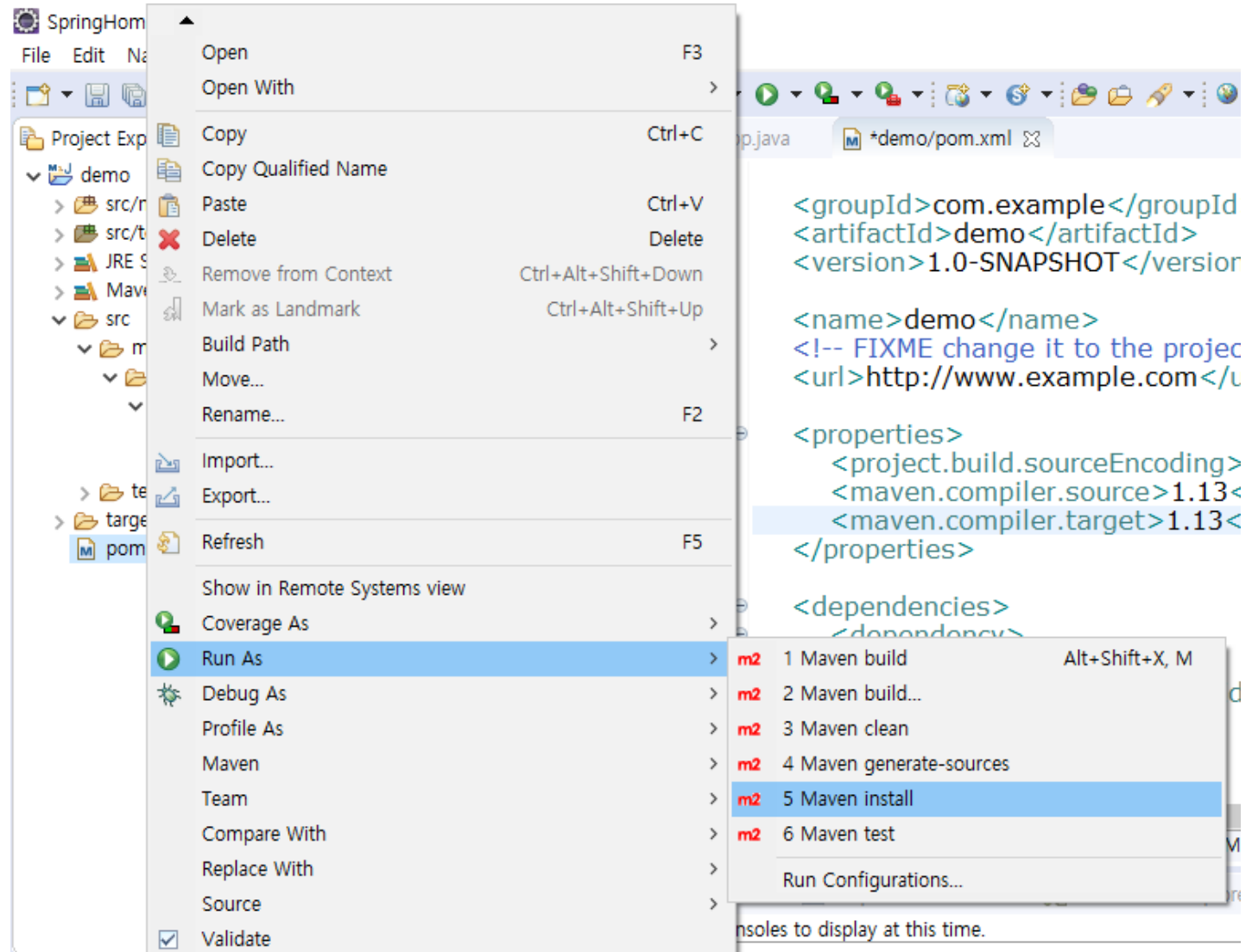
## ■ Eclipse에서 Maven Project Import 하기





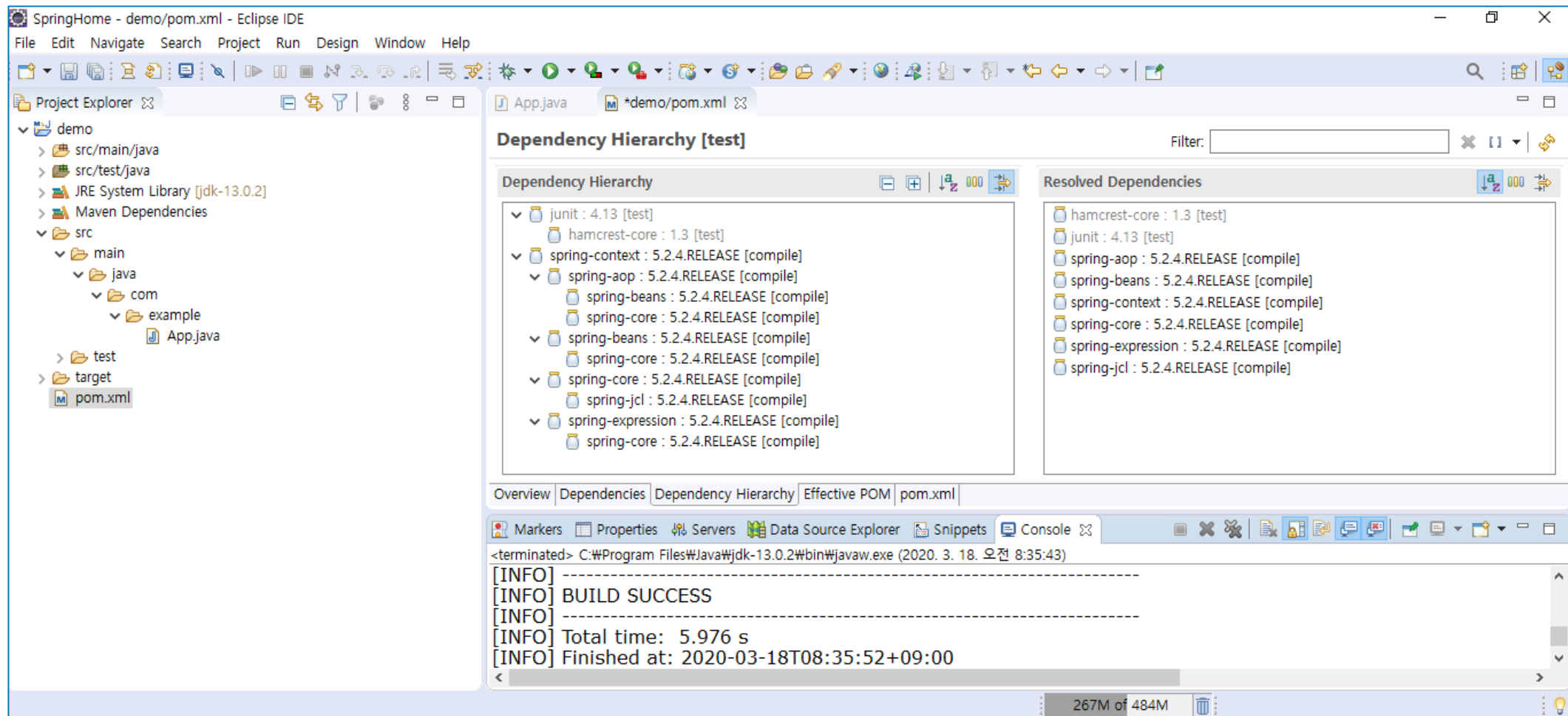
# Maven Project (Cont.)

- Eclipse에서 Maven Project Import 하기



# Maven Project (Cont.)

## ■ Eclipse에서 Maven Project Import 하기



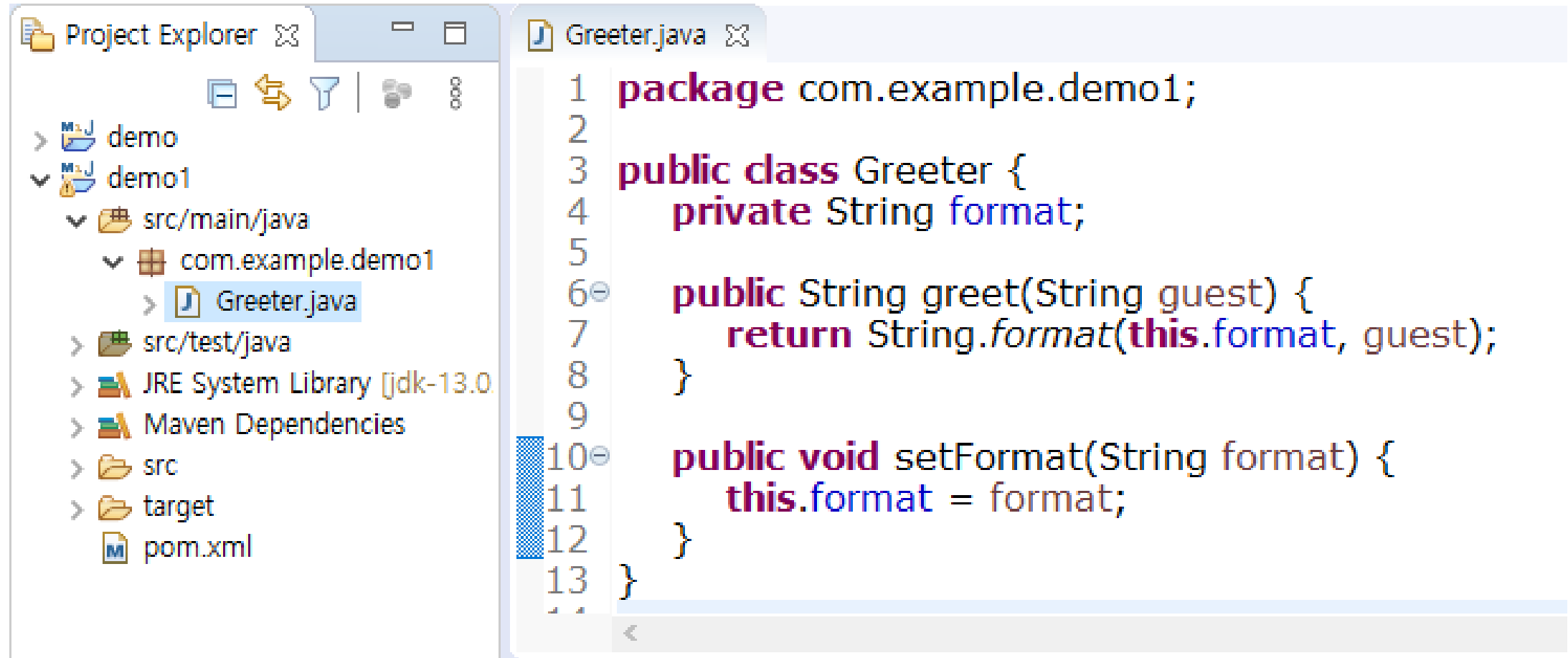


---

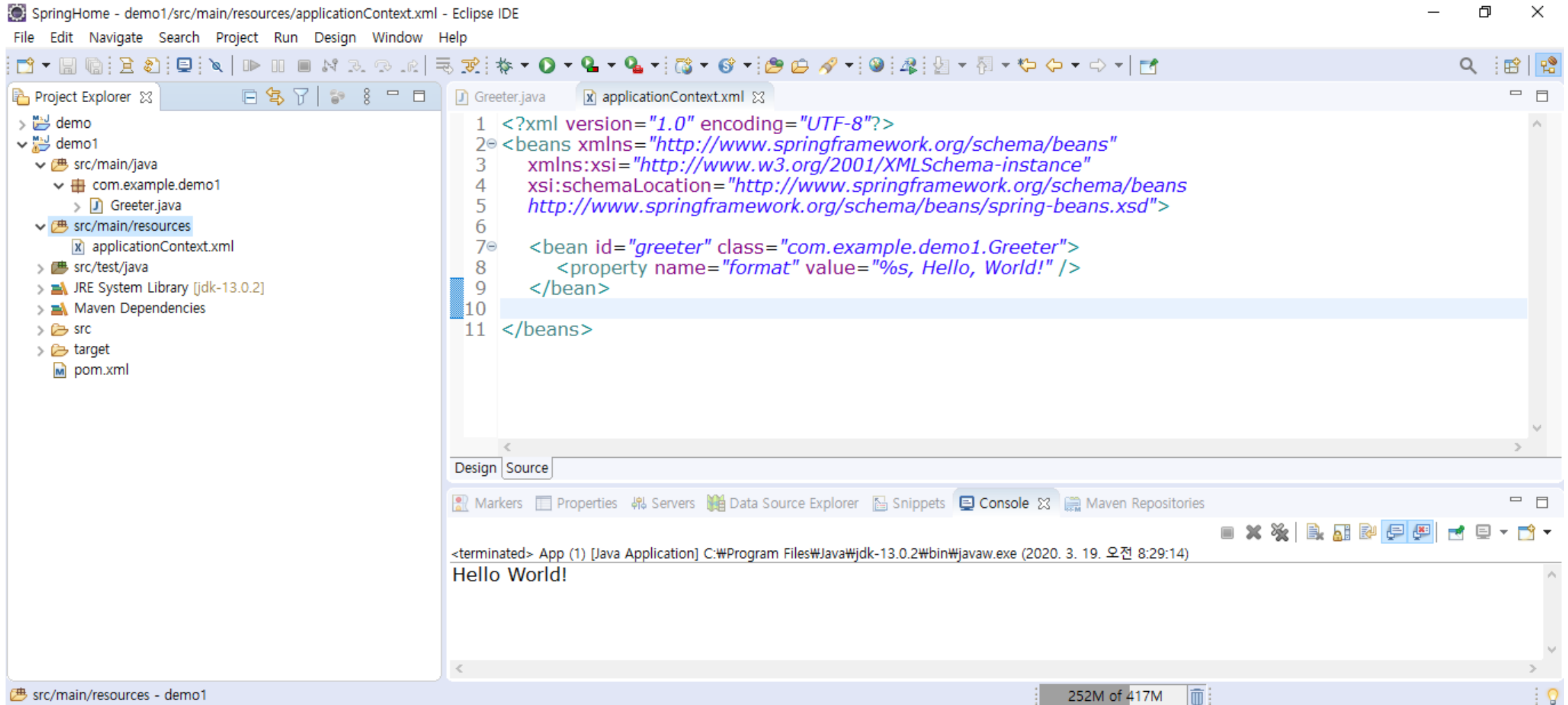
## IV. Maven Project In Eclipse



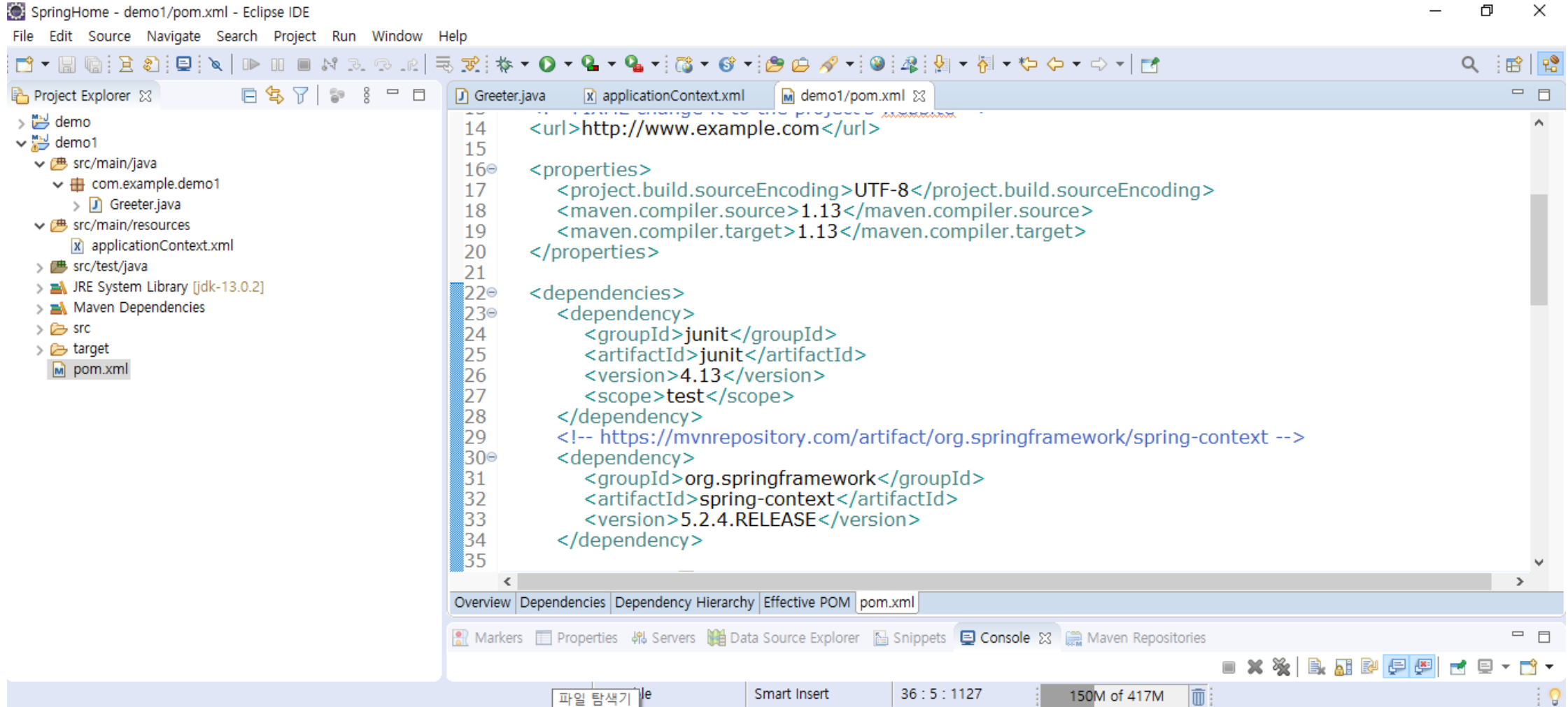
# Maven Project in Eclipse



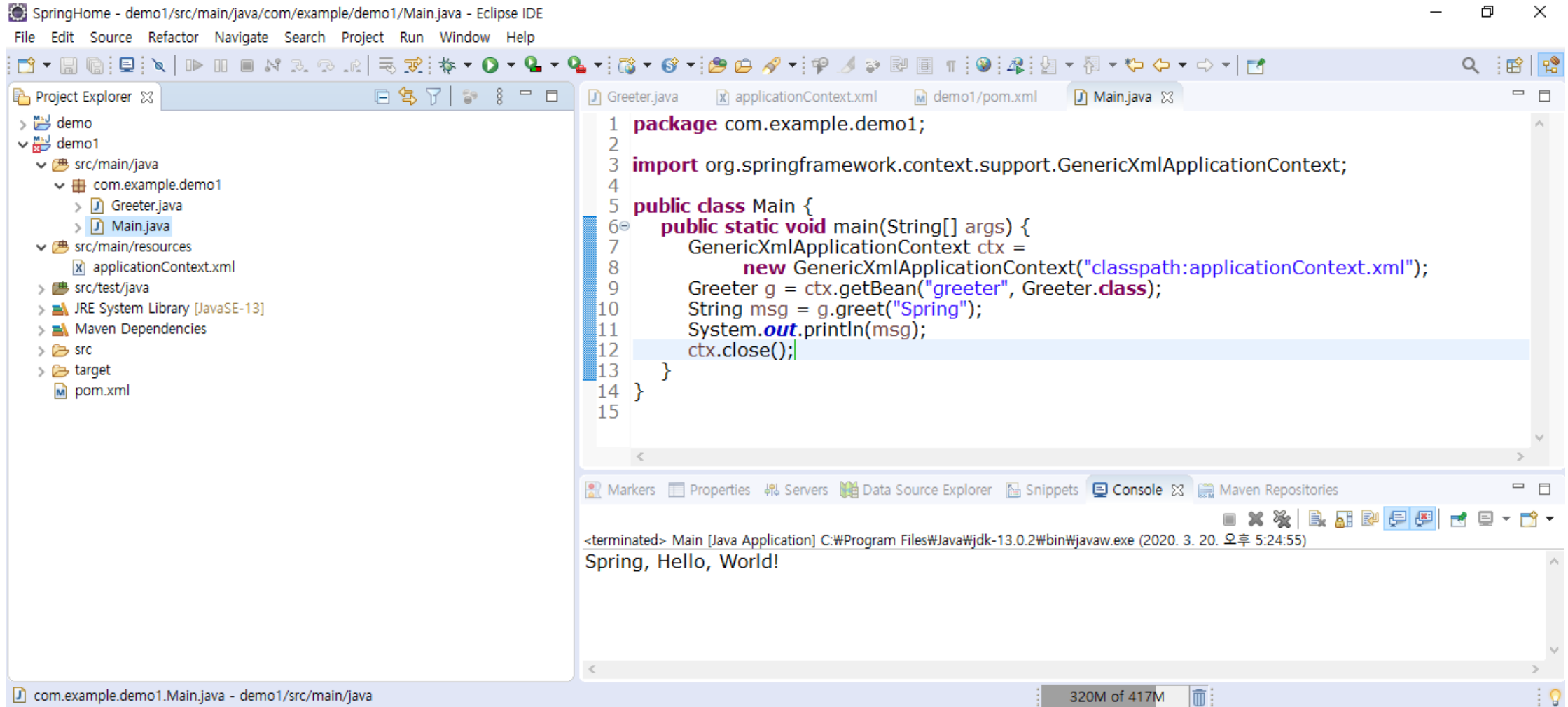
# Maven Project in Eclipse (Cont.)



# Maven Project in Eclipse (Cont.)



# Maven Project in Eclipse (Cont.)





---

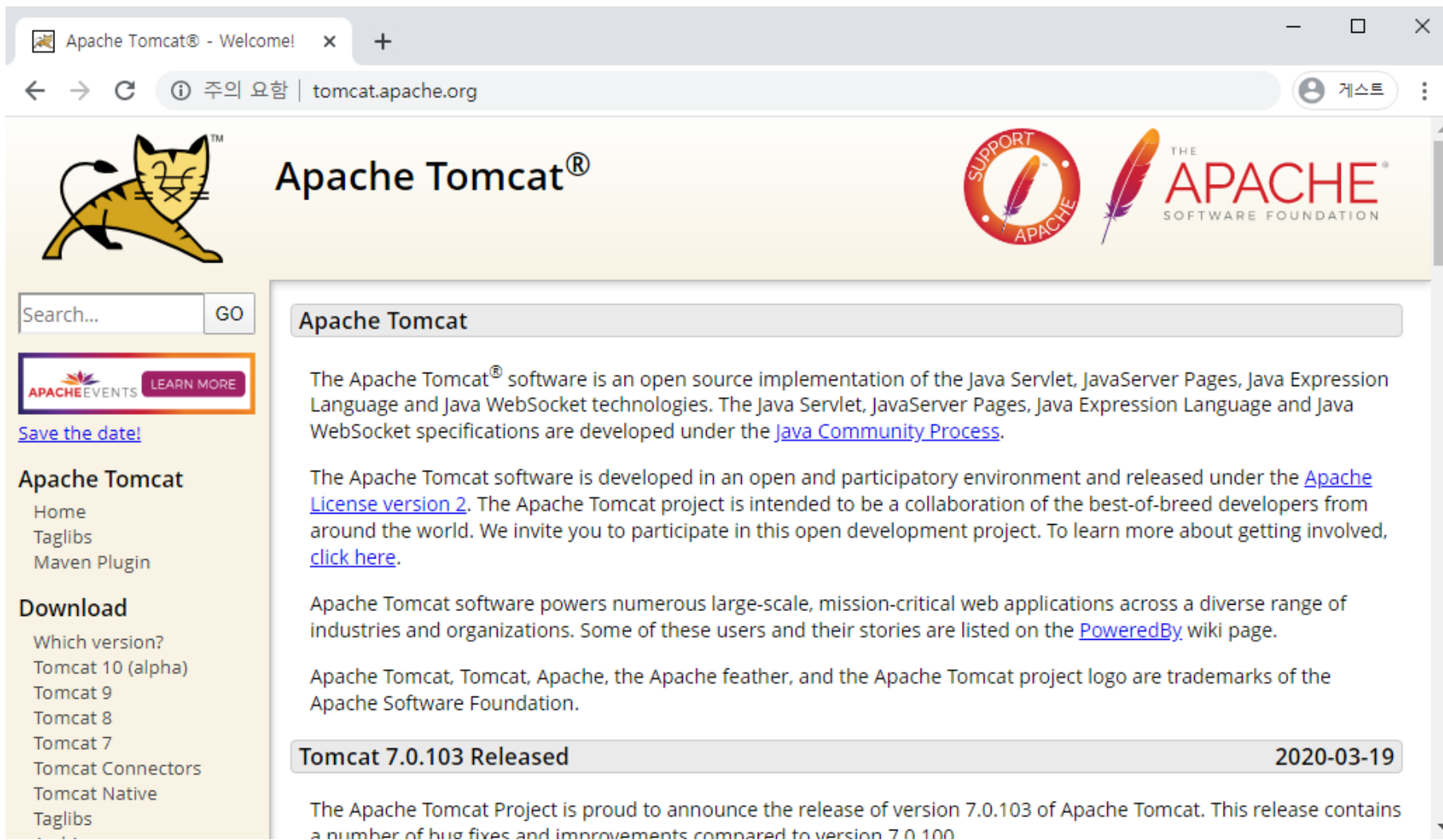
**V. Tomcat 9.0.33**





# Tomcat Installation

- <http://tomcat.apache.org/>



The screenshot shows the Apache Tomcat website in a web browser. The browser's address bar displays 'tomcat.apache.org'. The website header features the Tomcat logo (a yellow cat) and the text 'Apache Tomcat®'. To the right of the header are logos for 'SUPPORT APACHE' and 'THE APACHE SOFTWARE FOUNDATION'. Below the header, there is a search bar with the text 'Search...' and a 'GO' button. A sidebar on the left contains a 'Save the date!' link, a 'Learn More' button, and a list of links: 'Home', 'Taglibs', 'Maven Plugin', 'Download', 'Which version?', 'Tomcat 10 (alpha)', 'Tomcat 9', 'Tomcat 8', 'Tomcat 7', 'Tomcat Connectors', 'Tomcat Native', and 'Taglibs'. The main content area has a heading 'Apache Tomcat' and contains several paragraphs of text. The first paragraph describes the software as an open source implementation of Java Servlet, JavaServer Pages, Java Expression Language and Java WebSocket technologies. The second paragraph mentions the development environment and the Apache License version 2. The third paragraph states that the software powers numerous large-scale, mission-critical web applications. The fourth paragraph lists trademarks. At the bottom, there is a section titled 'Tomcat 7.0.103 Released' with the date '2020-03-19' and a brief announcement about the release.

Apache Tomcat®

Search... GO

APACHE EVENTS LEARN MORE

[Save the date!](#)

**Apache Tomcat**

- Home
- Taglibs
- Maven Plugin

**Download**

- Which version?
- Tomcat 10 (alpha)
- Tomcat 9
- Tomcat 8
- Tomcat 7
- Tomcat Connectors
- Tomcat Native
- Taglibs

**Apache Tomcat**

The Apache Tomcat® software is an open source implementation of the Java Servlet, JavaServer Pages, Java Expression Language and Java WebSocket technologies. The Java Servlet, JavaServer Pages, Java Expression Language and Java WebSocket specifications are developed under the [Java Community Process](#).

The Apache Tomcat software is developed in an open and participatory environment and released under the [Apache License version 2](#). The Apache Tomcat project is intended to be a collaboration of the best-of-breed developers from around the world. We invite you to participate in this open development project. To learn more about getting involved, [click here](#).

Apache Tomcat software powers numerous large-scale, mission-critical web applications across a diverse range of industries and organizations. Some of these users and their stories are listed on the [PoweredBy](#) wiki page.

Apache Tomcat, Tomcat, Apache, the Apache feather, and the Apache Tomcat project logo are trademarks of the Apache Software Foundation.

**Tomcat 7.0.103 Released** 2020-03-19

The Apache Tomcat Project is proud to announce the release of version 7.0.103 of Apache Tomcat. This release contains a number of bug fixes and improvements compared to version 7.0.100.

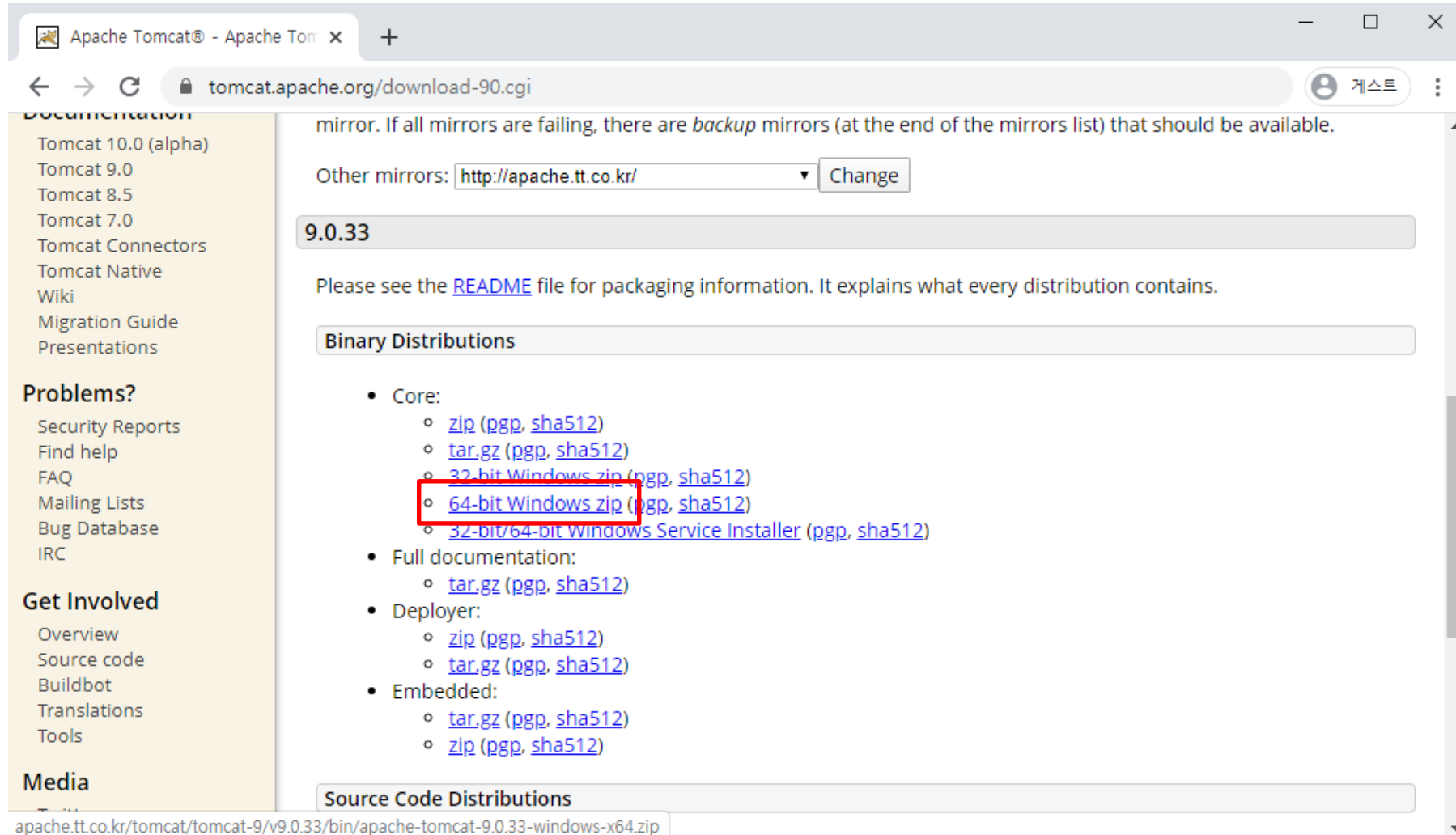
# Tomcat Installation (Cont.)

- <http://tomcat.apache.org/whichversion.html>

Servlet Spec	JSP Spec	EL Spec	WebSocket Spec	Authentication (JASIC) Spec	Apache Tomcat Version	Latest Released Version	Supported Java Versions
5.0	3.0	4.0	2.0	2.0	10.0.x	10.0.0-M3 (alpha)	8 and later
4.0	2.3	3.0	1.1	1.1	9.0.x	9.0.33	8 and later
3.1	2.3	3.0	1.1	1.1	8.5.x	8.5.53	7 and later
3.1	2.3	3.0	1.1	N/A	8.0.x (superseded)	8.0.53 (superseded)	7 and later
3.0	2.2	2.2	1.1	N/A	7.0.x	7.0.103	6 and later (7 and later for WebSocket)
2.5	2.1	2.1	N/A	N/A	6.0.x (archived)	6.0.53 (archived)	5 and later
2.4	2.0	N/A	N/A	N/A	5.5.x (archived)	5.5.36 (archived)	1.4 and later
2.3	1.2	N/A	N/A	N/A	4.1.x (archived)	4.1.40 (archived)	1.3 and later
2.2	1.1	N/A	N/A	N/A	3.3.x (archived)	3.3.2 (archived)	1.1 and later

# Tomcat Installation (Cont.)

- <https://tomcat.apache.org/download-90.cgi>



The screenshot shows a web browser window with the address bar displaying `tomcat.apache.org/download-90.cgi`. The page content includes a left sidebar with navigation links under categories like 'Documentation', 'Problems?', 'Get Involved', and 'Media'. The main content area shows the version '9.0.33' and a list of 'Binary Distributions'. In this list, the link '64-bit Windows zip (pgp, sha512)' is highlighted with a red rectangle. Below this, there is a section for 'Source Code Distributions'.

Documentation

- Tomcat 10.0 (alpha)
- Tomcat 9.0
- Tomcat 8.5
- Tomcat 7.0
- Tomcat Connectors
- Tomcat Native
- Wiki
- Migration Guide
- Presentations

Problems?

- Security Reports
- Find help
- FAQ
- Mailing Lists
- Bug Database
- IRC

Get Involved

- Overview
- Source code
- Buildbot
- Translations
- Tools

Media

mirror. If all mirrors are failing, there are *backup* mirrors (at the end of the mirrors list) that should be available.

Other mirrors:

## 9.0.33

Please see the [README](#) file for packaging information. It explains what every distribution contains.

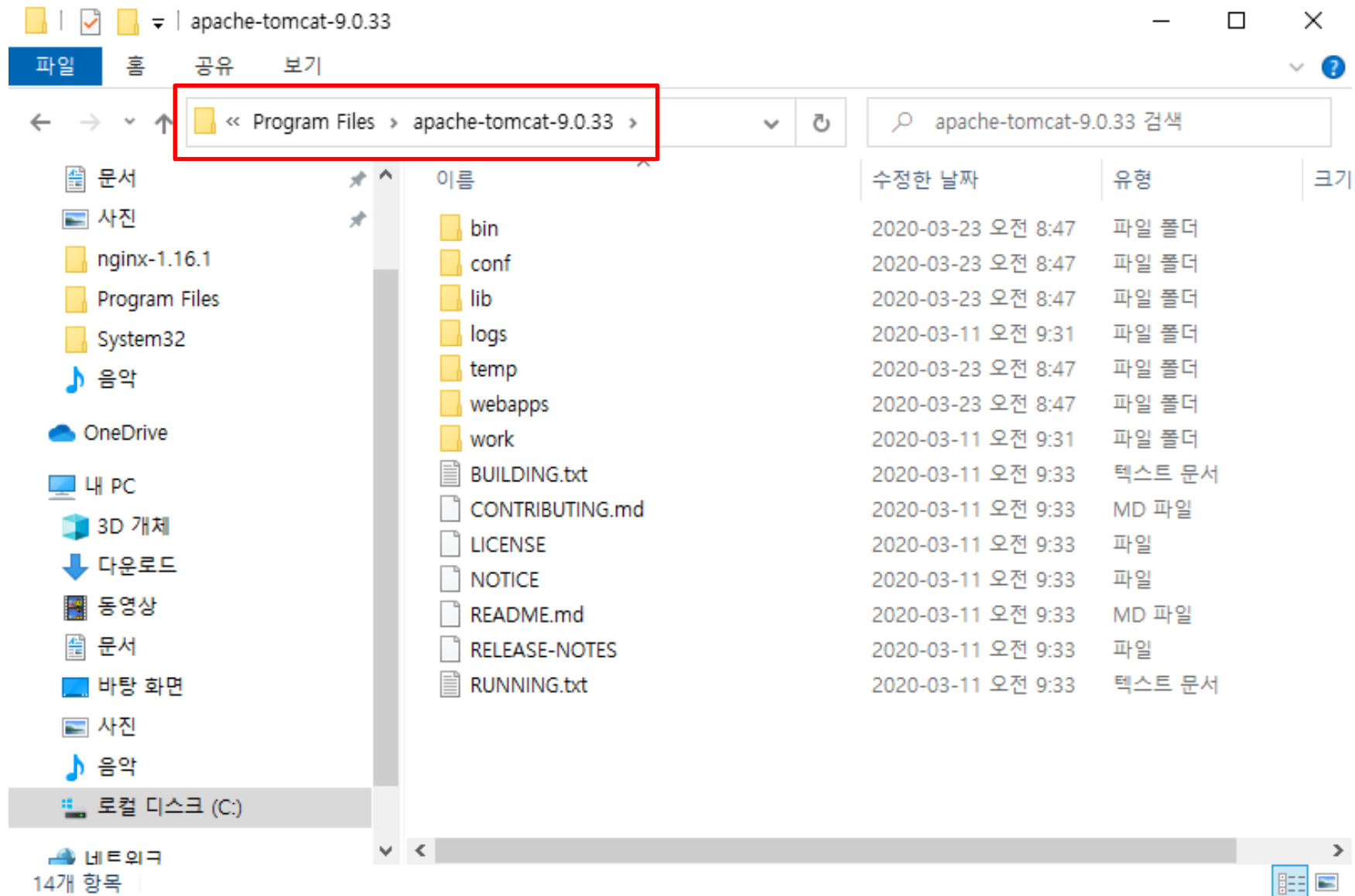
### Binary Distributions

- Core:
  - [zip](#) (pgp, sha512)
  - [tar.gz](#) (pgp, sha512)
  - [32-bit Windows zip](#) (pgp, sha512)
  - [64-bit Windows zip](#) (pgp, sha512)**
  - [32-bit/64-bit Windows Service Installer](#) (pgp, sha512)
- Full documentation:
  - [tar.gz](#) (pgp, sha512)
- Deployer:
  - [zip](#) (pgp, sha512)
  - [tar.gz](#) (pgp, sha512)
- Embedded:
  - [tar.gz](#) (pgp, sha512)
  - [zip](#) (pgp, sha512)

### Source Code Distributions

[apache.tt.co.kr/tomcat/tomcat-9/v9.0.33/bin/apache-tomcat-9.0.33-windows-x64.zip](http://apache.tt.co.kr/tomcat/tomcat-9/v9.0.33/bin/apache-tomcat-9.0.33-windows-x64.zip)

# Tomcat Installation (Cont.)



# Tomcat Installation (Cont.)

새 시스템 변수

변수 이름(N):

CATALINA\_HOME

변수 값(V):

C:\Program Files\apache-tomcat-9.0.33

디렉터리 찾기(D)...

파일 찾기(F)...

확인

취소

환경 변수 편집

✕

%JAVA\_HOME%\bin

%CATALINA\_HOME%\bin

%ORACLE\_HOME%\bin

%M2\_HOME%\bin

C:\Program Files (x86)\Intel\iCLS Client\

C:\Program Files\Intel\iCLS Client\

%SystemRoot%\system32

%SystemRoot%

%SystemRoot%\System32\Wbem

%SYSTEMROOT%\System32\WindowsPowerShell\v1.0\

C:\Program Files (x86)\Intel\Intel(R) Management Engine Compon...

C:\Program Files\Intel\Intel(R) Management Engine Components\...

C:\Program Files (x86)\Intel\Intel(R) Management Engine Compon...

C:\Program Files\Intel\Intel(R) Management Engine Components\...

%SYSTEMROOT%\System32\OpenSSH\

C:\Program Files\Microsoft VS Code\bin

C:\Program Files\dotnet\

새로 만들기(N)

편집(E)

찾아보기(B)...

삭제(D)

위로 이동(U)

아래로 이동(O)

텍스트 편집(T)...

확인

취소

# Tomcat Installation (Cont.)

C:\Windows\system32\cmd.exe

```
Microsoft Windows [Version 10.0.18363.720]
(c) 2019 Microsoft Corporation. All rights reserved.
```

```
C:\Users\Instructor>set CATALINA_HOME
CATALINA_HOME=C:\Program Files\apache-tomcat-9.0.33
```

선택 C:\Windows\system32\cmd.exe

```
Microsoft Windows [Version 10.0.18363.720]
(c) 2019 Microsoft Corporation. All rights reserved.
```

```
C:\Users\Instructor>set PATH
Path=C:\Program Files\Java\jdk-13.0.2\bin;C:\Program Files\apache-maven-3.6.3\bin;C:\Windows\system32;C:\Windows;C:\Windows\System32\Wbem;C:\Windows\System32\WindowsPowerShell\v1.0\;C:\Windows\System32\OpenSSH\;C:\Program Files\apache-tomcat-9.0.33\bin;C:\Users\Instructor\AppData\Local\Microsoft\WindowsApps;C:\Program Files\Bandizip\
PATHEXT=.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC
```

# Tomcat Configuration

C:\Windows\system32\cmd.exe

Microsoft Windows [Version 10.0.18363.720]  
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\Instructor>startup.bat

Using CATALINA\_BASE: "C:\Program Files\

Using CATALINA\_HOME: "C:\Program Files\

Using CATALINA\_TMPDIR: "C:\Program Files\

Using JRE\_HOME: "C:\Program Files\

Using CLASSPATH: "C:\Program Files\

p.jar;C:\Program Files\apache-tomcat-9.0.33\

C:\Users\Instructor>

Tomcat

23-Mar-2020 09:58:23.352 INFO [main] org.apache.catalina.core.AprLifecycleListener.initializeSSL OpenSSL???깃났?곡송濡?  
???렐?렐?렐?렐?렐? [OpenSSL 1.1.1c 28 May 2019]

23-Mar-2020 09:58:24.119 INFO [main] org.apache.coyote.AbstractProtocol.init ?꼰쥬?쥬쥬 ?멧뵈?["http-nio-8080"]??瑜? 珙  
렐?렐?렐?렐?렐?

23-Mar-2020 09:58:24.510 INFO [main] org.apache.coyote.AbstractProtocol.init ?꼰쥬?쥬쥬 ?멧뵈?["http-nio-8080"]??瑜? 珙  
렐?렐?렐?렐?렐?

23-Mar-2020 09:58:24.695 INFO [main] org.apache.coyote.AbstractProtocol.init ?꼰쥬?쥬쥬 ?멧뵈?["http-nio-8080"]??瑜? 珙  
렐?렐?렐?렐?렐?

23-Mar-2020 09:58:24.695 INFO [main] org.apache.coyote.AbstractProtocol.init ?꼰쥬?쥬쥬 ?멧뵈?["http-nio-8080"]??瑜? 珙  
렐?렐?렐?렐?렐?

23-Mar-2020 09:58:24.739 INFO [main] org.apache.coyote.AbstractProtocol.init ?꼰쥬?쥬쥬 ?멧뵈?["http-nio-8080"]??瑜? 珙  
렐?렐?렐?렐?렐?


23-Mar-2020 09:58:25.460 INFO [main] org.apache.coyote.AbstractProtocol.init ?꼰쥬?쥬쥬 ?멧뵈?["http-nio-8080"]??瑜? 珙  
렐?렐?렐?렐?렐?

23-Mar-2020 09:58:25.460 INFO [main] org.apache.coyote.AbstractProtocol.init ?꼰쥬?쥬쥬 ?멧뵈?["http-nio-8080"]??瑜? 珙  
렐?렐?렐?렐?렐?

Windows 보안 경고

Windows Defender 방화벽에서 이 앱의 일부 기능을 차단했습니다.

모든 공용 네트워크 및 개인 네트워크에서 Windows Defender 방화벽이 OpenJDK Platform binary의 일부 기능을 차단했습니다.

 이름(N): **OpenJDK Platform binary**  
게시자(P): Oracle Corporation  
경로(H): C:\program files\java\jdk-13.0.2\bin\java.exe

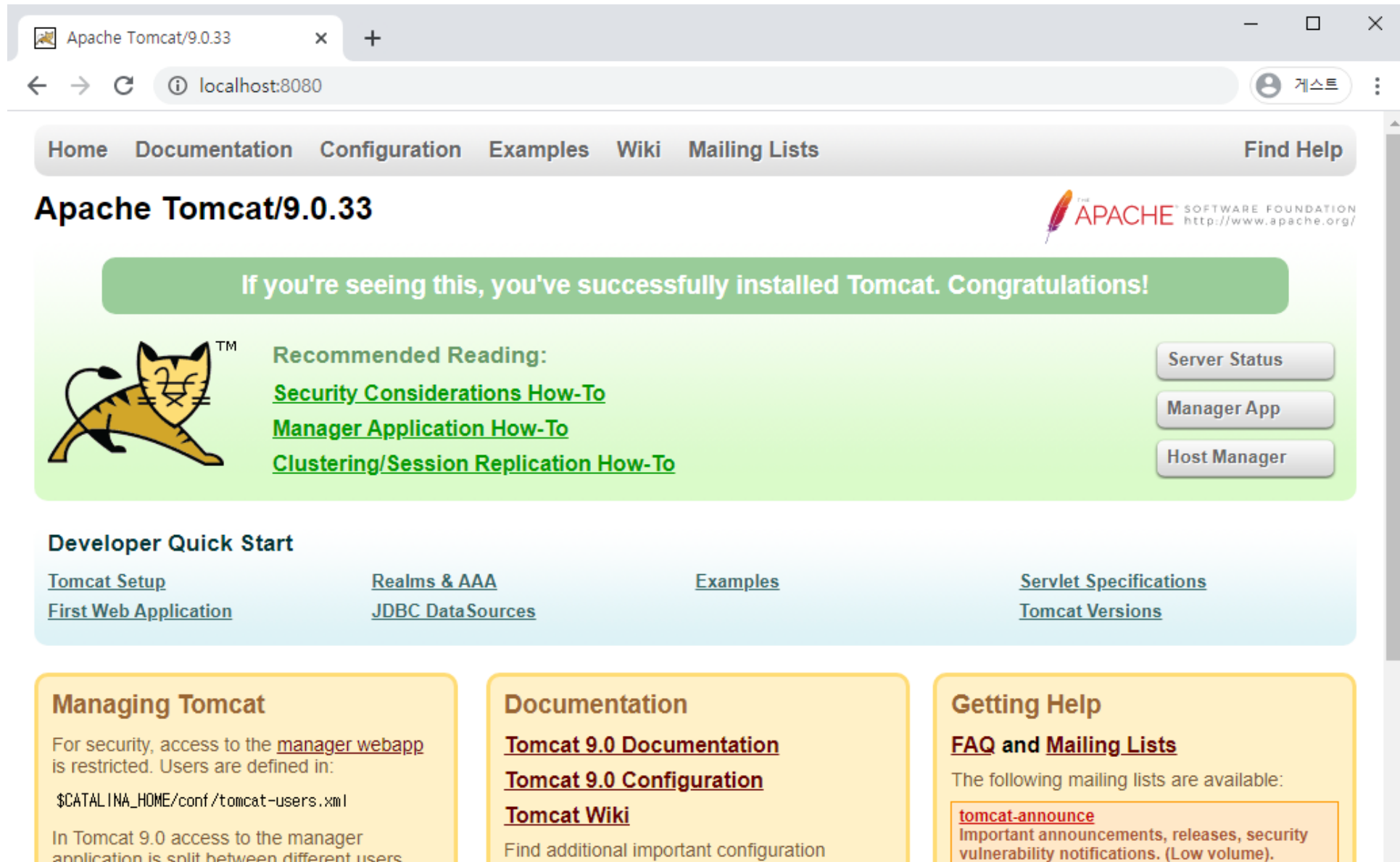
다음 네트워크에서 OpenJDK Platform binary의 통신 허용:

☐ 홈 네트워크, 회사 네트워크 등의 개인 네트워크(R)

☒ 공항, 커피숍 등의 공용 네트워크(U)(공용 네트워크는 보안 수준이 낮거나 보안 기술이 적용되지 않은 경우가 많으므로 권장되지 않음)

[방화벽을 통한 앱 액세스 허용의 위험성](#)

# Tomcat Configuration (Cont.)



The screenshot shows a web browser window with the Apache Tomcat/9.0.33 interface. The browser's address bar shows 'localhost:8080'. The page has a navigation bar with links: Home, Documentation, Configuration, Examples, Wiki, Mailing Lists, and a 'Find Help' button. The main heading is 'Apache Tomcat/9.0.33'. A green banner states: 'If you're seeing this, you've successfully installed Tomcat. Congratulations!'. Below this, on the left, is the Tomcat logo (a cat). To the right of the logo, under 'Recommended Reading:', are three links: 'Security Considerations How-To', 'Manager Application How-To', and 'Clustering/Session Replication How-To'. Further right are three buttons: 'Server Status', 'Manager App', and 'Host Manager'. Below the recommended reading section is a 'Developer Quick Start' section with four links: 'Tomcat Setup', 'First Web Application', 'Realms & AAA', 'JDBC DataSources', 'Examples', 'Servlet Specifications', and 'Tomcat Versions'. At the bottom, there are three yellow boxes. The first box, 'Managing Tomcat', contains text about security and a file path: '\$CATALINA\_HOME/conf/tomcat-users.xml'. The second box, 'Documentation', contains links to 'Tomcat 9.0 Documentation', 'Tomcat 9.0 Configuration', and 'Tomcat Wiki', followed by the text 'Find additional important configuration'. The third box, 'Getting Help', contains links to 'FAQ and Mailing Lists' and text about mailing lists, including a link to 'tomcat-announce'.


Apache Tomcat/9.0.33

localhost:8080

Home Documentation Configuration Examples Wiki Mailing Lists Find Help

## Apache Tomcat/9.0.33

If you're seeing this, you've successfully installed Tomcat. Congratulations!



**Recommended Reading:**

- [Security Considerations How-To](#)
- [Manager Application How-To](#)
- [Clustering/Session Replication How-To](#)

Server Status  
Manager App  
Host Manager

### Developer Quick Start

- [Tomcat Setup](#)
- [First Web Application](#)
- [Realms & AAA](#)
- [JDBC DataSources](#)
- [Examples](#)
- [Servlet Specifications](#)
- [Tomcat Versions](#)

#### Managing Tomcat

For security, access to the [manager webapp](#) is restricted. Users are defined in:

```
$CATALINA_HOME/conf/tomcat-users.xml
```

In Tomcat 9.0 access to the manager application is split between different users

#### Documentation

[Tomcat 9.0 Documentation](#)  
[Tomcat 9.0 Configuration](#)  
[Tomcat Wiki](#)

Find additional important configuration

#### Getting Help

[FAQ and Mailing Lists](#)

The following mailing lists are available:

- [tomcat-announce](#)  
Important announcements, releases, security vulnerability notifications. (Low volume).



# Tomcat Configuration (Cont.)

## ■ %CATALINA\_HOME%/conf/tomcat-users.xml

```
23  NOTE: By default, no user is included in the "manager-gui" role required
24  to operate the "/manager/html" web application. If you wish to use this app,
25  you must define such a user - the username and password are arbitrary. It is
26  strongly recommended that you do NOT use one of the users in the commented out
27  section below since they are intended for use with the examples web
28  application.
29  >
30  <user username="admin" password="tomcatadmin" roles="admin-gui,manager-gui"/>
31  <!--
32  NOTE: The sample user and role entries below are intended for use with the
33  examples web application. They are wrapped in a comment and thus are ignored
34  when reading this file. If you wish to configure these users for use with the
35  examples web application, do not forget to remove the <!-- ..> that surrounds
36  them. You will also need to set the passwords to something appropriate.
37  -->
```

# Tomcat Configuration (Cont.)

- %CATALINA\_HOME%/webapps/homecontext.xml 생성

```
<Context path="" docBase="C:/SpringHome" debug="0" reloadable="true"  
    crossContext="true" privileged="true" />
```

# Tomcat Configuration (Cont.)

- %CATALINA\_HOME%/webapps/ROOT/WEB-INF 복사
- C:/SpringHome 하위에 붙여넣기
- C:/SpringHome/WEB-INF/web.xml 수정

```
1  <?xml version="1.0" encoding="UTF-8"?>
2  <web-app xmlns="http://xmlns.jcp.org/xml/ns/javaee"
3      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
4      xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
5                          http://xmlns.jcp.org/xml/ns/javaee/web-app_4_0.xsd"
6      version="4.0"
7      metadata-complete="true">
8
9      <display-name>Welcome to Spring Homepage</display-name>
10
11 </web-app>
```

# Tomcat Configuration (Cont.)

## ■ C:/SpringHome/index.html 생성

```
1  <!DOCTYPE html>
2  <html lang="en">
3  <head>
4    <meta charset="UTF-8">
5    <title>Welcome to Spring Homepage</title>
6  </head>
7  <body>
8    <div><span style="font-size:30pt;color:blue">Welcome Spring 5</span></div>
9  </body>
10 </html>
```

# Tomcat Configuration (Cont.)

- [Tomcat Web Application Manager]에서 / Path undeploy

Tomcat 웹 애플리케이션 매니저

메시지: OK

매니저

애플리케이션들의 목록을 표시 HTML 매니저 도움말 매니저 도움말 서버 상태

애플리케이션들

경로	버전	표시 이름	실행 중	세션들	명령들
/	지정 안됨	Welcome to Tomcat	true	0	시작 중지 다시 로드 배치된 것을 제거 세션들을 만료시키기 idle 값 ≥ 30 분
/docs	지정 안됨	Tomcat Documentation	true	0	시작 중지 다시 로드 배치된 것을 제거 세션들을 만료시키기 idle 값 ≥ 30 분
/examples	지정 안됨	Servlet and JSP Examples	true	0	시작 중지 다시 로드 배치된 것을 제거 세션들을 만료시키기 idle 값 ≥ 30 분
/host-manager	지정 안됨	Tomcat Host Manager Application	true	0	시작 중지 다시 로드 배치된 것을 제거

# Tomcat Configuration (Cont.)

## ■ [Tomcat Web Application Manager]에서 / Path deploy

- Context Path : /

- XML Configuration file path :

**C:\Program Files\apache-tomcat-9.0.33\webapps\homecontext.xml**

배치	
서버에 있는 디렉토리 또는 WAR 파일을 배치합니다.	
컨텍스트 경로:	<input type="text" value="/"/>
버전 (병렬 배치용):	<input type="text"/>
XML 설정 파일 경로:	<input type="text" value="/webapps/homecontext.xml"/>
WAR 또는 디렉토리 경로:	<input type="text"/>
<input type="button" value="배치"/>	

# Tomcat Configuration (Cont.)

- [Tomcat Web Application Manager]에서 / Path deploy

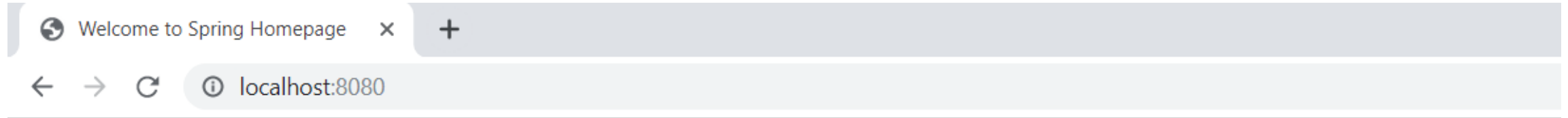
The screenshot shows the Tomcat Web Application Manager interface in a web browser. The browser address bar shows the URL: `localhost:8080/manager/html/deploy?org.apache.catalina.filters.CSRF_NONCE=71AB811229365A3BE201E8A5...`. The page title is "Tomcat 웹 애플리케이션 매니저". Below the title, there is a message box that says: "메시지: OK - 컨텍스트 경로 [/]에 애플리케이션을 배치했습니다." (Message: OK - Application deployed to context path [/]).

The main content area is titled "매니저" (Manager) and contains a table with the following columns: "애플리케이션들의 목록을 표시" (Display application list), "HTML 매니저 도움말" (HTML Manager Help), "매니저 도움말" (Manager Help), and "서버 상태" (Server Status).

Below this, there is a table titled "애플리케이션들" (Applications) with the following columns: "경로" (Path), "버전" (Version), "표시 이름" (Display Name), "실행 중" (Running), "세션들" (Sessions), and "명령들" (Commands). The first row in this table is highlighted with a red border, indicating the newly deployed application at the root path.

경로	버전	표시 이름	실행 중	세션들	명령들
/	지정 안됨	Welcome to Spring Homepage.	true	0	시작 중지 다시 로드 배치된 것을 제거 세션들을 만료시키기 idle 값 ≥ 30 분
/docs	지정 안됨	Tomcat Documentation	true	0	시작 중지 다시 로드 배치된 것을 제거 세션들을 만료시키기 idle 값 ≥ 30 분
/examples	지정 안됨	Servlet and JSP Examples	true	0	시작 중지 다시 로드 배치된 것을 제거 세션들을 만료시키기 idle 값 ≥ 30 분
/host-manager	지정 안됨	Tomcat Host Manager Application	true	0	시작 중지 다시 로드 배치된 것을 제거

# Tomcat Configuration (Cont.)



Welcome Spring 5



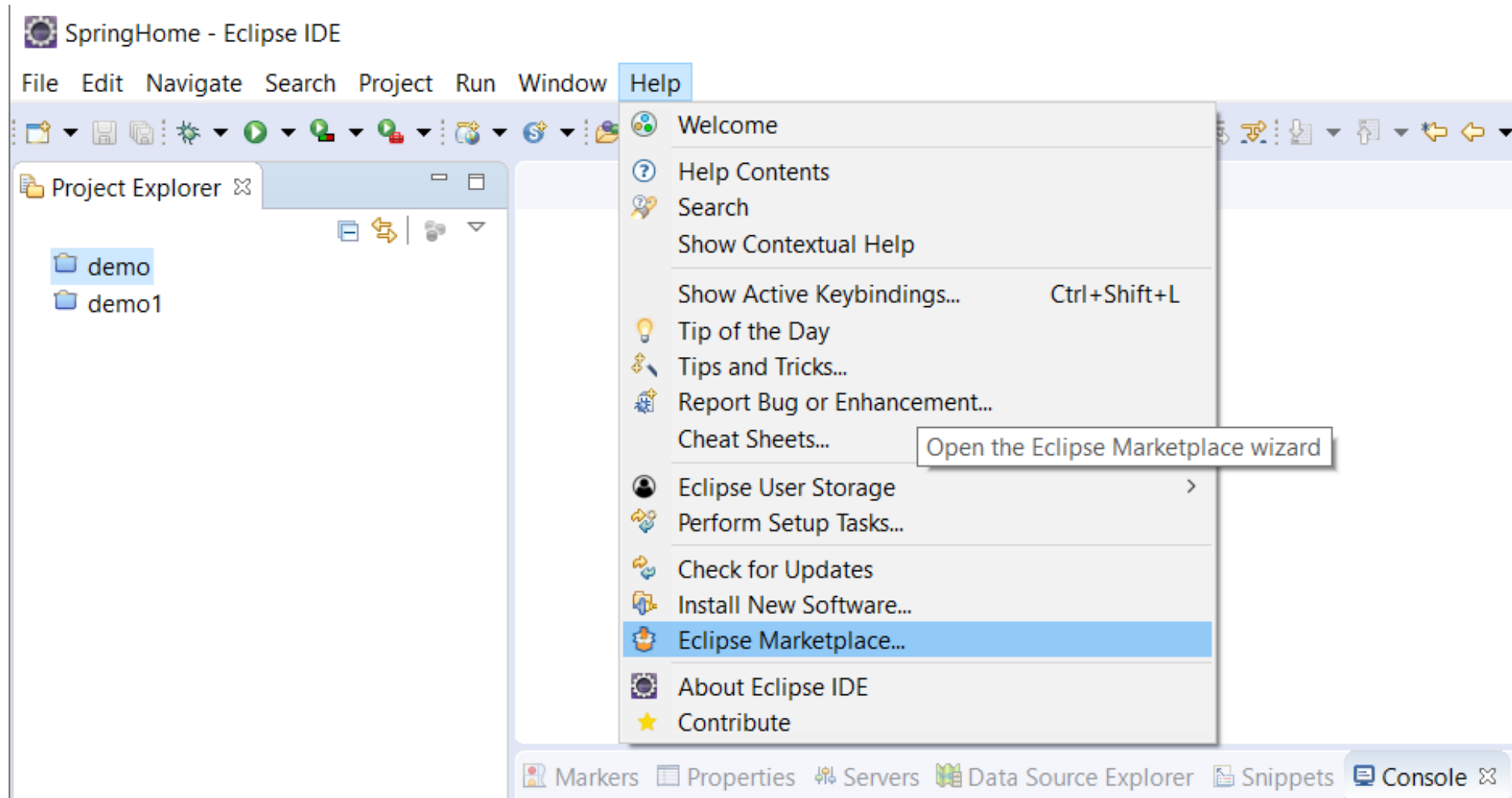


---

# VI. STS 4.6.0.RELEASE



# STS Downloads



# STS Downloads (Cont.)

Eclipse Marketplace


Select solutions to install. Press Install Now to proceed with installation.  
Press the "more info" link to learn more about a solution.

Search Recent Popular Favorites Installed Giving IoT an Edge

Find: STS All Markets All Categories Go

★ 34 Installs: 46.8K (8,346 last month) Install


**Spring Tools 4 (aka Spring Tool Suite 4)**  
**4.6.0.RELEASE**

 Spring Tools 4 is the next generation of Spring Boot tooling for your favorite coding environment. Largely rebuilt from scratch, it provides world-class support... [more info](#)

by Pivotal, EPL  
[spring](#) [Spring IDE](#) [Cloud](#) [Spring Tool Suite](#) [STS](#) ...

★ 2440 Installs: 1.47M (31,656 last month) Install


**Minimalist Gradle Editor 1.0.1**

 <https://github.com/Nodeclipse/GradleEditor> Minimalist Gradle Editor for build.gradle files with highlight for keywords, strings and matching brackets and android... [more info](#)

by Nodeclipse/Enide, GPL  
[gradle editor](#) [highlight](#) [build](#) [android](#) ...

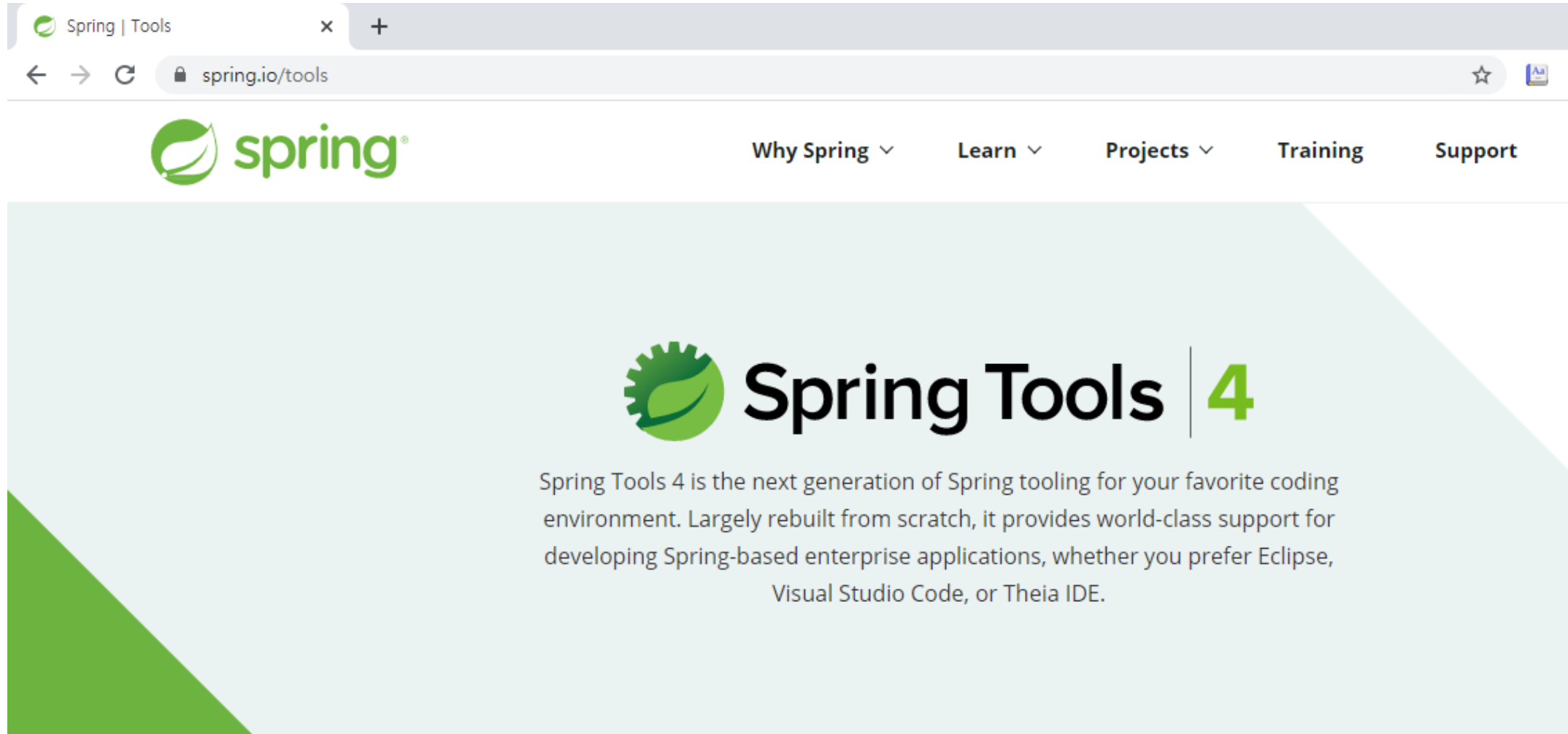
★ 93 Installs: 78.0K (502 last month) Install

Marketplaces



# STS Downloads (Cont.)

- <https://spring.io/tools>



# STS Downloads (Cont.)

- <https://spring.io/tools>

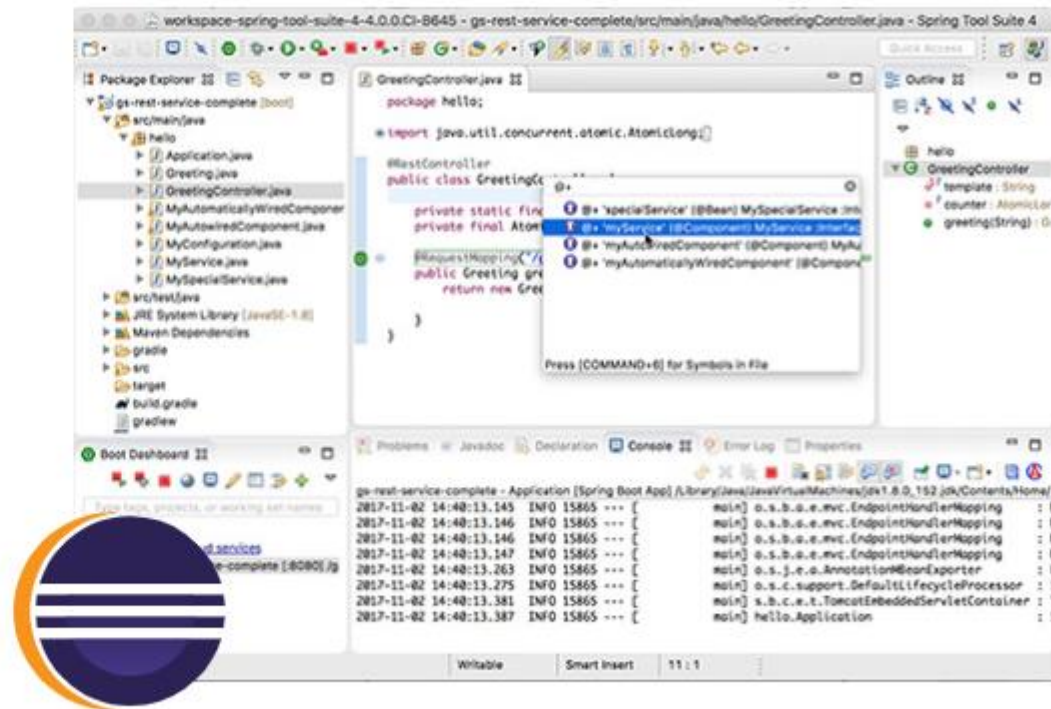
## Spring Tools 4 for Eclipse

The all-new Spring Tool Suite 4.  
Free. Open source.

LINUX 64-BIT

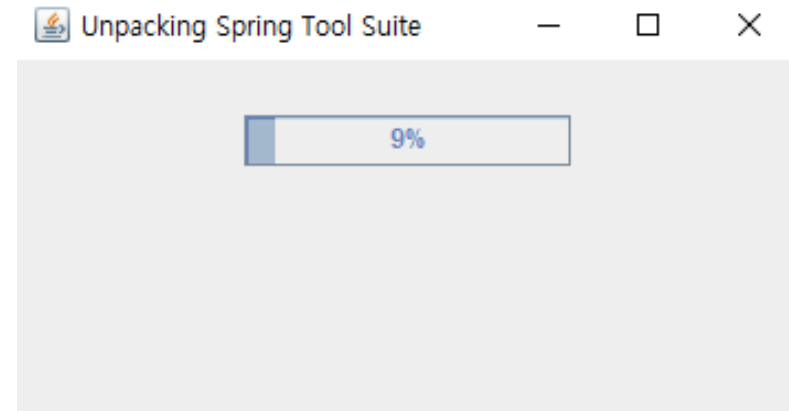
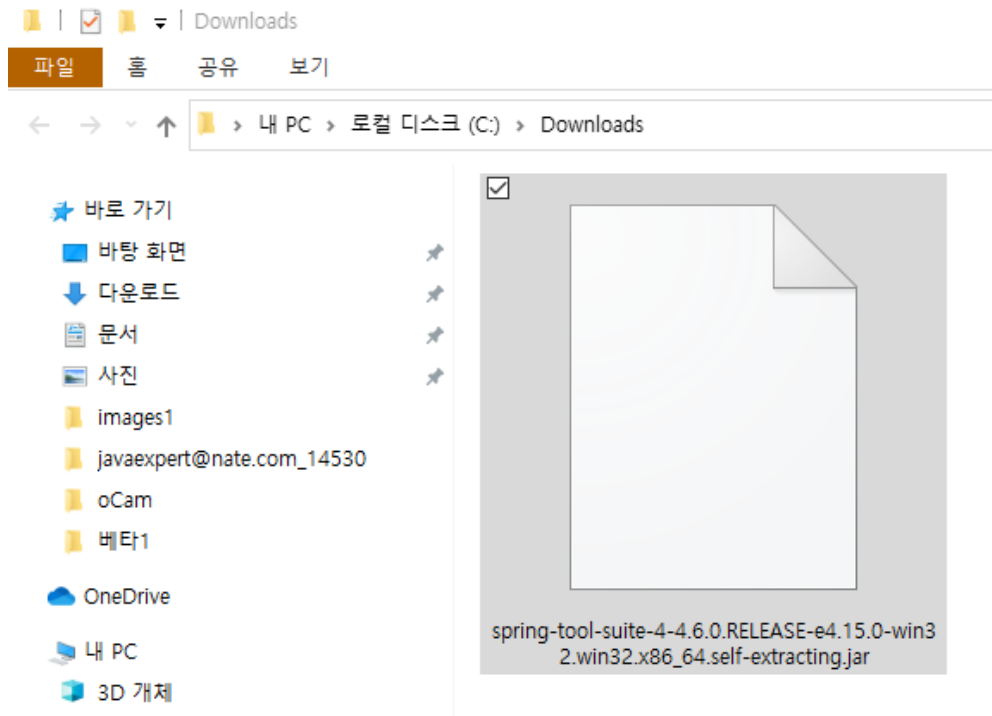
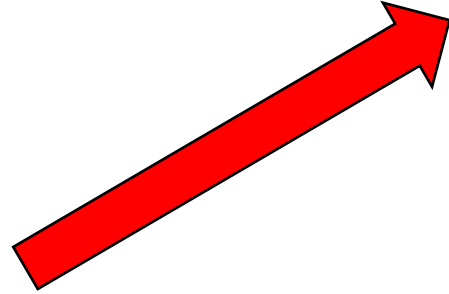
MACOS 64-BIT

WINDOWS 64-BIT

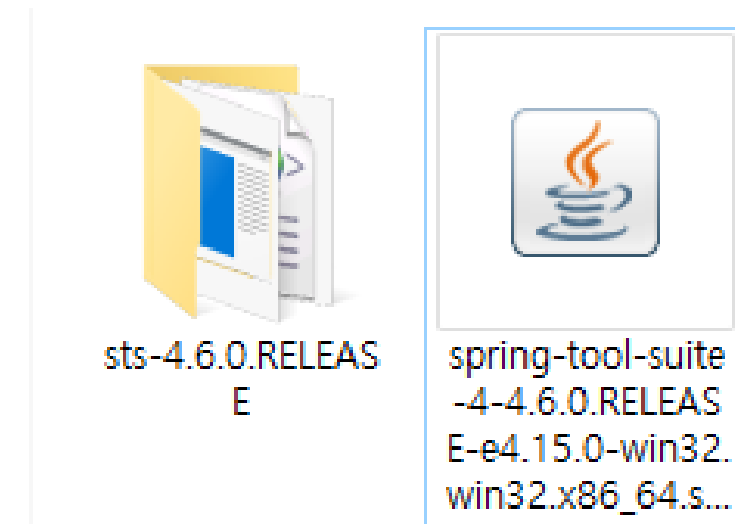


# STS Downloads (Cont.)

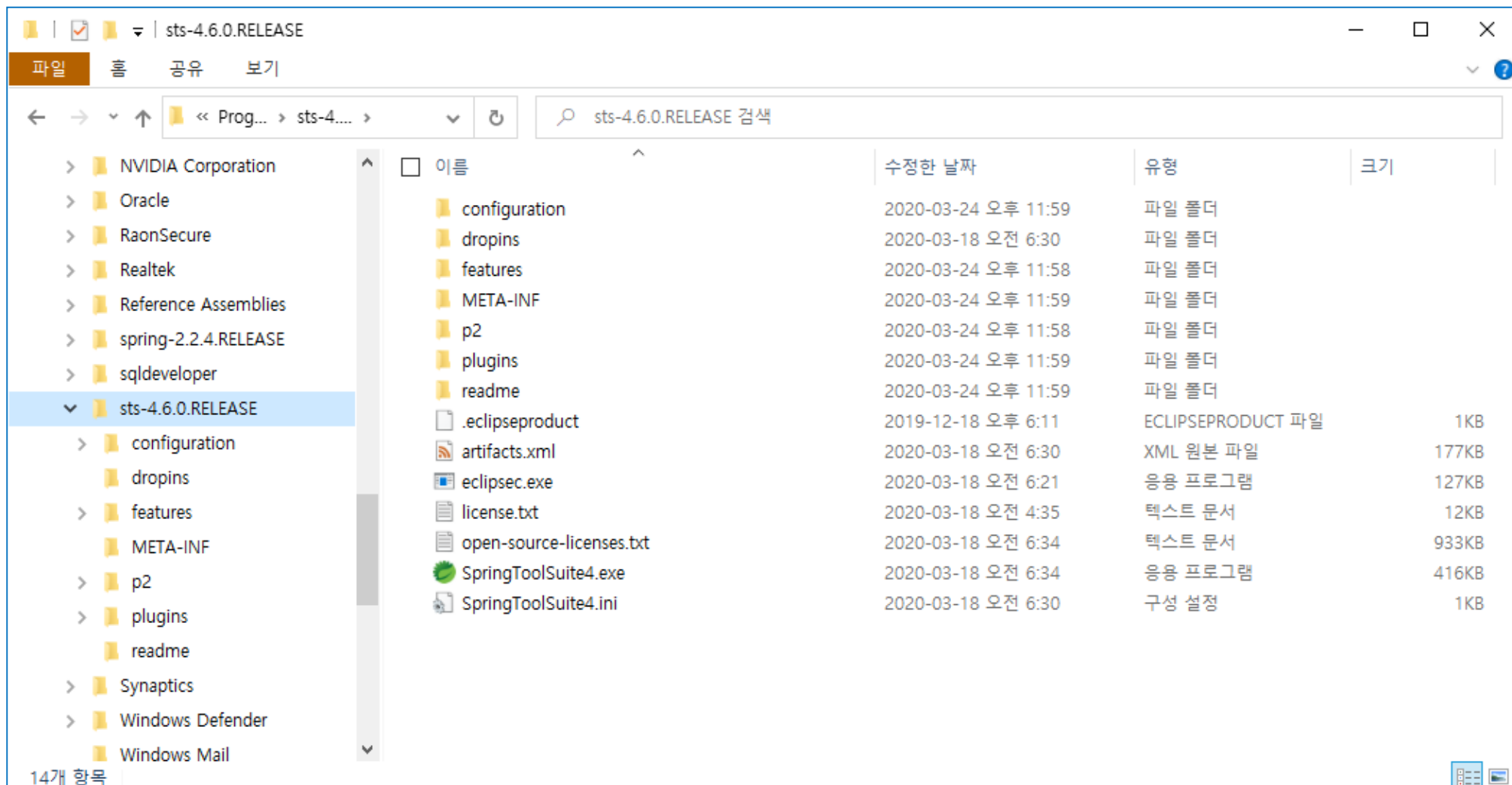
- Double-click to unzip



디스크 (C:) > temp >



# STS Configuration



# STS Configuration

×

← 바로 가기 만들기

바로 가기를 만들 항목을 선택하십시오.

이 마법사는 로컬 또는 네트워크상에 있는 프로그램, 파일, 폴더, 컴퓨터, 인터넷 주소의 바로 가기를 만들 수 있도록 도와줍니다.

항목 위치 입력(T):  
"C:\Program Files\sts-4.6.0.RELEASE\SpringToolSuite4.exe"

찾아보기(R)...

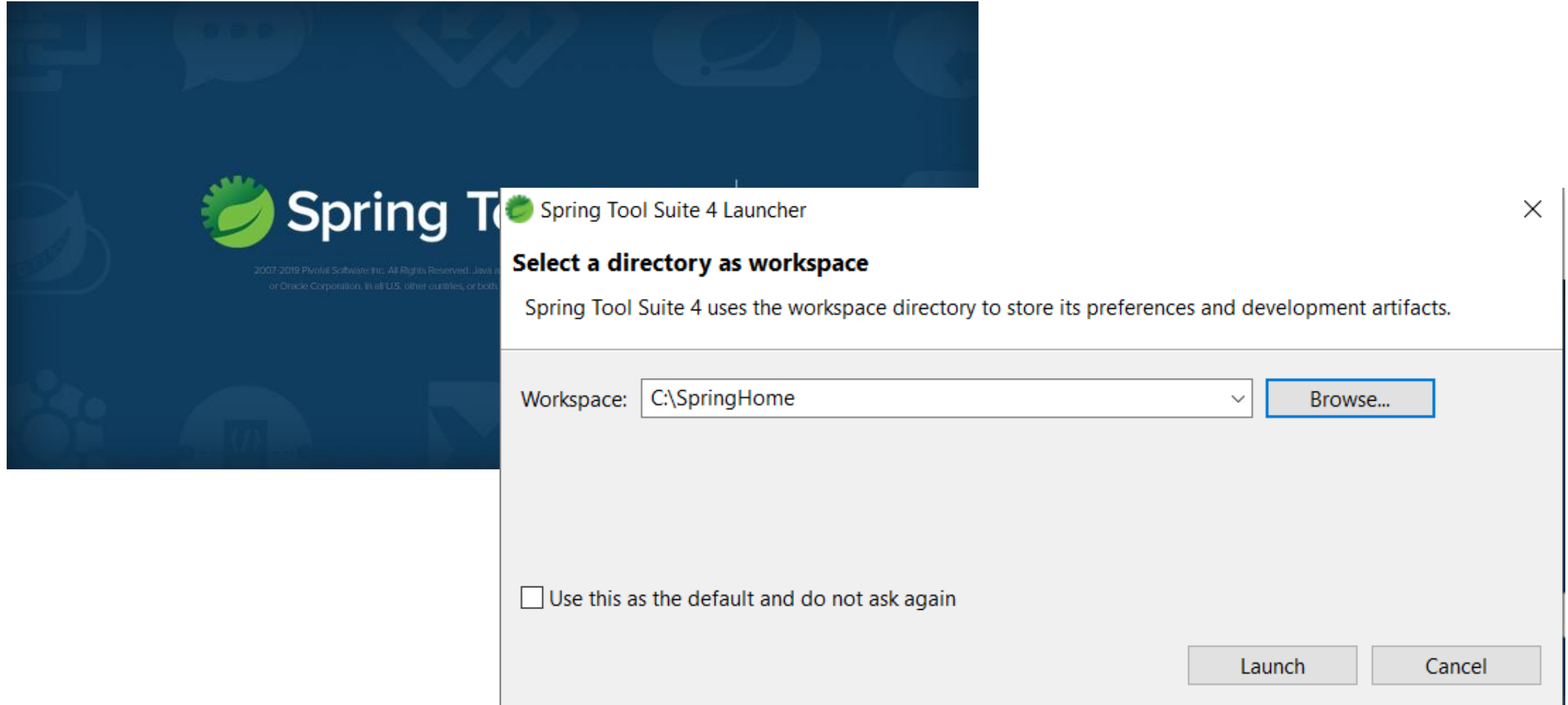
계속 진행하려면 [다음]을 클릭하십시오.

다음(N)

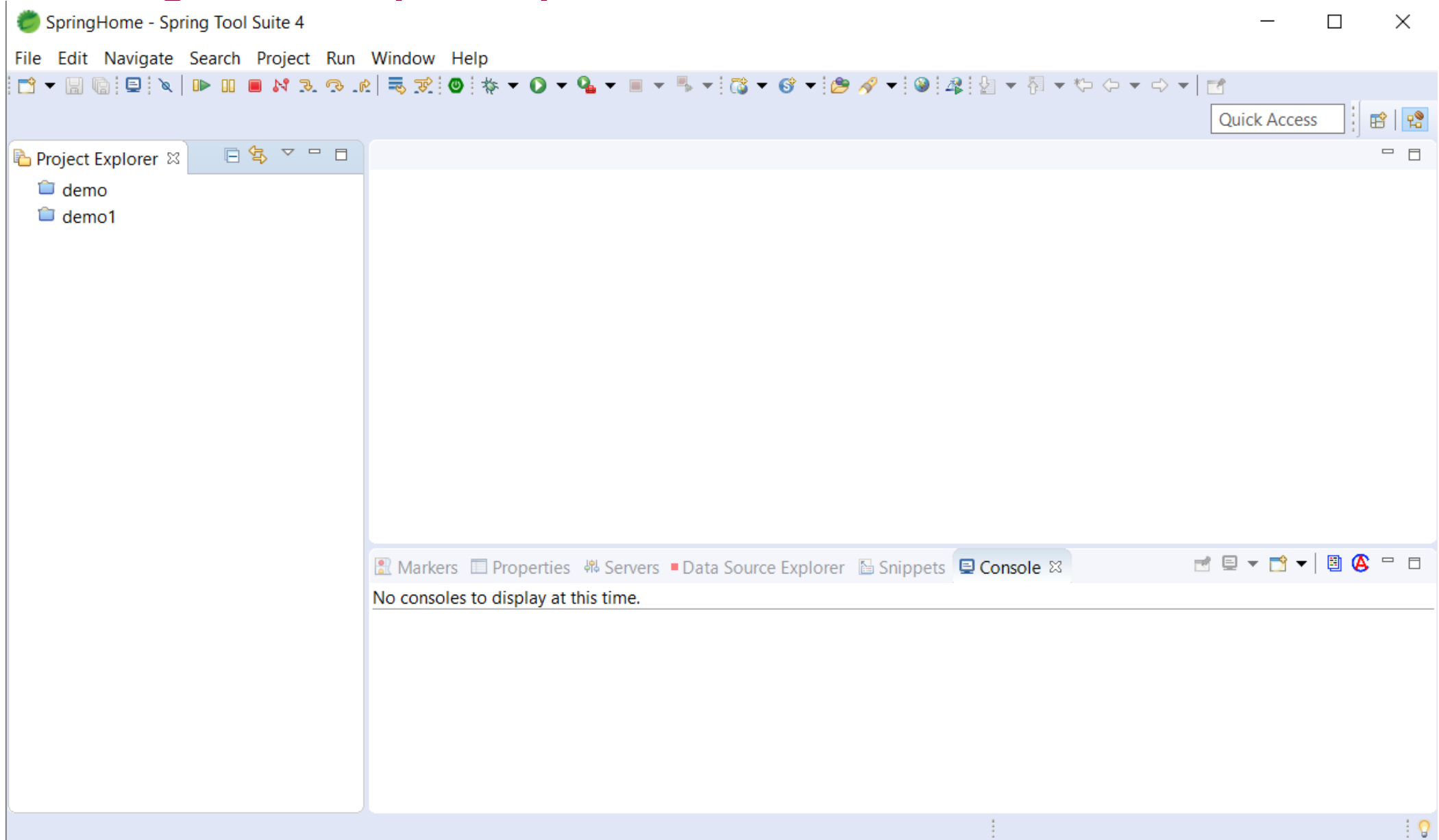
취소



# STS Configuration

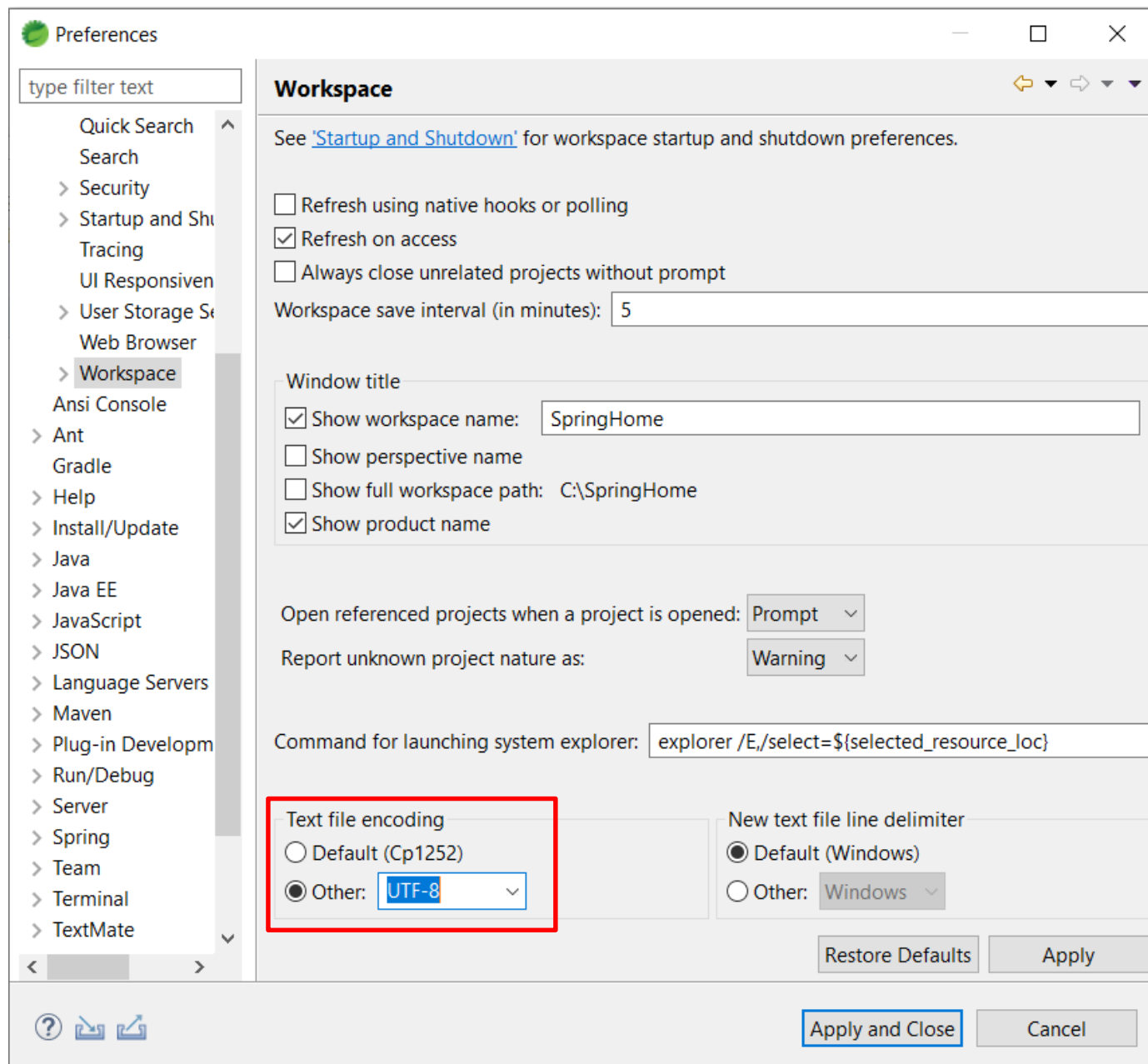


# STS Configuration (Cont.)

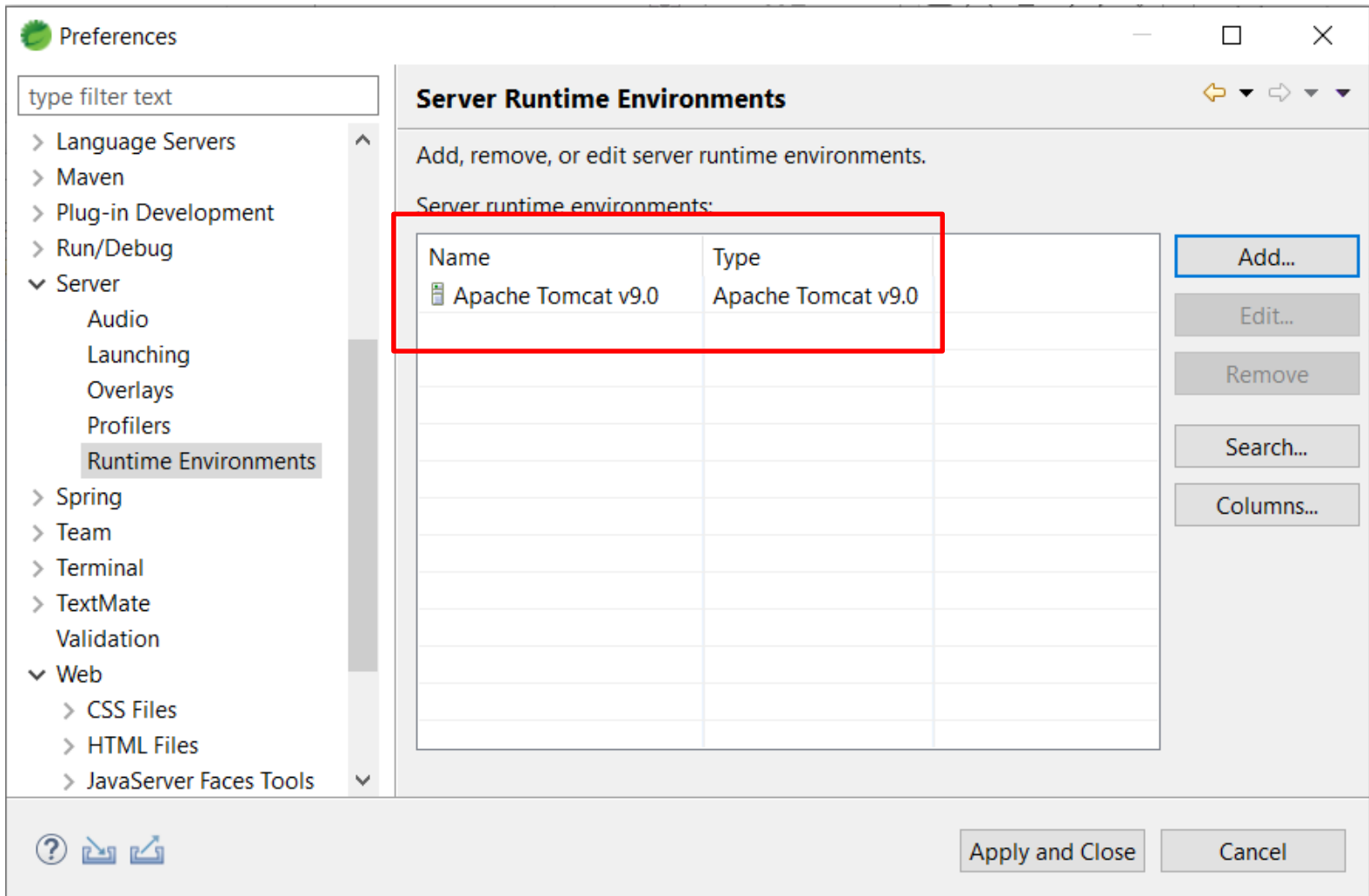


# STS Configuration (Cont.)

## ■ Workspace의 UTF-8 설정하기

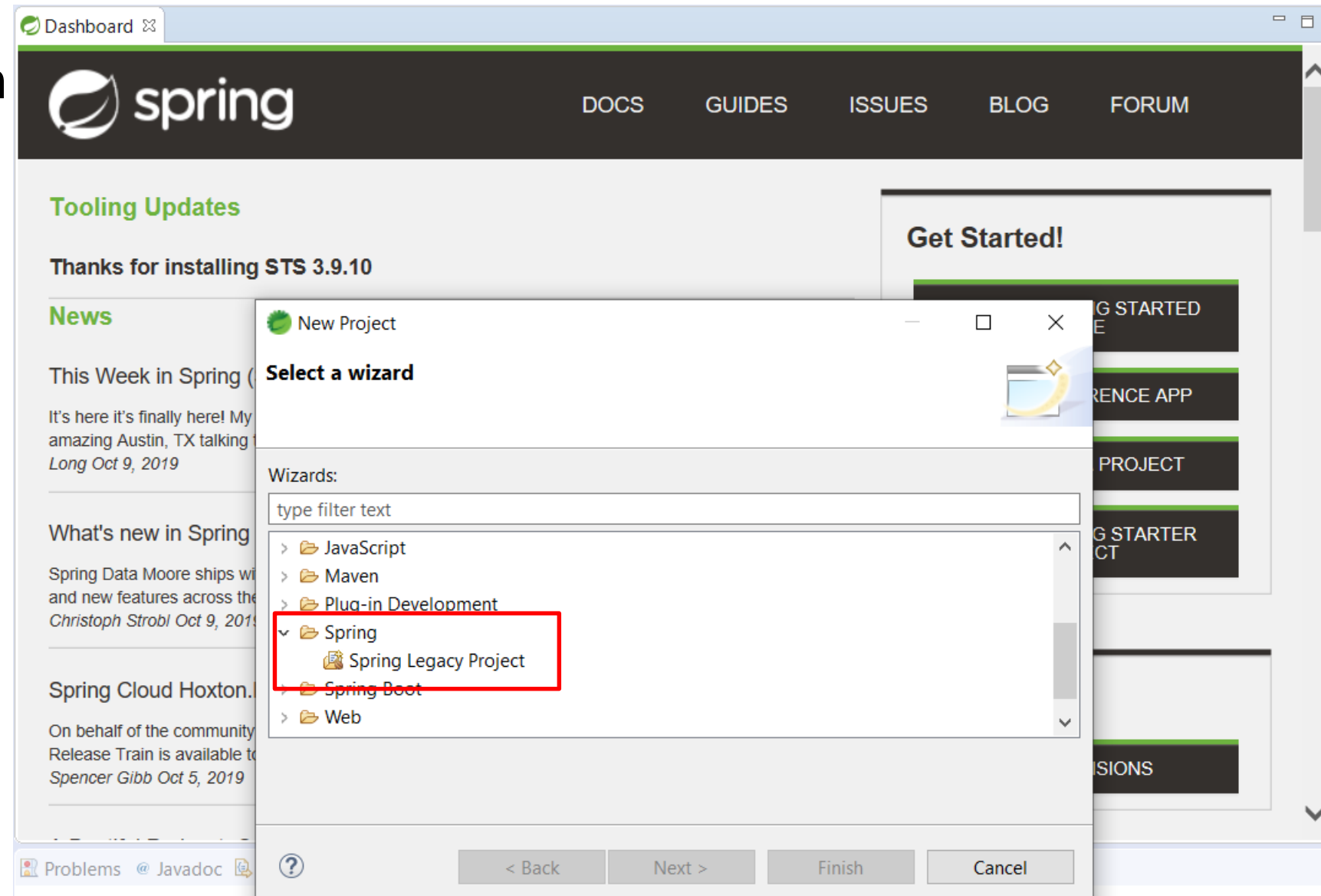


## ■ STS4에 Tomcat 등록하기



# STS Configuration (Cont.)

- STS4에 STS3 Add-On Installation



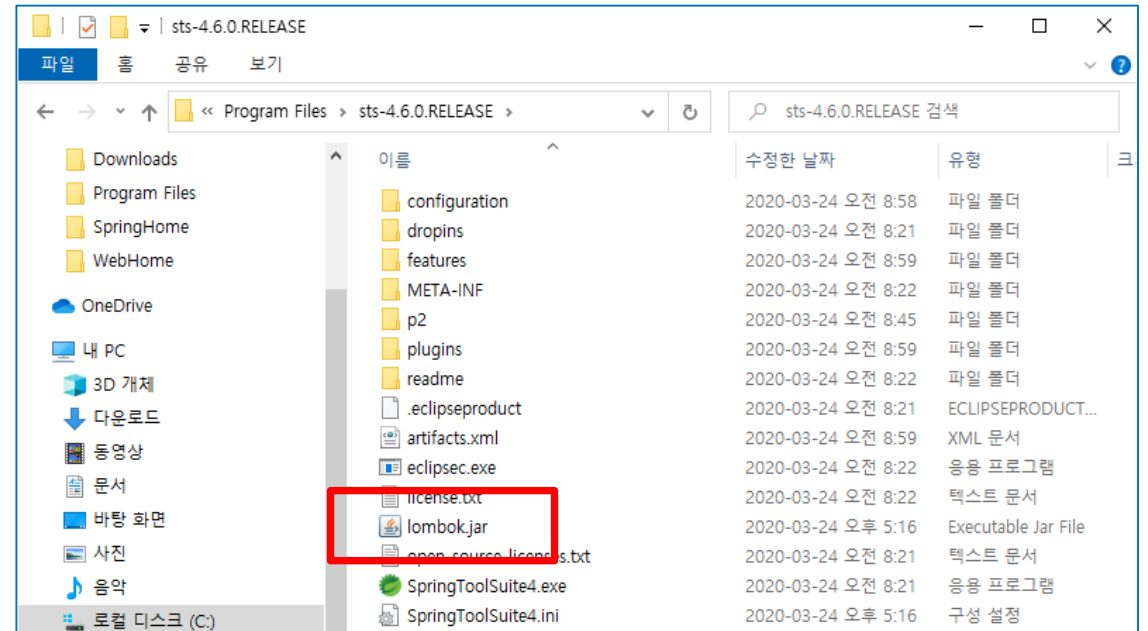
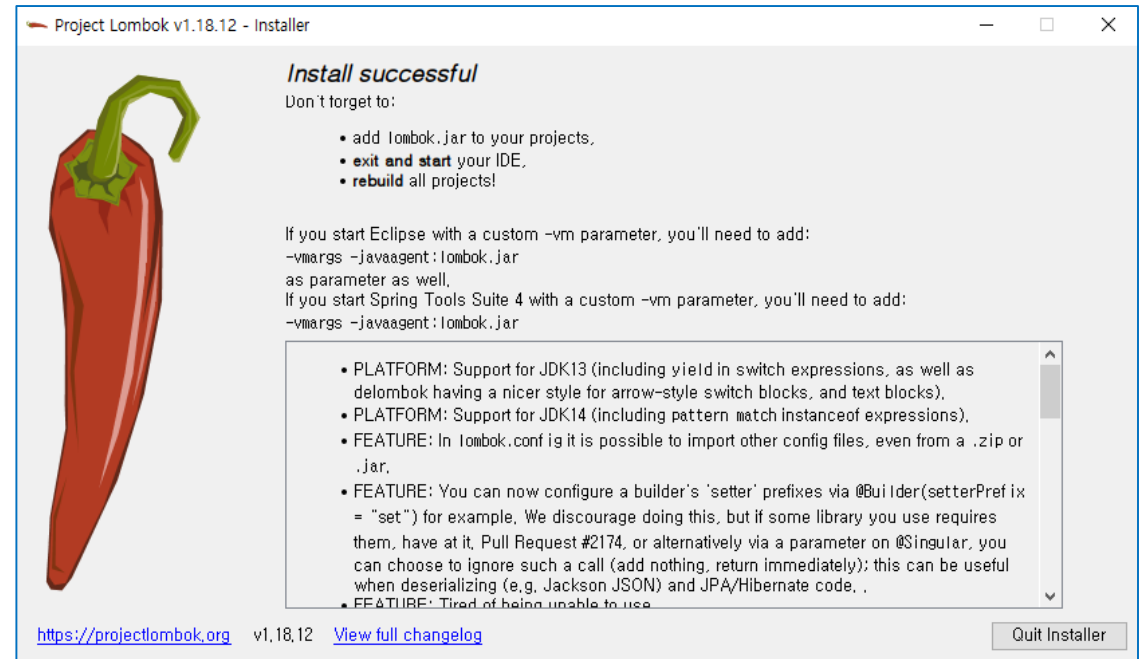
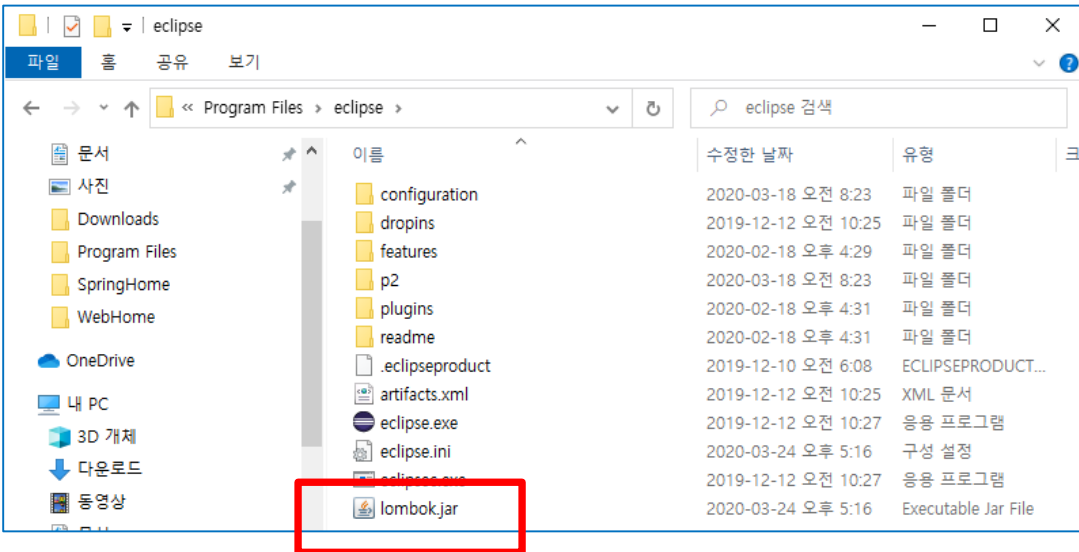
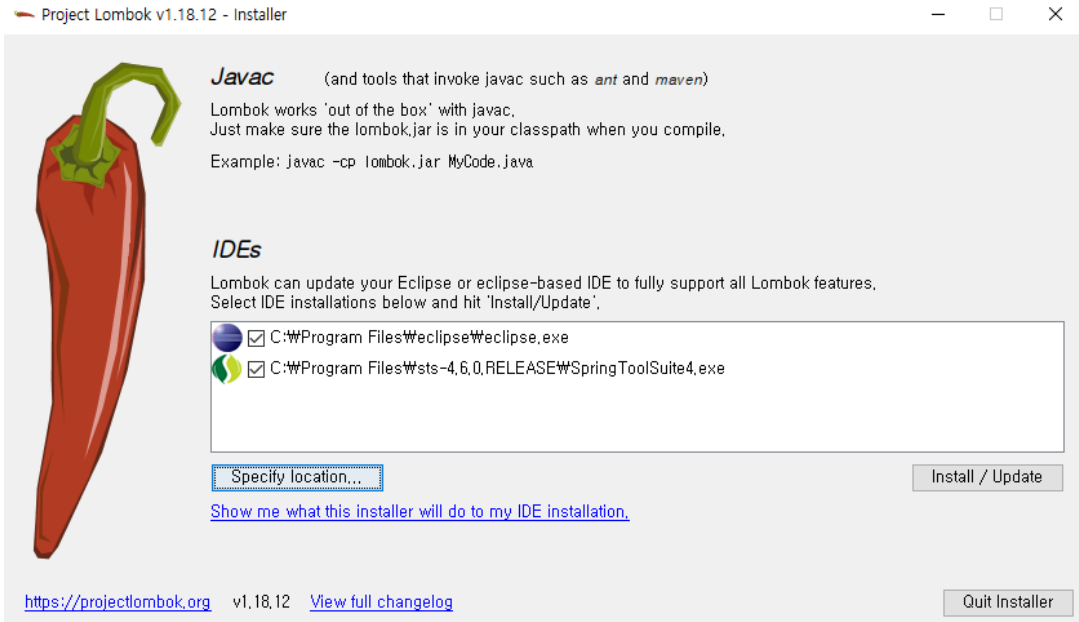


---

## **VII. Lombok v1.18.12**



# Lombok Installation





---

# Spring Web MVC Demo Project





# Spring Web MVC Demo Project

SpringHome - http://localhost:8080/demo/ - Spring Tool Suite 4

File Edit Navigate Search Project Run Window Help

Package Explorer

- HelloWorld
- Servers
- Test
  - src/main/java
  - src/main/resources
  - src/test/java
  - src/test/resources
  - Maven Dependencies
  - Apache Tomcat v9.0 [Apache]
  - JRE System Library [jdk1.8.0\_21]
  - src
  - target
  - pom.xml

Test/pom.xml Home

http://localhost:8080/demo/

## Hello world!

The time on the server is 2019-10-10 11:57:23.

Problems Javadoc Declaration Console Progress

Tomcat v9.0 Server at localhost [Apache Tomcat] C:\Program Files\Java\jdk1.8.0\_221\bin\javaw.exe (Oct 10, 2019, 11:57:20 PM)

```
INFO: At least one JAR was scanned for TLDs yet contained no TLDs. Enable debug logging for this logger for a full log message.
Oct 10, 2019 11:57:23 PM org.apache.catalina.core.ApplicationContext log
INFO: Initializing Spring root WebApplicationContext
INFO : org.springframework.web.context.ContextLoader - Root WebApplicationContext: initialization started
INFO : org.springframework.web.context.ContextLoader - Root WebApplicationContext: initialization completed
Oct 10, 2019 11:57:23 PM org.apache.catalina.core.ApplicationContext log
INFO: Initializing Spring DispatcherServlet 'appServlet'
INFO : org.springframework.web.servlet.mvc.annotation.AnnotationMethodMapping - Initializing Servlet 'appServlet'
INFO : org.springframework.web.servlet.mvc.annotation.AnnotationMethodMapping - Completed initialization in 786 ms
Oct 10, 2019 11:57:24 PM org.apache.coyote.AbstractProtocol start
INFO: Starting ProtocolHandler ["http-nio-8080"]
Oct 10, 2019 11:57:24 PM org.apache.coyote.AbstractProtocol start
INFO: Starting ProtocolHandler ["ajp-nio-8009"]
Oct 10, 2019 11:57:24 PM org.apache.catalina.startup.Catalina start
INFO: Server startup in [2,510] milliseconds
INFO : com.example.demo.HomeController - Welcome home! The client locale is ko.
```

Boot Dashboard

Type tags, projects, or working set name

- local

Done