

UNIT 1

Introducing Spring Boot

Spring Boot Quick Start

Java Brains

javaBrains.io



Spring Boot Quick Start

Spring Framework

Java Brains
javabrains.io



In this course

- What is Spring Boot?
- Building an end to end app
- Spring Boot Features
- Configuration and Customization

What is Spring Boot?

Spring Boot makes it easy to create stand-alone, production-grade Spring based Applications that you can "just run".

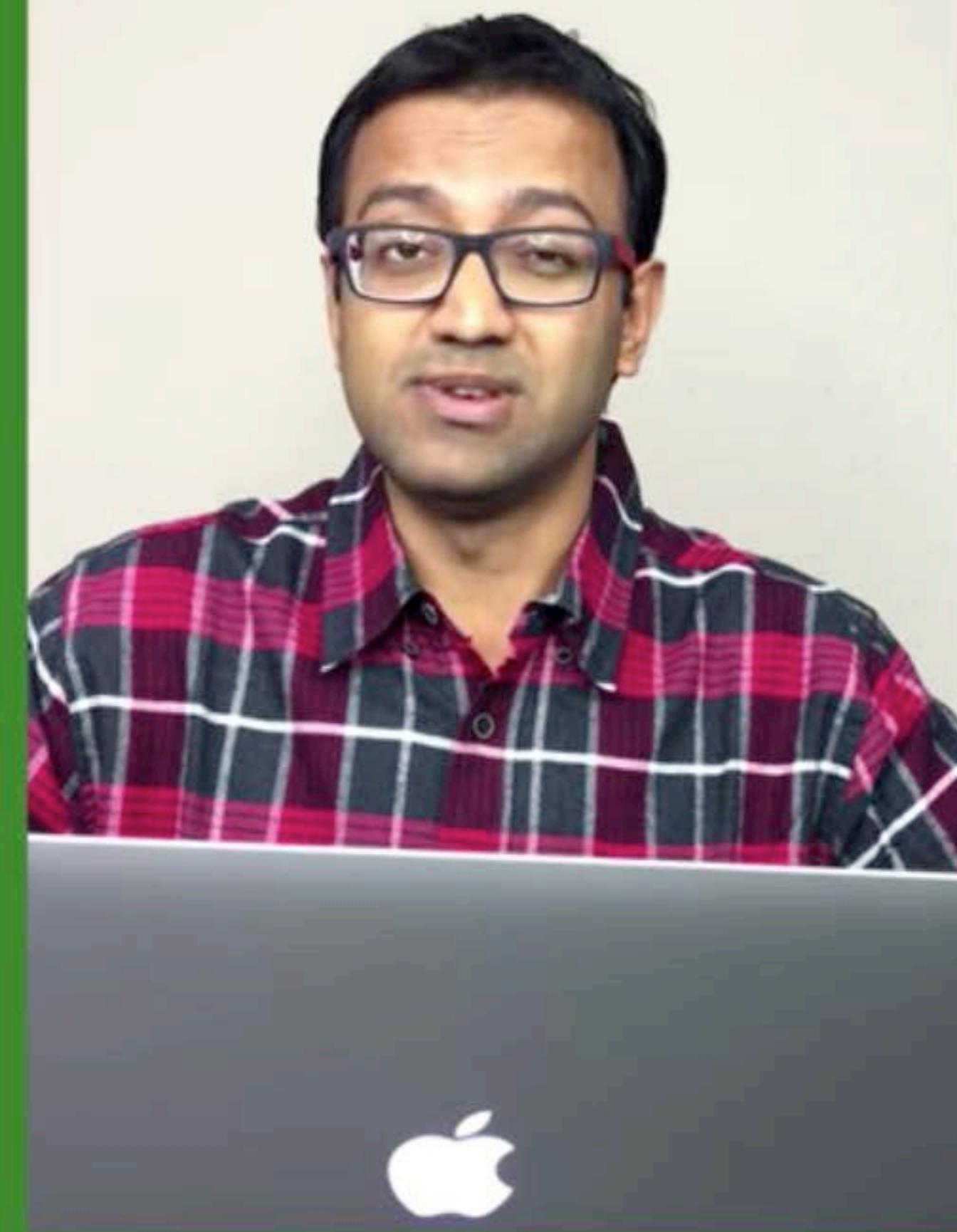
... create ... Spring based Applications ...



A medium shot of a man with dark hair and glasses, wearing a red and black plaid shirt. He is sitting at a desk with a laptop, looking towards the camera with a slight smile.

What is Spring?

- Application framework
- Programming and configuration model
- Infrastructure support



Problems with Spring

- Huge framework
- Multiple setup steps
- Multiple configuration steps
- Multiple build and deploy steps

Enter Spring Boot

- Opinionated
- Convention over configuration
- Stand alone
- Production ready



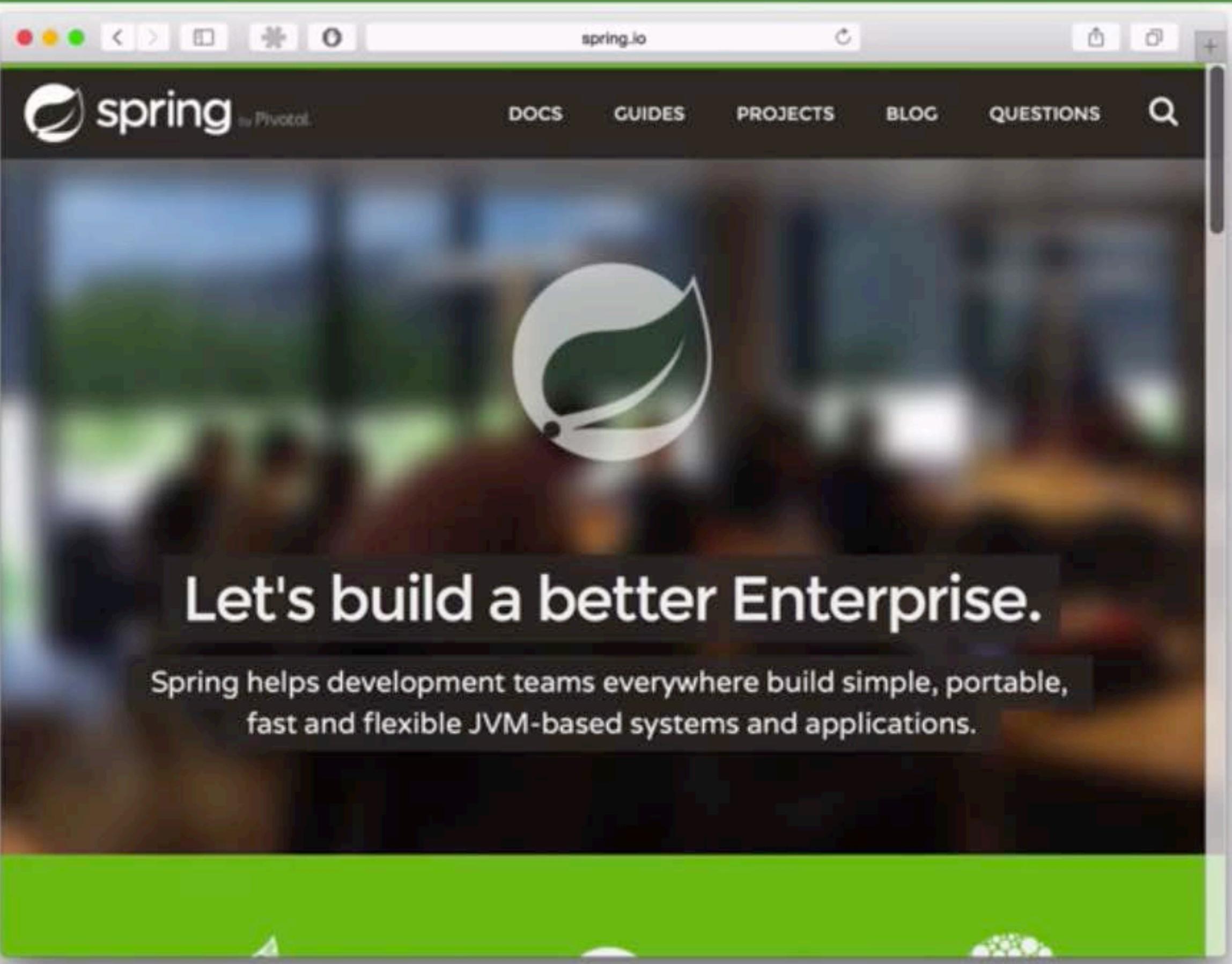


Setup: Java 8 SDK

```
~ $ java -version
java version "1.8.0_66"
Java(TM) SE Runtime Environment (build 1.8.0_66-b17)
Java HotSpot(TM) 64-Bit Server VM (build 25.66-b17, mixed mode)
~ $ echo $JAVA_HOME
/Library/Java/JavaVirtualMachines/jdk1.8.0_66.jdk/Contents/Home
~ $ █
```



Setup: Spring STS

A screenshot of the official Spring Framework website (spring.io) displayed in a web browser. The page features a large, blurred background image of a landscape with a prominent green circular logo in the center. At the top, there is a dark navigation bar with the Spring logo on the left and links for DOCS, GUIDES, PROJECTS, BLOG, and QUESTIONS on the right, along with a search icon. Below the navigation bar, the main headline reads "Let's build a better Enterprise." in large white text. A subtext below it states: "Spring helps development teams everywhere build simple, portable, fast and flexible JVM-based systems and applications." A large green button is visible at the bottom of the main content area.

spring.io

spring

DOCS GUIDES PROJECTS BLOG QUESTIONS

Let's build a better Enterprise.

Spring helps development teams everywhere build simple, portable, fast and flexible JVM-based systems and applications.



Spring as quickly as possible.

Browse the Guides >



Spring Tool Suite™

Your tools should be as refined as the code you write. STS is our Eclipse-based IDE crafted to serve the needs of building applications with Spring. We're always working on new features and performance in our mission to make STS the most productive Eclipse distribution available.

[Learn more about STS >](#)

Spring Projects



spring.io

spring

by Pivotal

DOCS GUIDES PROJECTS BLOG QUESTIONS

TOOLS

Spring Tool Suite™

The Spring Tool Suite is an Eclipse-based development environment that is customized for developing Spring applications. It provides a ready-to-use environment to implement, debug, run, and deploy your Spring applications, including integrations for Pivotal tc Server, Pivotal Cloud Foundry, Git, Maven, AspectJ, and comes on top of the latest Eclipse releases.

Included with the Spring Tool Suite is the developer edition of Pivotal tc Server, the drop-in replacement for Apache Tomcat that's optimized for Spring. With its Spring Insight console, tc Server Developer Edition provides a graphical real-time view of application performance metrics that lets developers identify and diagnose problems from their desktops.

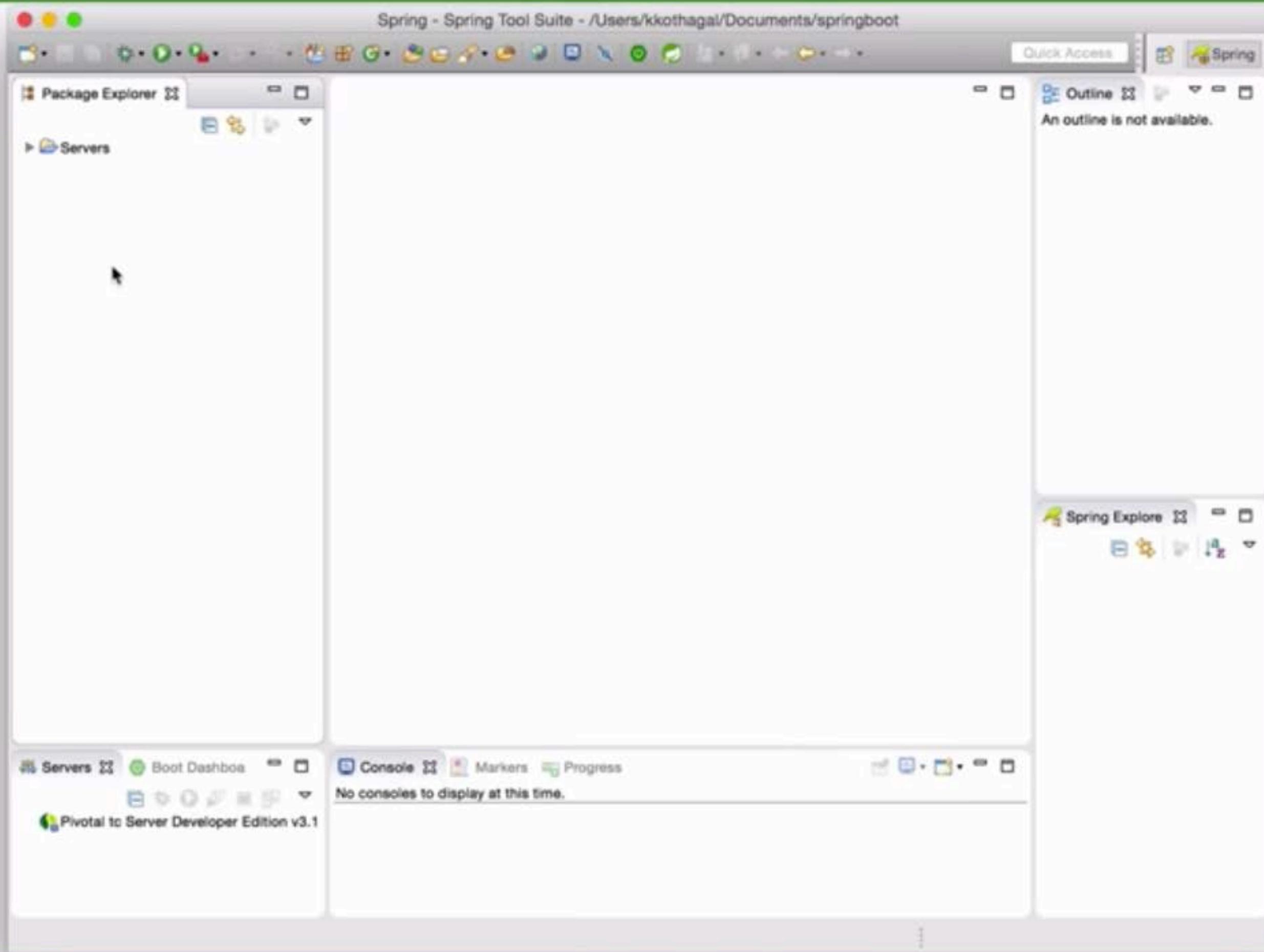
The Spring Tool suite supports application targeting to local, virtual and cloud-based servers. It is freely available for development and internal business operations use with no time limits, fully open-source and licensed under the terms of the Eclipse Public License.

Feature Highlights



DOWNLOAD STS
(3.8.2.RELEASE for Mac)

See All Versions

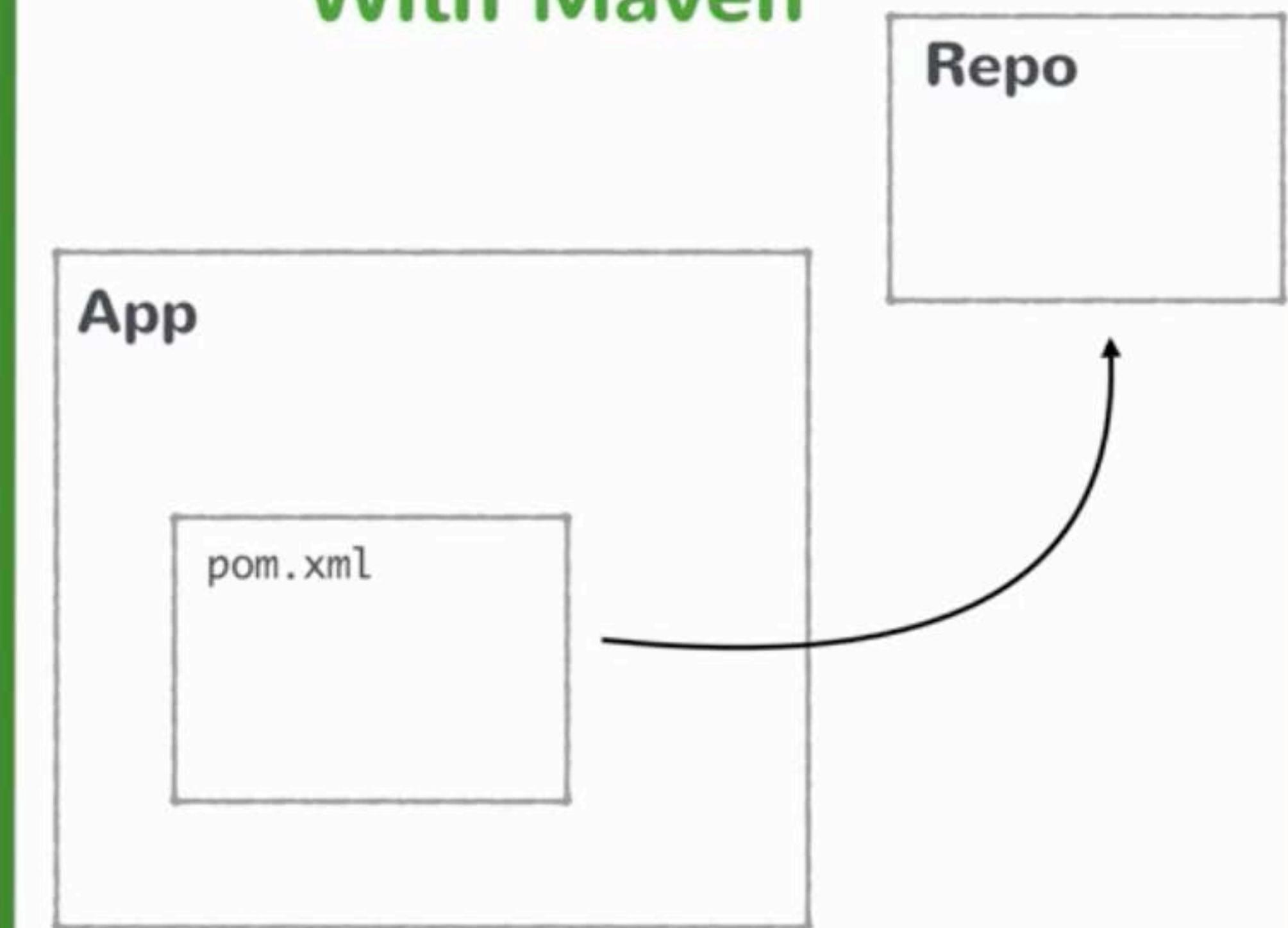


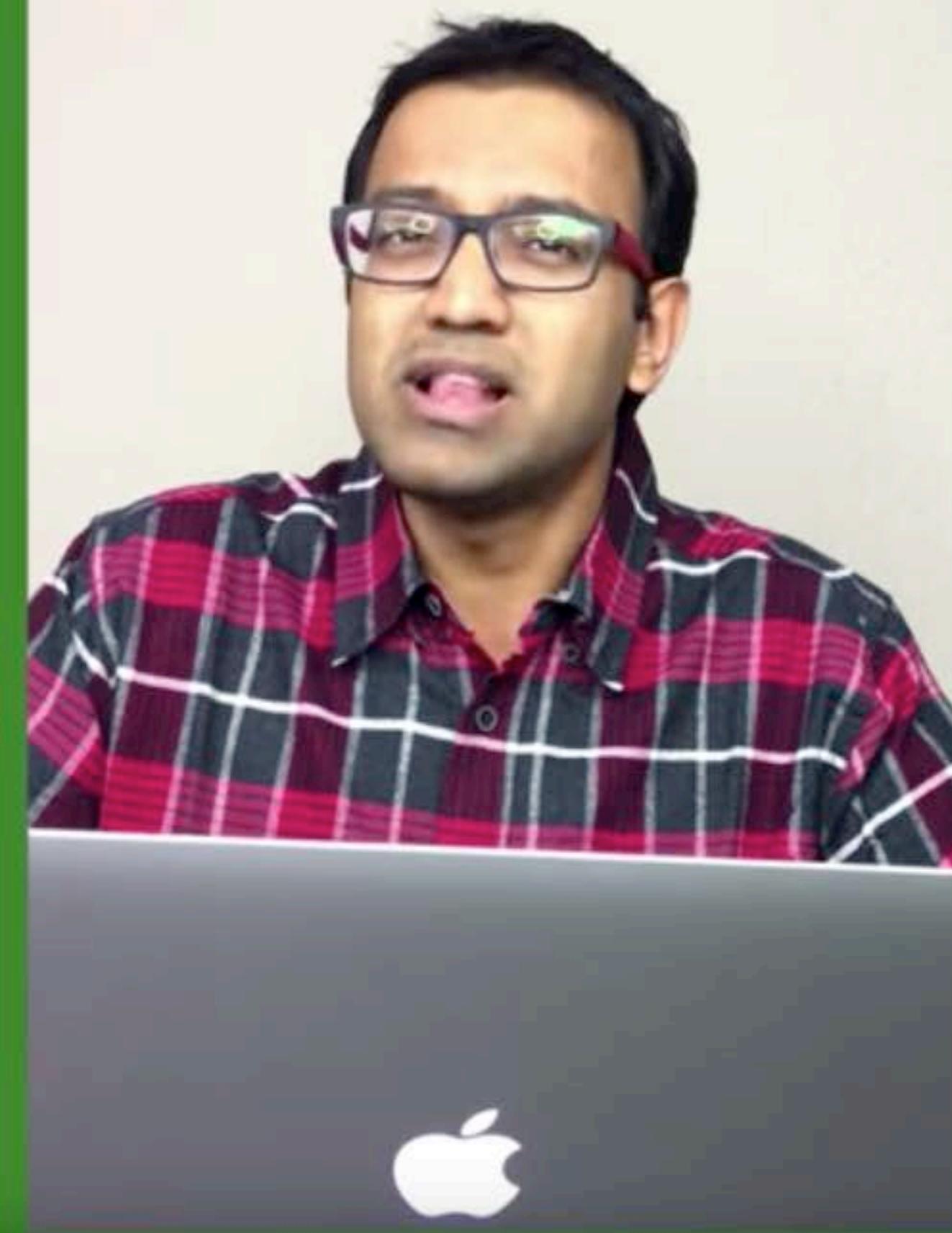
Java dependencies

App



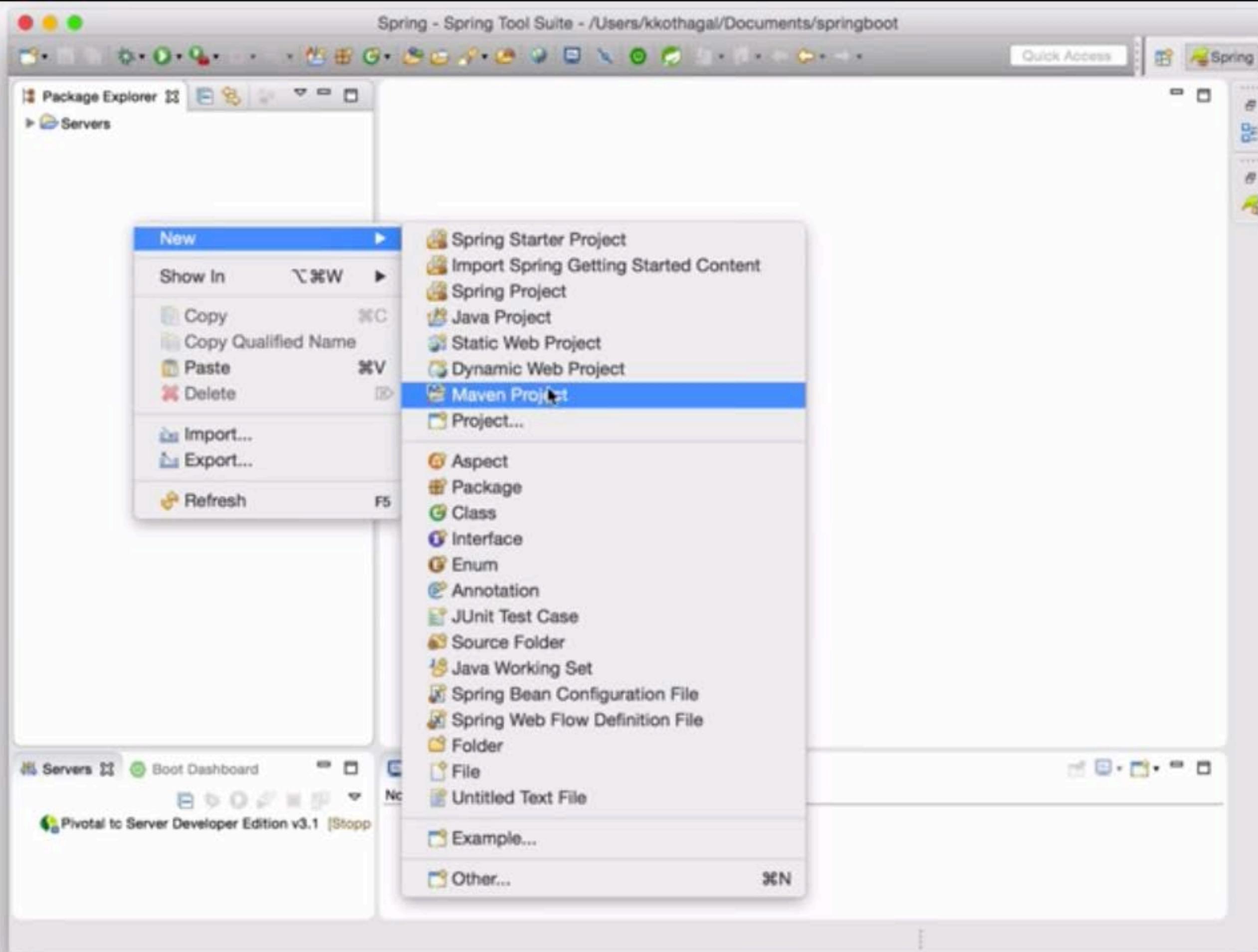
With Maven

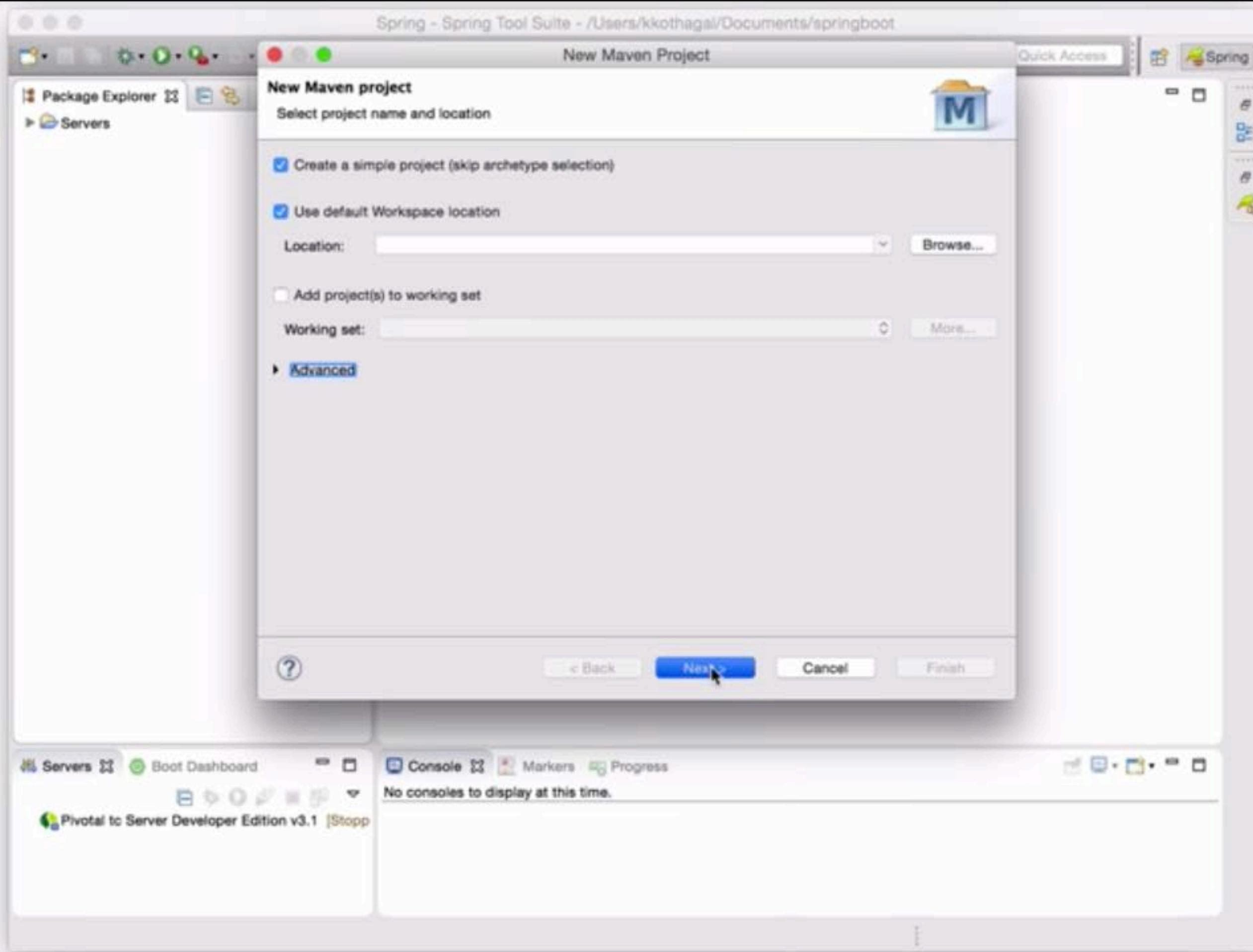


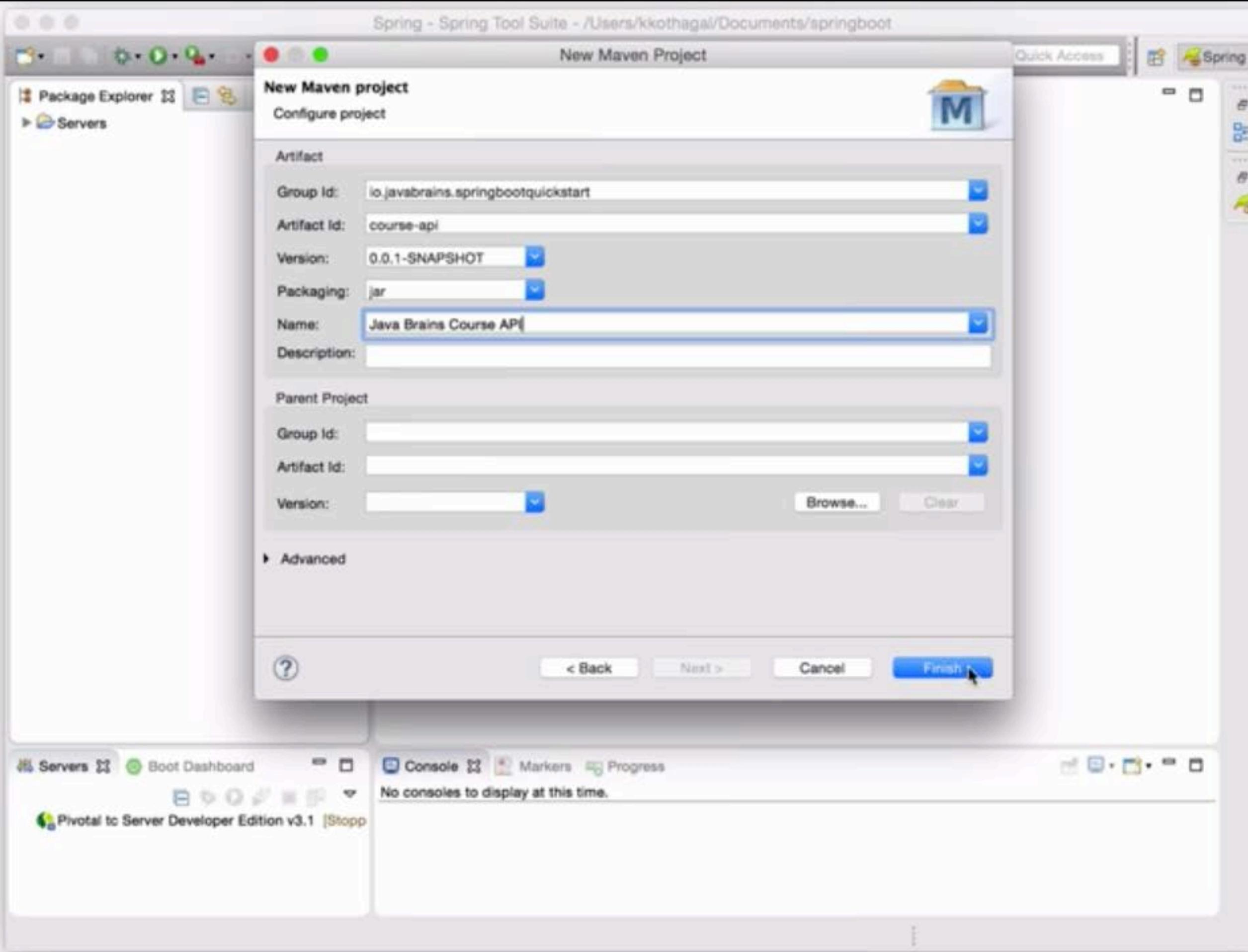


Creating a project

Creating a Maven Java project







Spring - course-api/pom.xml - Spring Tool Suite - /Users/kkothagal/Documents/springboot

Quick Access Spring

Package Explorer course-api pom.xml

```
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">4.0.0io.javabrains.springbootquickstartcourse-api0.0.1-SNAPSHOTJava Brains Course API
```

JRE System Library [J2SE-1.5] src target pom.xml Servers

Overview Dependencies Dependency Hierarchy Effective POM pom.xml

Servers Boot Dashboard

Console Markers Progress

No consoles to display at this time.

Pivotal to Server Developer Edition v3.1 | Stop

Writable Smart Insert 1:1

Spring - course-api/pom.xml - Spring Tool Suite - /Users/kkothagal/Documents/springboot

Quick Access Spring

Package Explorer course-api pom.xml

src/main/java
src/main/resources
src/test/java
src/test/resources
JRE System Library [J2SE-1.8]
src
target
pom.xml
Servers

```
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <groupId>io.javabrains.springbootquickstart</groupId>
  <artifactId>course-api</artifactId>
  <version>0.0.1-SNAPSHOT</version>
  <name>Java Brains Course API</name>

  <parent>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-parent</artifactId>
    <version>1.4.2.RELEASE</version>
  </parent>

</project>
```

Overview Dependencies Dependency Hierarchy Effective POM pom.xml

Servers 23 Boot Dashboard

Console Markers Progress

No consoles to display at this time.

Pivotal tc Server Developer Edition v3.1 [Stop]

project/parent/version/#text Writable Smart Insert 11 : 33

Spring - course-api/pom.xml - Spring Tool Suite - /Users/kkothagal/Documents/springboot

Quick Access Spring

Package Explorer course-api pom.xml

src/main/java
src/main/resources
src/test/java
src/test/resources
JRE System Library [J2SE-1.8]
src
target
pom.xml
Servers

```
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <groupId>io.javabrains.springbootquickstart</groupId>
  <artifactId>course-api</artifactId>
  <version>0.0.1-SNAPSHOT</version>
  <name>Java Brains Course API</name>

  <parent>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-parent</artifactId>
    <version>1.4.2.RELEASE</version>
  </parent>

  <dependencies>
    <dependency>
      <groupId>org.springframework.boot</groupId>
      <artifactId>spring-boot-starter-web</artifactId>
    </dependency>
  </dependencies>

</project>
```

Overview Dependencies Dependency Hierarchy Effective POM pom.xml

Servers 23 Boot Dashboard

Console Markers Progress

No consoles to display at this time.

Pivotal tc Server Developer Edition v3.1 [Stop]

project/dependencies/dependency/artifactId/#Text Writable Smart Insert 18 : 38

Spring - course-api/pom.xml - Spring Tool Suite - /Users/kkothagal/Documents/springboot

Quick Access Spring

Package Explorer course-api [boot]

- src/main/java
- src/main/resources
- src/test/java
- src/test/resources
- JRE System Library [J2SE-1.8]
- Maven Dependencies
- src
- target
- pom.xml

Servers

course-api/pom.xml

```
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">4.0.0io.javabrains.springbootquickstartcourse-api0.0.1-SNAPSHOTJava Brains Course APIorg.springframework.bootspring-boot-starter-parent1.4.2.RELEASEorg.springframework.bootspring-boot-starter-web
```

Overview Dependencies Dependency Hierarchy Effective POM pom.xml

Servers Boot Dashboard

Console Markers Progress

No consoles to display at this time.

Pivotal tc Server Developer Edition v3.1 [Stop]

Writable Smart Insert 12:14

Spring - course-api/pom.xml - Spring Tool Suite - /Users/kkothagal/Documents/springboot

Quick Access Spring

Package Explorer course-api [boot]

- src/main/java
- src/main/resources
- src/test/java
- src/test/resources

JRE System Library [J2SE-1.8]

Maven Dependencies

- spring-boot-starter-web-1.4.2.RELEASE.jar
- spring-boot-starter-1.4.2.RELEASE.jar - /Users/kkothagal...
- spring-boot-1.4.2.RELEASE.jar - /Users/kkothagal...
- spring-boot-autoconfigure-1.4.2.RELEASE.jar
- spring-boot-starter-logging-1.4.2.RELEASE.jar
- logback-classic-1.1.7.jar - /Users/kkothagal...
- logback-core-1.1.7.jar - /Users/kkothagal...
- slf4j-api-1.7.21.jar - /Users/kkothagal/.m2...
- jcl-over-slf4j-1.7.21.jar - /Users/kkothagal...
- jul-to-slf4j-1.7.21.jar - /Users/kkothagal...
- log4j-over-slf4j-1.7.21.jar - /Users/kkothagal...
- spring-core-4.3.4.RELEASE.jar - /Users/kkothagal...
- snakeyaml-1.17.jar - /Users/kkothagal/.m2...
- spring-boot-starter-tomcat-1.4.2.RELEASE.jar
- tomcat-embed-core-8.5.6.jar - /Users/kkothagal...
- tomcat-embed-el-8.5.6.jar - /Users/kkothagal...
- tomcat-embed-websocket-8.5.6.jar - /Users/kkothagal...
- hibernate-validator-5.2.4.Final.jar - /Users/kkothagal...
- validation-api-1.1.0.Final.jar - /Users/kkothagal...
- jboss-logging-3.3.0.Final.jar - /Users/kkothagal...
- classmate-1.3.3.jar - /Users/kkothagal/.m2...
- jackson-databind-2.8.4.jar - /Users/kkothagal...
- jackson-annotations-2.8.4.jar - /Users/kkothagal...

course-api/pom.xml

```
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">4.0.0io.javabrains.springbootquickstartcourse-api0.0.1-SNAPSHOTJava Brains Course APIorg.springframework.bootspring-boot-starter-parent1.4.2.RELEASEorg.springframework.bootspring-boot-starter-web
```

Overview Dependencies Dependency Hierarchy Effective POM pom.xml

Servers 23 Boot Dashboard

Pivotal tc Server Developer Edition v3.1 [Stop]

Console Markers Progress

No consoles to display at this time.

pom.xml - course-api

Spring - course-api/pom.xml - Spring Tool Suite - /Users/kkothagal/Documents/springboot

javabrains.io

Package Explorer course-api [boot]

- src/main/java
- src/main/resources
- src/test/java
- src/test/resources
- JRE System Library [J2SE-1.8]
- Maven Dependencies
- src
- target
- pom.xml

Servers

course-api/pom.xml

```
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">4.0.0io.javabrains.springbootquickstartcourse-api0.0.1-SNAPSHOTJava Brains Course APIorg.springframework.bootspring-boot-starter-parent1.4.2.RELEASEorg.springframework.bootspring-boot-starter-web
```

Overview Dependencies Dependency Hierarchy Effective POM pom.xml

Servers 23 Boot Dashboard

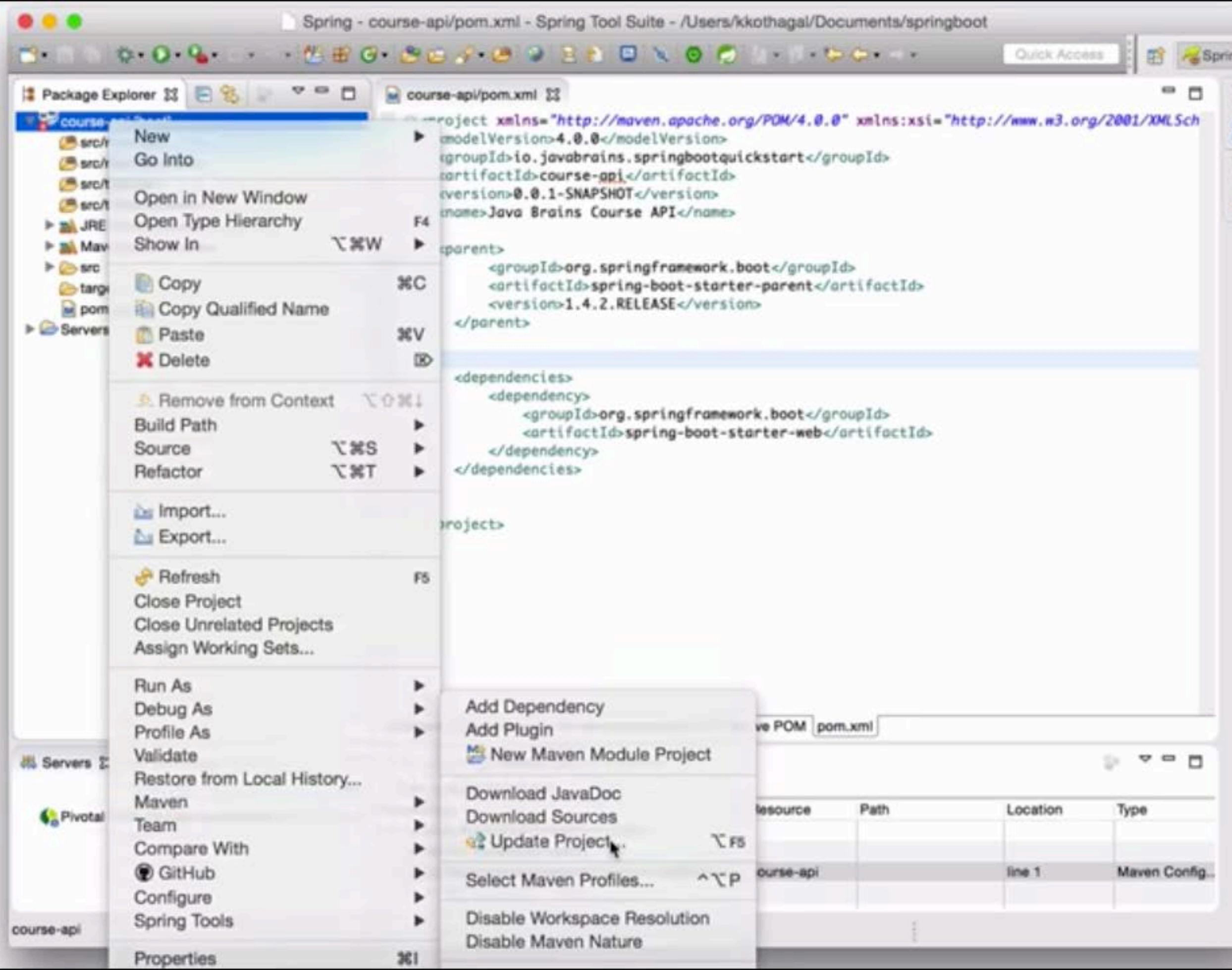
Pivotal tc Server Developer Edition v3.1 [Stop]

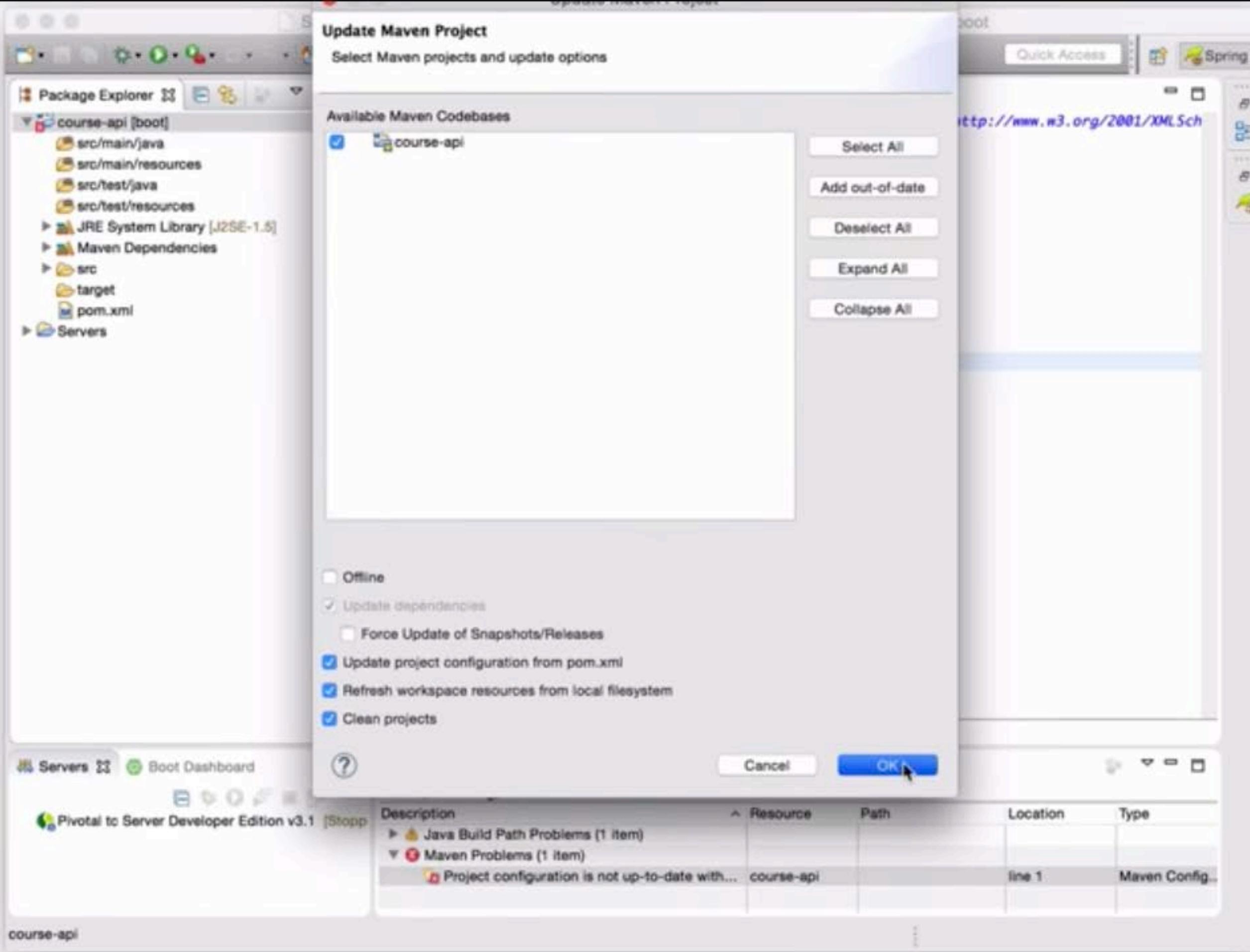
Console Markers Progress

1 error, 1 warning, 0 others

Description	Resource	Path	Location	Type
Java Build Path Problems (1 item)				
Maven Problems (1 item)				
Project configuration is not up-to-date with...	course-api		line 1	Maven Config.

Project configuration is not up-to-date with pom.xml. Select: Maven->Update Project... from the project context menu or use Quick Fix.





Spring - course-api/pom.xml - Spring Tool Suite - /Users/kkothagai/Documents/springboot

Quick Access Spring

Package Explorer course-api [boot]

- src/main/java
- src/main/resources
- src/test/java
- src/test/resources

JRE System Library [JavaSE-1.8]

Maven Dependencies

course-api/pom.xml

```
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">4.0.0io.javabrains.springbootquickstartcourse-api0.0.1-SNAPSHOTJava Brains Course APIorg.springframework.bootspring-boot-starter-parent1.4.2.RELEASEorg.springframework.bootspring-boot-starter-web
```

Overview Dependencies Dependency Hierarchy Effective POM pom.xml

Servers 23 Boot Dashboard

Pivotal tc Server Developer Edition v3.1 [Stop]

Console Markers Progress

0 errors, 1 warning, 0 others

Description	Resource	Path	Location	Type
Java Build Path Problems (1 item)				

course-api

Spring - course-api/pom.xml - Spring Tool Suite - /Users/kkothagal/Documents/springboot

Quick Access Spring

Package Explorer course-api [boot]

- src/main/java
- src/main/resources
- src/test/java
- src/test/resources
- JRE System Library [JavaSE-1.6]
- Maven Dependencies
- src
- target
- pom.xml

Servers

course-api/pom.xml

```
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">4.0.0io.javabrains.springbootquickstartcourse-api0.0.1-SNAPSHOTJava Brains Course APIorg.springframework.bootspring-boot-starter-parent1.4.2.RELEASEorg.springframework.bootspring-boot-starter-web1.8
```

Overview Dependencies Dependency Hierarchy Effective POM pom.xml

Servers Boot Dashboard

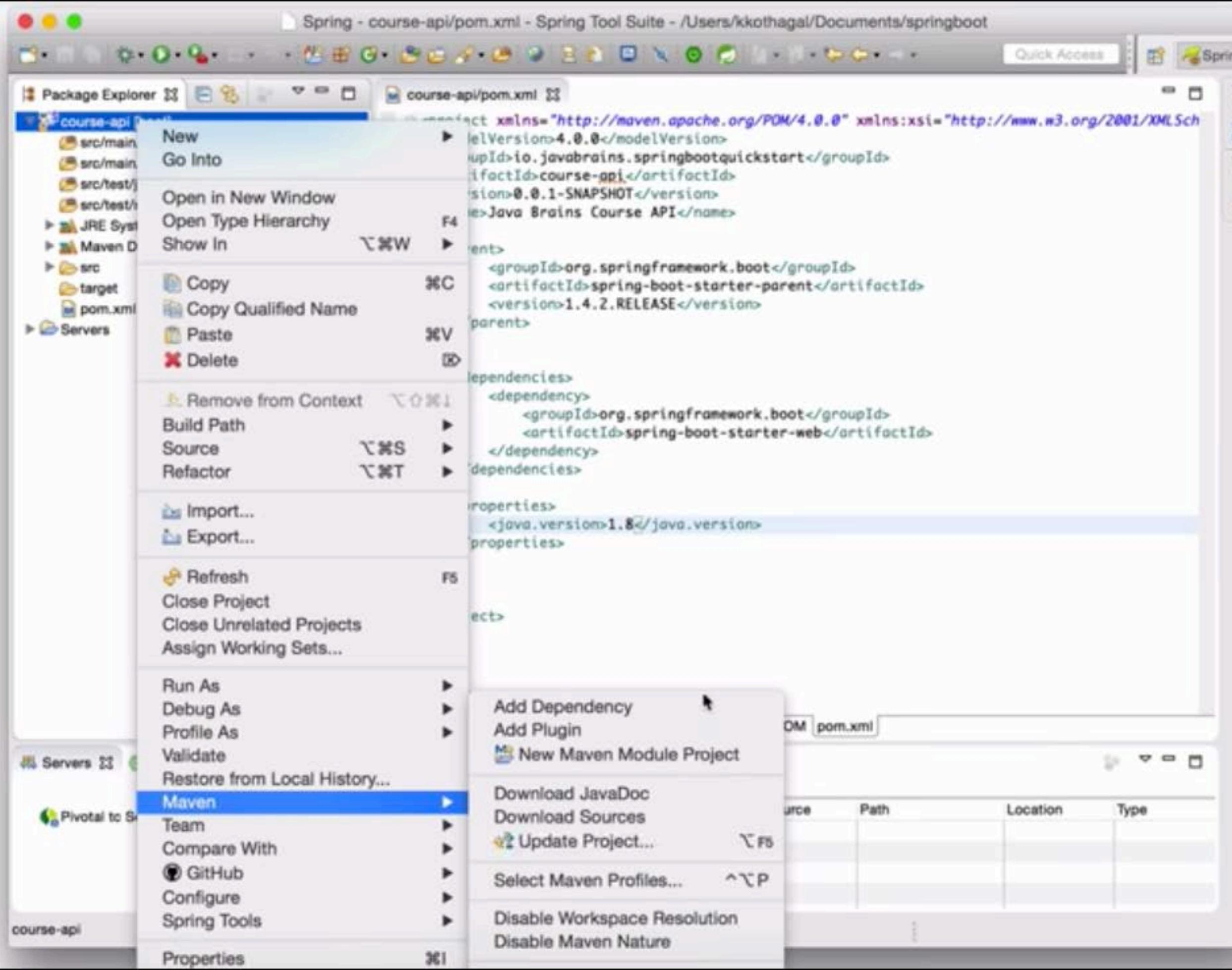
Pivotal tc Server Developer Edition v3.1 [Stop]

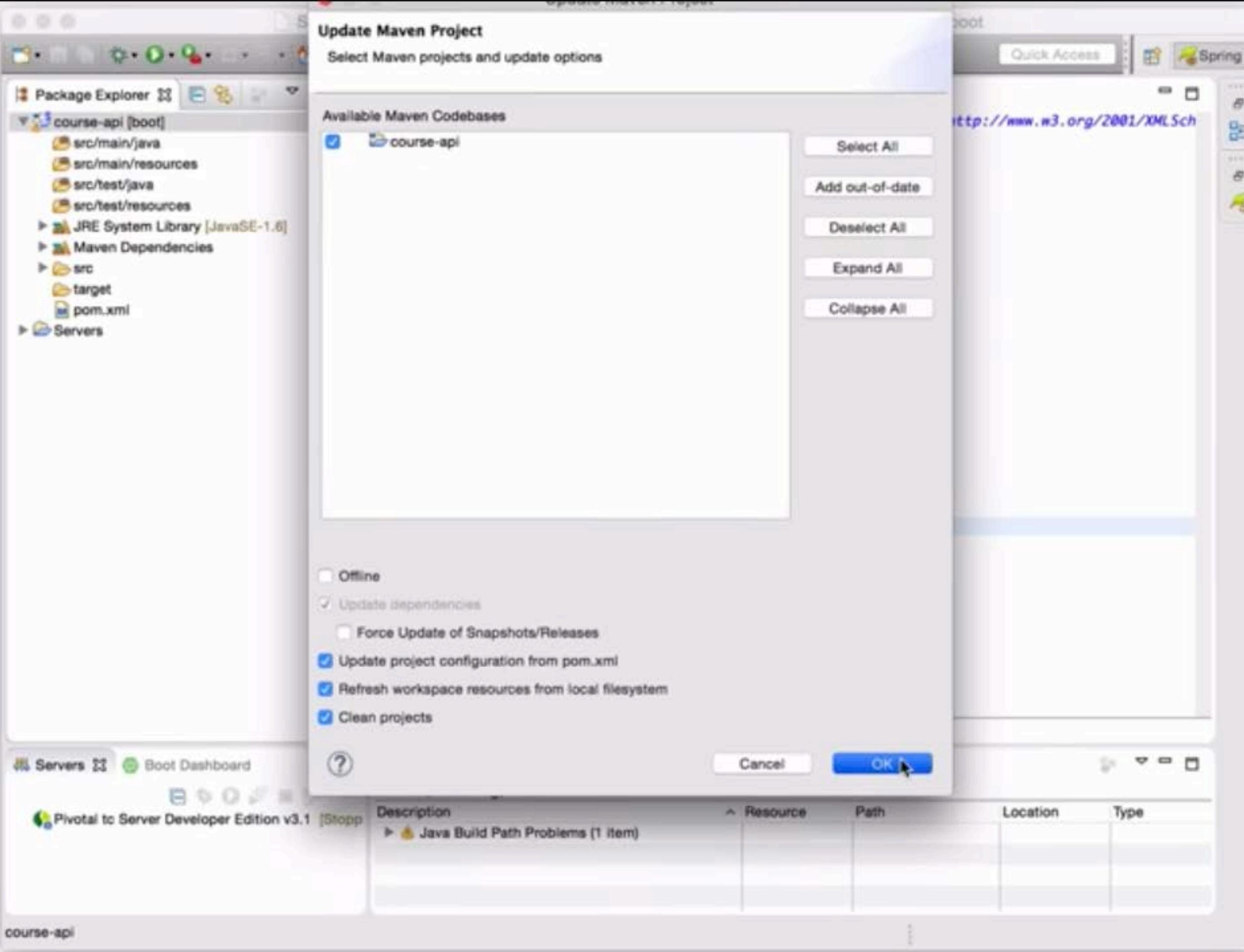
Console Markers Progress

0 errors, 1 warning, 0 others

Description	Resource	Path	Location	Type
Java Build Path Problems (1 item)				

Writable Smart Insert 23 : 41





Spring - course-api/pom.xml - Spring Tool Suite - /Users/kkothagal/Documents/springboot

Quick Access Spring

Package Explorer course-api [boot]

- src/main/java
- src/main/resources
- src/test/java
- src/test/resources
- JRE System Library [JavaSE-1.8]
- Maven Dependencies
- src
- target
- pom.xml

Servers

course-api/pom.xml

```
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">4.0.0io.javabrains.springbootquickstartcourse-api0.0.1-SNAPSHOTJava Brains Course APIorg.springframework.bootspring-boot-starter-parent1.4.2.RELEASEorg.springframework.bootspring-boot-starter-web1.8
```

Overview Dependencies Dependency Hierarchy Effective POM pom.xml

Servers 23 Boot Dashboard

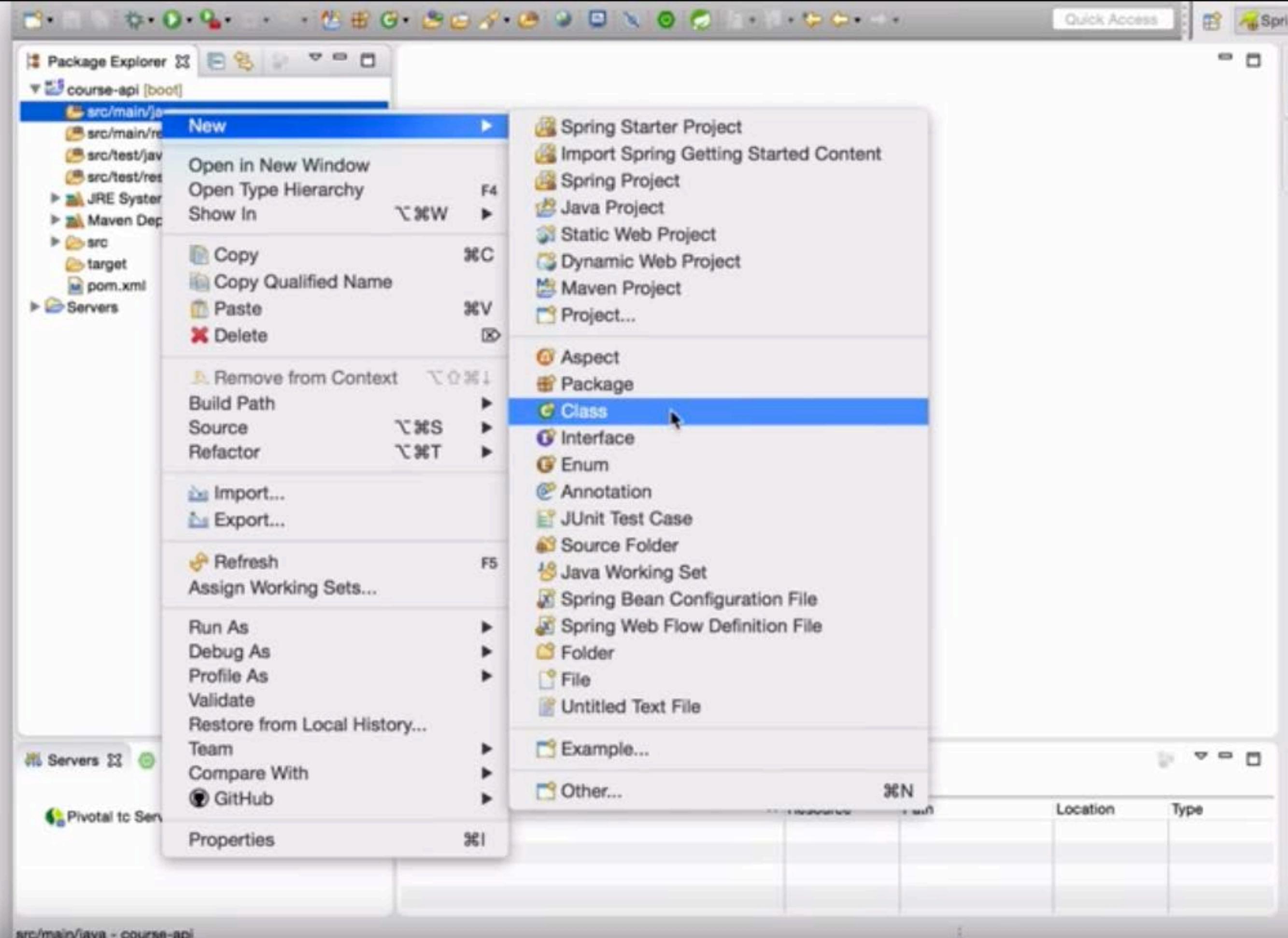
Pivotal tc Server Developer Edition v3.1 [Stop]

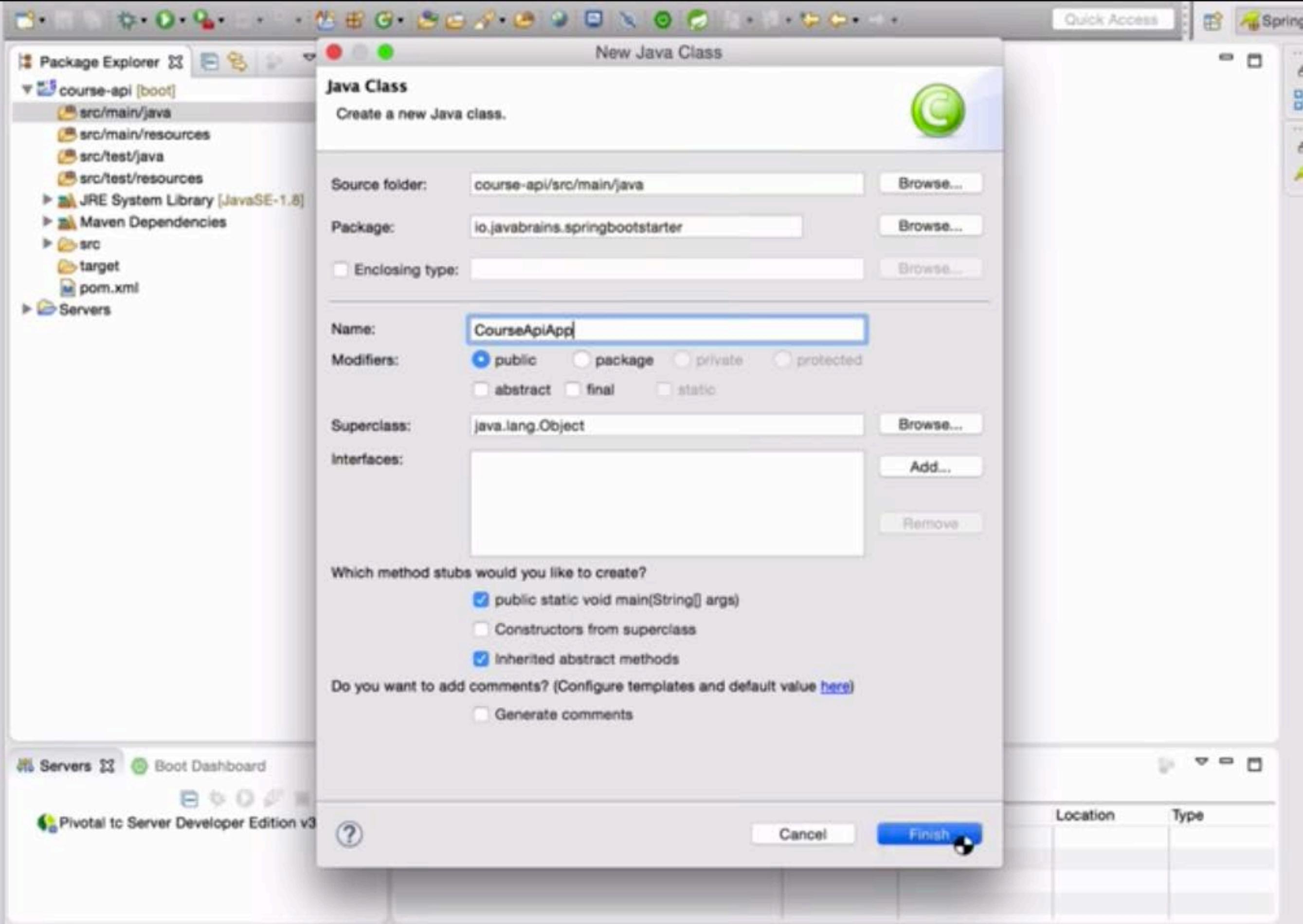
Console Markers Progress

0 items

Description	Resource	Path	Location	Type

project/dependencies/dependency/artifactId Writable Smart Insert 18 : 21





Servers Boot Dashboard

Pivotal tc Server Developer Edition v3

The screenshot shows the Eclipse IDE interface with the following details:

- Package Explorer View:** Shows the project structure for "course-api [boot]". The "src/main/java" folder contains the package "io.javabrains.springbootstarter" and the class "CourseApiApp.java", which is currently selected.
- Code Editor View:** Displays the content of "CourseApiApp.java":

```
package io.javabrains.springbootstarter;

public class CourseApiApp {

    public static void main(String[] args) {
        // N000 Auto-generated method stub
    }
}
```
- Servers View:** Shows a connection to "Pivotal tc Server Developer Edition v3.1 [Stopped]".
- Bottom Status Bar:** Shows "Writable" and "Smart Insert" status.

The screenshot shows the Eclipse IDE interface with the following details:

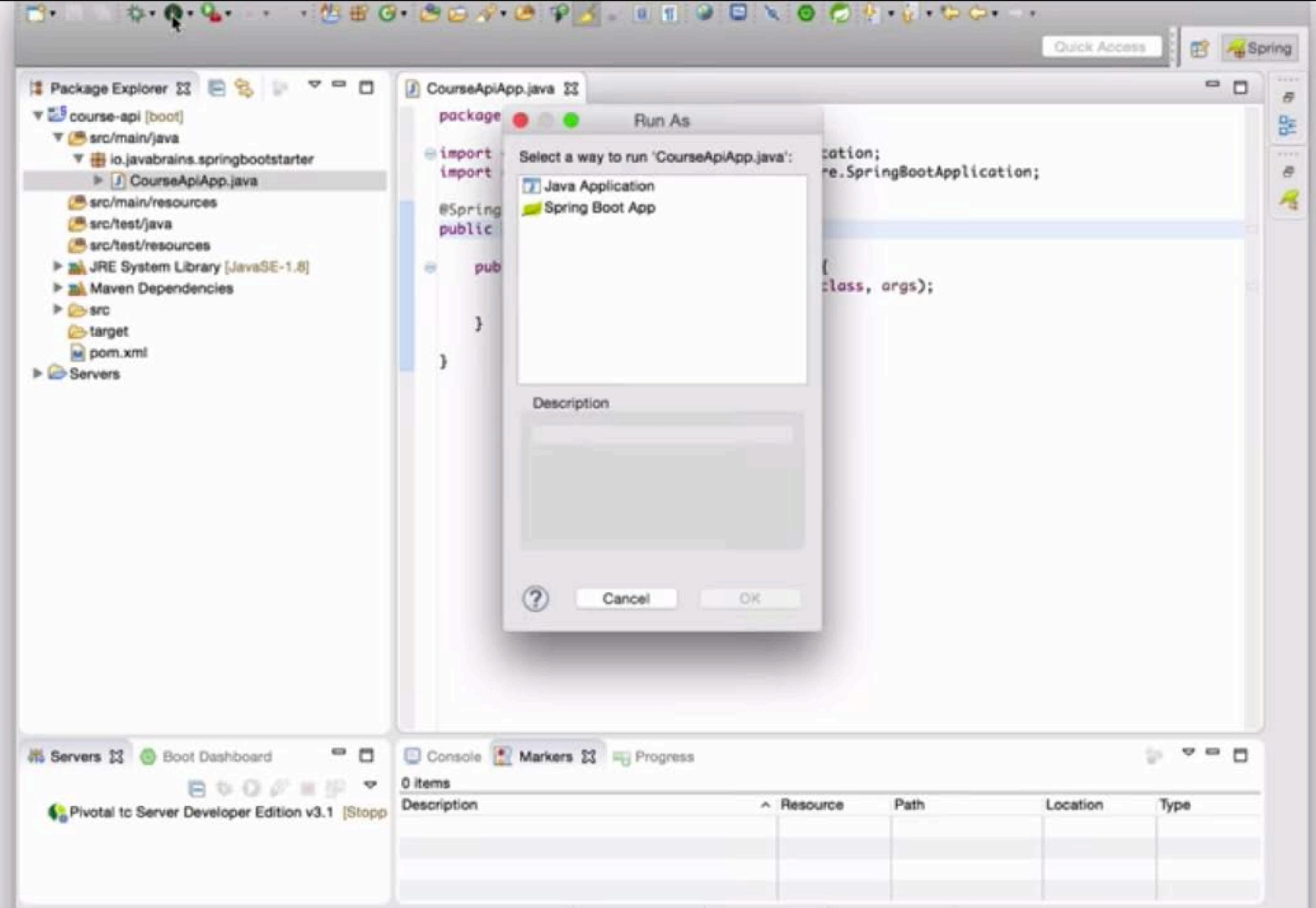
- Package Explorer:** Shows the project structure for "course-api [boot]". The file "CourseApiApp.java" is selected.
- Code Editor:** Displays the content of "CourseApiApp.java":

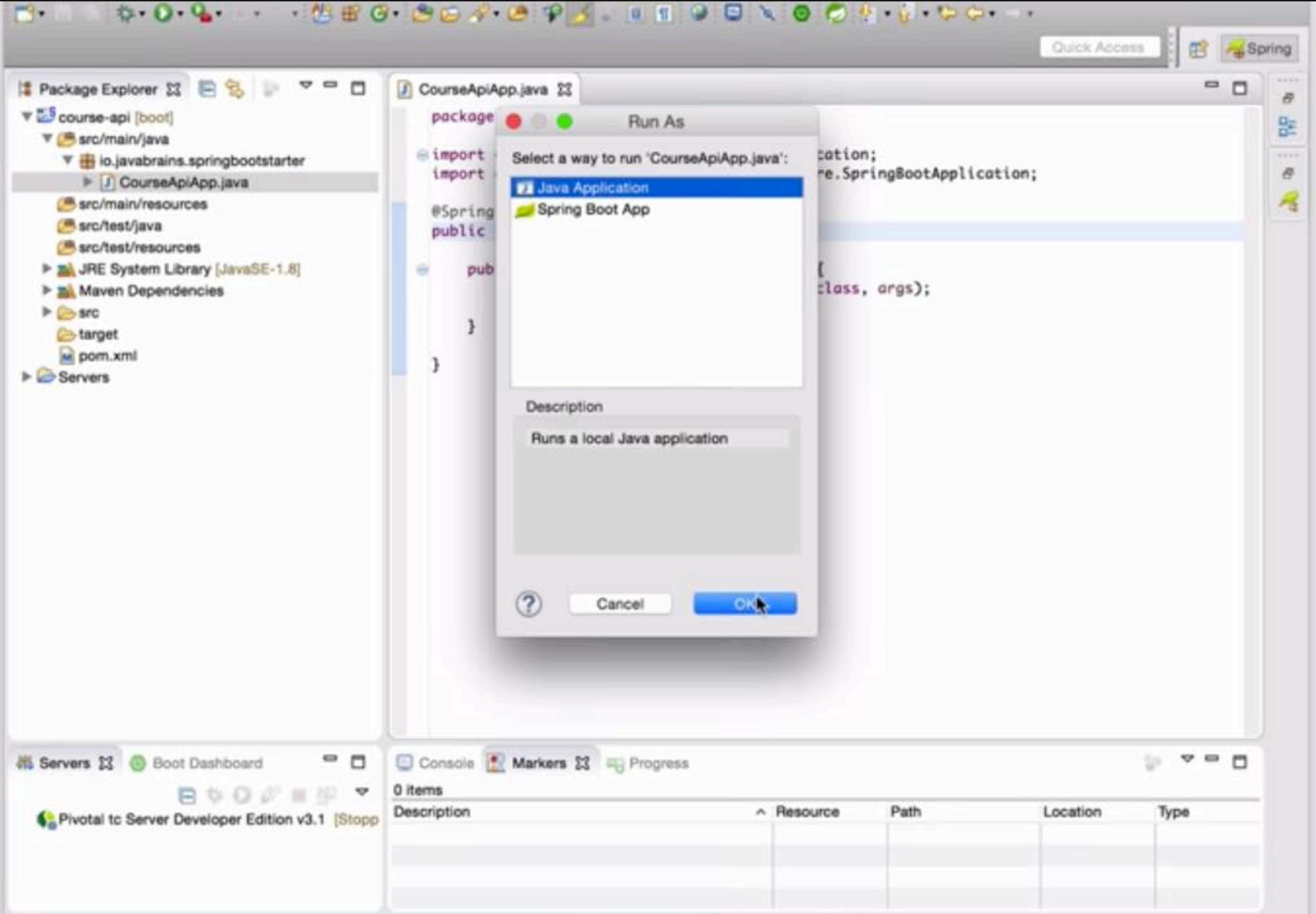
```
package io.javabrains.springbootstarter;  
@SpringBootApplication  
public class CourseApiApp {  
    public static void main(String[] args) {  
        SpringApplication.run(CourseApiApp.class, args);  
    }  
}
```

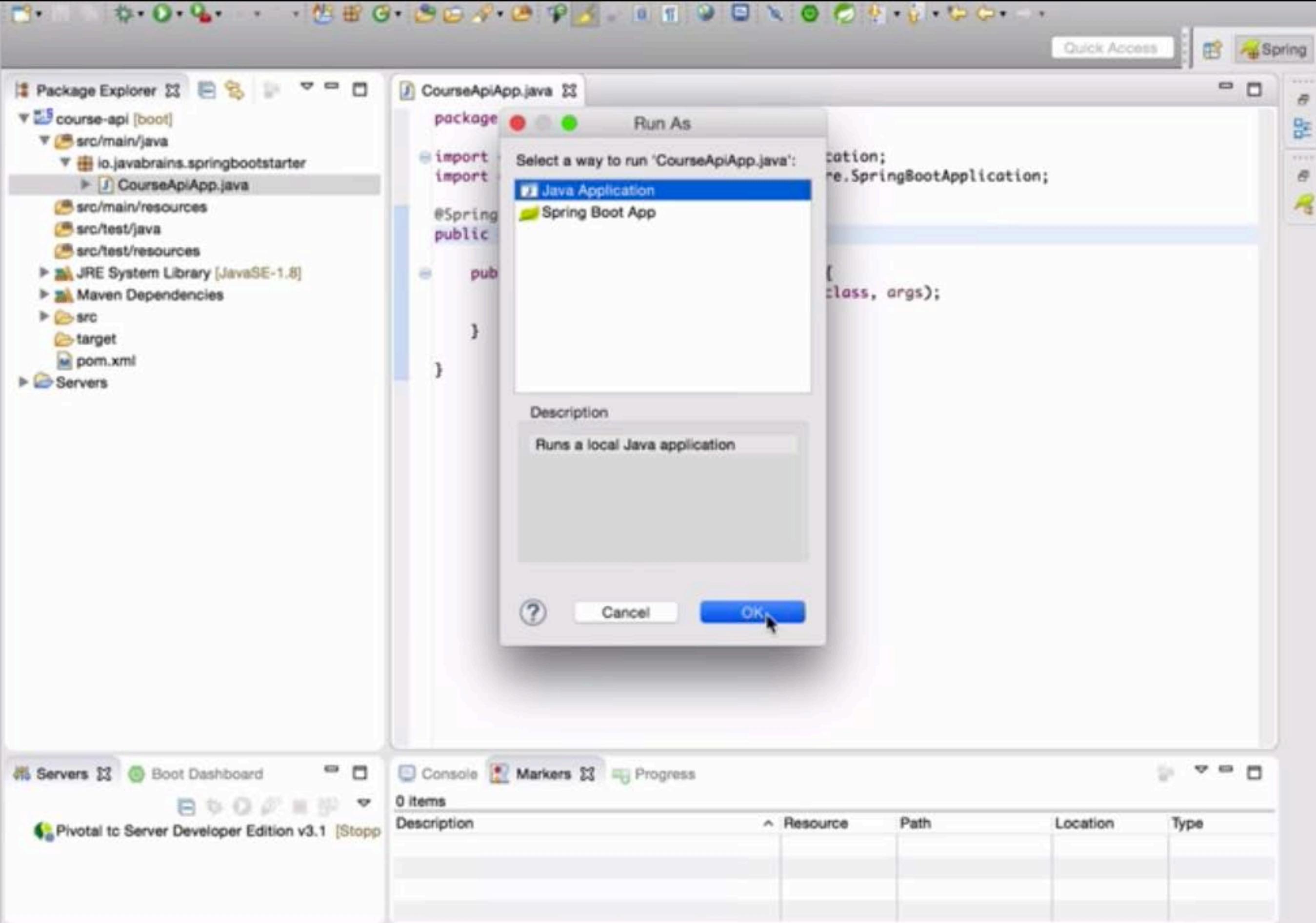
A code completion tooltip is open at the annotation `@SpringBootApplication`, showing the error message: "SpringBootApplication cannot be resolved to a type" and four quick fix options:
 - Import 'SpringBootApplication' from 'org.springframework.boot.autoconfigure'
 - Create annotation 'SpringBootApplication'
 - Change to 'SpringBootConfiguration' (org.springframework.boot)
 - Fix project setup...
- Servers:** Shows "Pivotal tc Server Developer Edition v3.1 [Stopped]".
- Bottom Bar:** Includes tabs for "Servers", "Boot Dashboard", "Console", "Markers", and "Progress".
- Quick Access:** A toolbar with various icons.
- Spring:** A toolbar icon for Spring support.

The screenshot shows the Eclipse IDE interface with the following details:

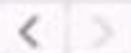
- Package Explorer View:** Shows the project structure for "course-api [boot]". The "src/main/java" folder contains the package "io.javabrains.springbootstarter" and the file "CourseApiApp.java". Other visible files include "src/main/resources", "src/test/java", "src/test/resources", "JRE System Library [JavaSE-1.8]", "Maven Dependencies", "src", "target", and "pom.xml".
- Editor View:** Displays the code for "CourseApiApp.java". The code defines a main class "CourseApiApp" with a static void main method that runs the application using SpringApplication.run.
- Servers View:** Shows a connection to "Pivotal tc Server Developer Edition v3.1 [Stopped]".
- Bottom Status Bar:** Shows "Writable", "Smart Insert", and the time "10 : 57".







```
2020-05-22 10:59:53.529  INFO 1 --- [           main] o.s.j.e.a.AnnotationMBeanExporter       : Registering beans for JMX exposure on startup
2020-05-22 10:59:53.530  INFO 1 --- [           main] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat started on port(s): 8880 (http)
2020-05-22 10:59:53.530  INFO 1 --- [           main] i.j.springbootstarter.CourseApiApp      : Started CourseApiApp in 2.535 seconds (JVM running for 2.828)
```



Whitelabel Error Page

This application has no explicit mapping for /error, so you are seeing this as a fallback.

Fri Nov 25 14:13:04 PST 2016

There was an unexpected error (type=Not Found, status=404).

No message available

Starting Spring Boot

```
SpringApplication.run(App.class, args);
```



Starting Spring Boot

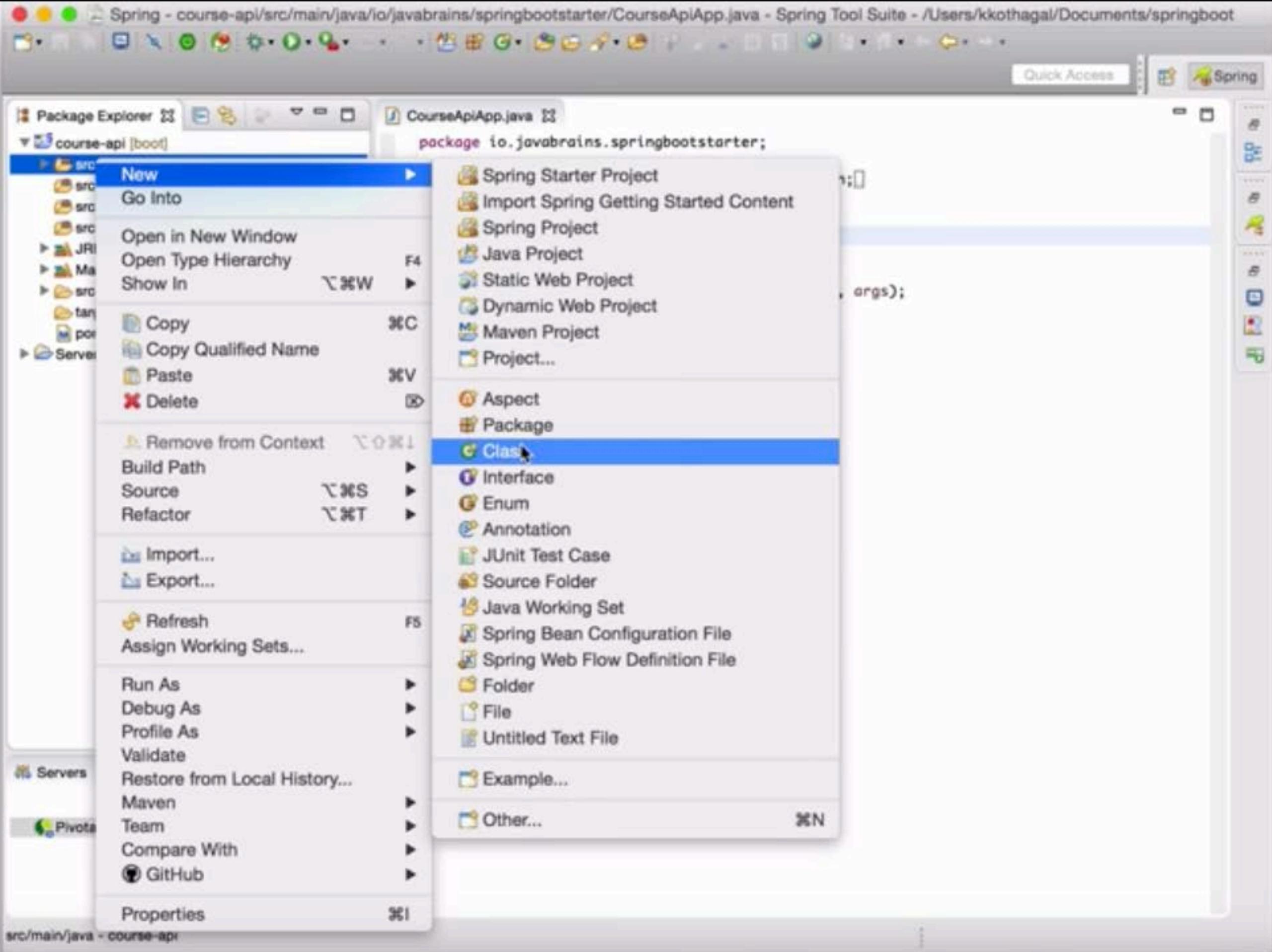
- Sets up default configuration
- Starts Spring application context
- Performs class path scan
- Starts Tomcat server

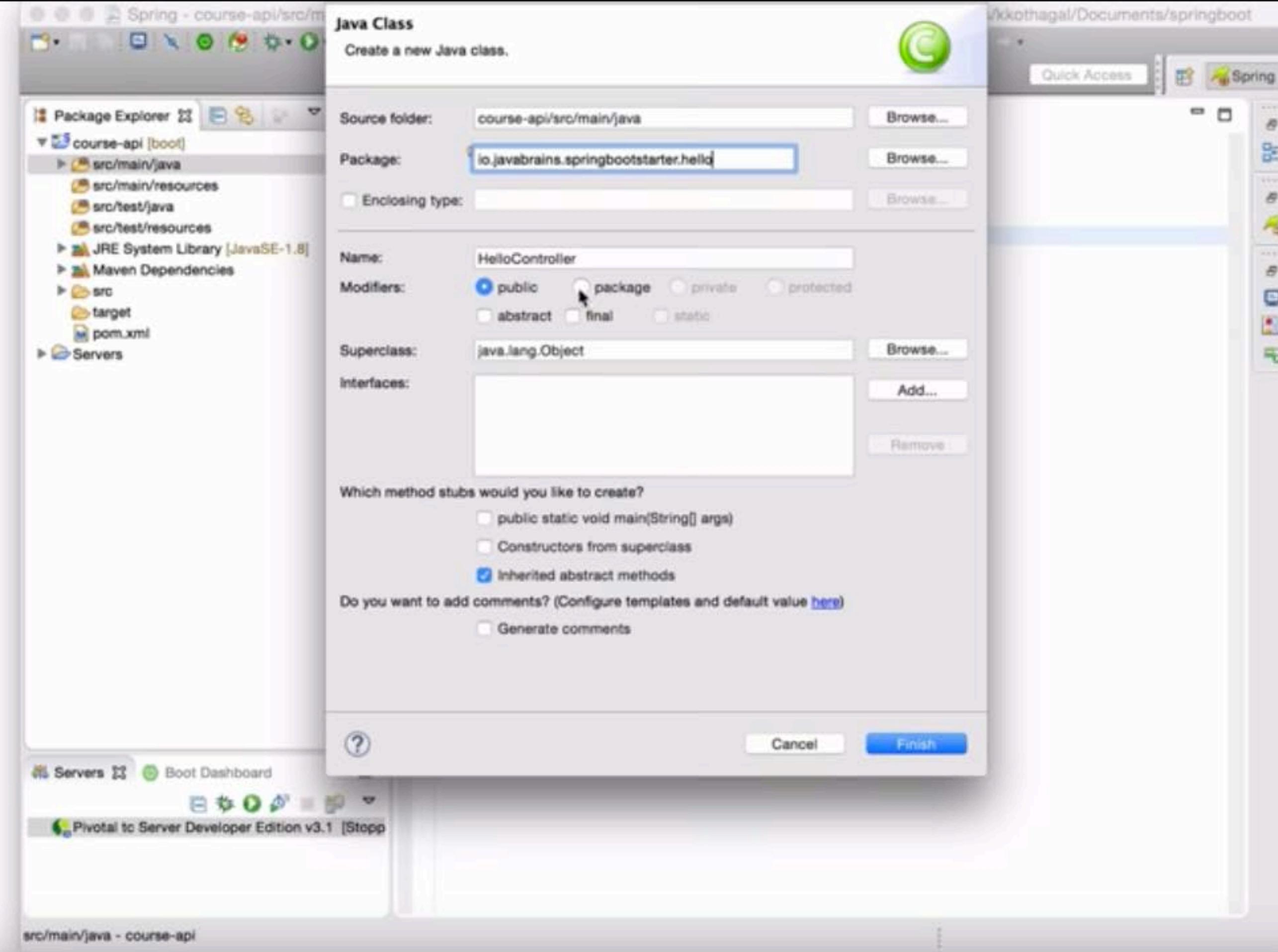


Let's add a controller

- A Java class
- Marked with annotations
- Has info about
 - What URL access triggers it?
 - What method to run when accessed?







Spring - course-api/src/main/java/io/javabrainsspringbootstarter/hello/HelloController.java - Spring Tool Suite - /Users/kkothagai/Documents/springboot

javabrainss.io

Package Explorer CourseApiApp.java HelloController.java

```
CourseApiApp.java HelloController.java
package io.javabrainsspringbootstarter.hello;

public class HelloController {
```

Servers Boot Dashboard

Pivotal tc Server Developer Edition v3.1 [Stop]

Writable Smart Insert 6 : 1

Spring - course-api/src/main/java/io/javabrainsspringbootstarter/hello/HelloController.java - Spring Tool Suite - /Users/kkothagai/Documents/springboot

javabrainss.io

The screenshot shows the Spring Tool Suite interface. The left panel is the Package Explorer, displaying the project structure for 'course-api [boot]'. The 'src/main/java' folder contains packages 'io.javabrainsspringbootstarter' and 'io.javabrainsspringbootstarter.hello', with 'HelloController.java' selected. The right panel shows the code editor for 'HelloController.java':

```
package io.javabrainsspringbootstarter.hello;  
  
@RestController  
public class HelloController {  
}
```

The bottom left panel shows the Servers view, indicating a Pivotal tc Server Developer Edition v3.1 instance is stopped.

Quick Access | Spring

Package Explorer CourseApiApp.java HelloController.java

course-api [boot]
src/main/java
io.javabrainsspringbootstarter
io.javabrainsspringbootstarter.hello
HelloController.java
src/main/resources
src/test/java
src/test/resources
JRE System Library [JavaSE-1.8]
Maven Dependencies
src
target
pom.xml
Servers

Servers Boot Dashboard

Pivotal tc Server Developer Edition v3.1 [Stop]

Writable Smart Insert 3 : 10

Spring - course-api/src/main/java/io/javabrains/springbootstarter/hello/HelloController.java - Spring Tool Suite - /Users/kkothagai/Documents/springboot

javabrains.io

The screenshot shows the Spring Tool Suite interface. In the center-right, there is a code editor window for 'HelloController.java' which contains the following code:

```
package io.javabrains.springbootstarter.hello;
```

Below the package declaration, there is a red squiggle under the annotation `@RestController`. A tooltip box is displayed, containing the error message: "RestController cannot be resolved to a type". It also lists "4 quick fixes available:":

- Import 'RestController' (org.springframework.web.bind.annotation)
- Create annotation 'RestController'
- Change to 'RestControllerAdvice' (org.springframework.web.bind.annotation)
- Fix project setup...

At the bottom of the screen, there is a status bar with the message "RestController cannot be resolved to a type".

On the left side, the "Package Explorer" view shows the project structure:

- course-api [boot]
 - src/main/java
 - io.javabrains.springbootstarter
 - io.javabrains.springbootstarter.hello
 - HelloController.java
 - src/main/resources
 - src/test/java
 - src/test/resources
 - JRE System Library [JavaSE-1.8]
 - Maven Dependencies
 - src
 - target
 - pom.xml
- Servers

At the bottom left, there is a "Servers" view showing "Pivotal tc Server Developer Edition v3.1 [Stop]".

Spring - course-api/src/main/java/io/javabrainsspringbootstarter/hello/HelloController.java - Spring Tool Suite - /Users/kkothagai/Documents/springboot

javabrainss.io

The screenshot shows the Spring Tool Suite interface. On the left, the Package Explorer view displays the project structure for 'course-api [boot]'. The 'src/main/java' folder contains packages 'io.javabrainsspringbootstarter' and 'io.javabrainsspringbootstarter.hello', with 'HelloController.java' selected. The HelloController.java code is shown in the central editor:

```
package io.javabrainsspringbootstarter.hello;  
  
import org.springframework.web.bind.annotation.RestController;  
  
@RestController  
public class HelloController {  
  
    @RequestMapping  
    public String sayHi() {  
        return "Hi";  
    }  
}
```

Below the editor, the Servers view shows a Pivotal tc Server Developer Edition v3.1 instance named 'Pivotal tc Server Developer Edition v3.1 [Stop]'.

Spring - course-api/src/main/java/io/javabrainsspringbootstarter/hello/HelloController.java - Spring Tool Suite - /Users/kkothagai/Documents/springboot

javabrainsspringbootstarter

Package Explorer CourseApiApp.java HelloController.java

```
package io.javabrainsspringbootstarter.hello;

import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RestController;

@RestController
public class HelloController {

    @RequestMapping
    public String sayHi() {
        return "Hi";
    }
}
```

Servers Boot Dashboard

Pivotal tc Server Developer Edition v3.1 [Stop]

Writable Smart Insert 10 : 15

Spring - course-api/src/main/java/io/javabrainsspringbootstarter/hello/HelloController.java - Spring Tool Suite - /Users/kkothagai/Documents/springboot

javabrainss.io

Package Explorer CourseApiApp.java HelloController.java

```
package io.javabrainsspringbootstarter.hello;

import org.springframework.web.bind.annotation.RestController;

@RestController
public class HelloController {

    @RequestMapping
    P RequestMapping cannot be resolved to a type
    } 5 quick fixes available:
    - Import 'RequestMapping' (org.springframework.web.bind.annotation)
    - Create annotation 'RequestMapping'
    - Change to 'RequestBody' (org.springframework.web.bind.annotation)
    - Change to 'RequestPart' (org.springframework.web.bind.annotation)
    - Fix project setup...
}
```

Servers Boot Dashboard

Pivotal tc Server Developer Edition v3.1 [Stop]

Writable Smart Insert 9 : 15

Spring - course-api/src/main/java/io/javabrainsspringbootstarter/hello/HelloController.java - Spring Tool Suite - /Users/kkothagai/Documents/springboot

javabrainss.io

The screenshot shows the Spring Tool Suite interface. The left panel is the Package Explorer, displaying the project structure for 'course-api'. The main panel shows the code editor for 'HelloController.java'.

```
package io.javabrainsspringbootstarter.hello;  
import org.springframework.web.bind.annotation.RequestMapping;  
import org.springframework.web.bind.annotation.RestController;  
  
@RestController  
public class HelloController {  
    @RequestMapping("/hello")  
    public String sayHi() {  
        return "Hi";  
    }  
}
```

The code editor has syntax highlighting and code completion. The bottom left shows the Servers view, which lists 'Pivotal tc Server Developer Edition v3.1 [Stop]'. The bottom right shows the status bar with 'Writable', 'Smart Insert', and '9:11'.

Package Explorer CourseApiA Console Markers Progress

No consoles to display at this time.

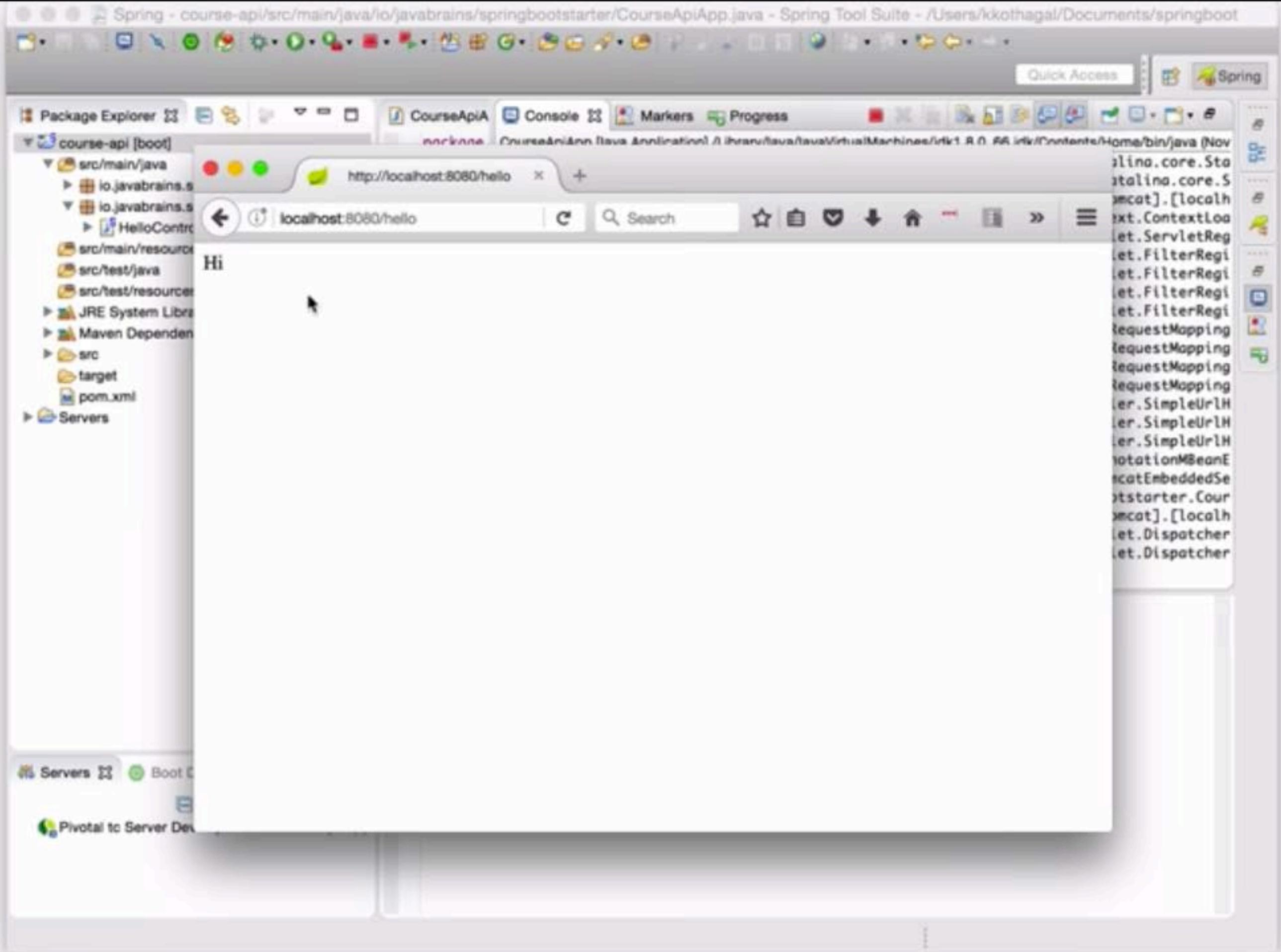
```
course-api [boot]
src/main/java
    io.javabrainss.springbootstarter
        io.javabrainss.springbootstarter.hello
            HelloController.java
    src/main/resources
    src/test/java
    src/test/resources
JRE System Library [JavaSE-1.8]
Maven Dependencies
src
target
pom.xml
Servers
```

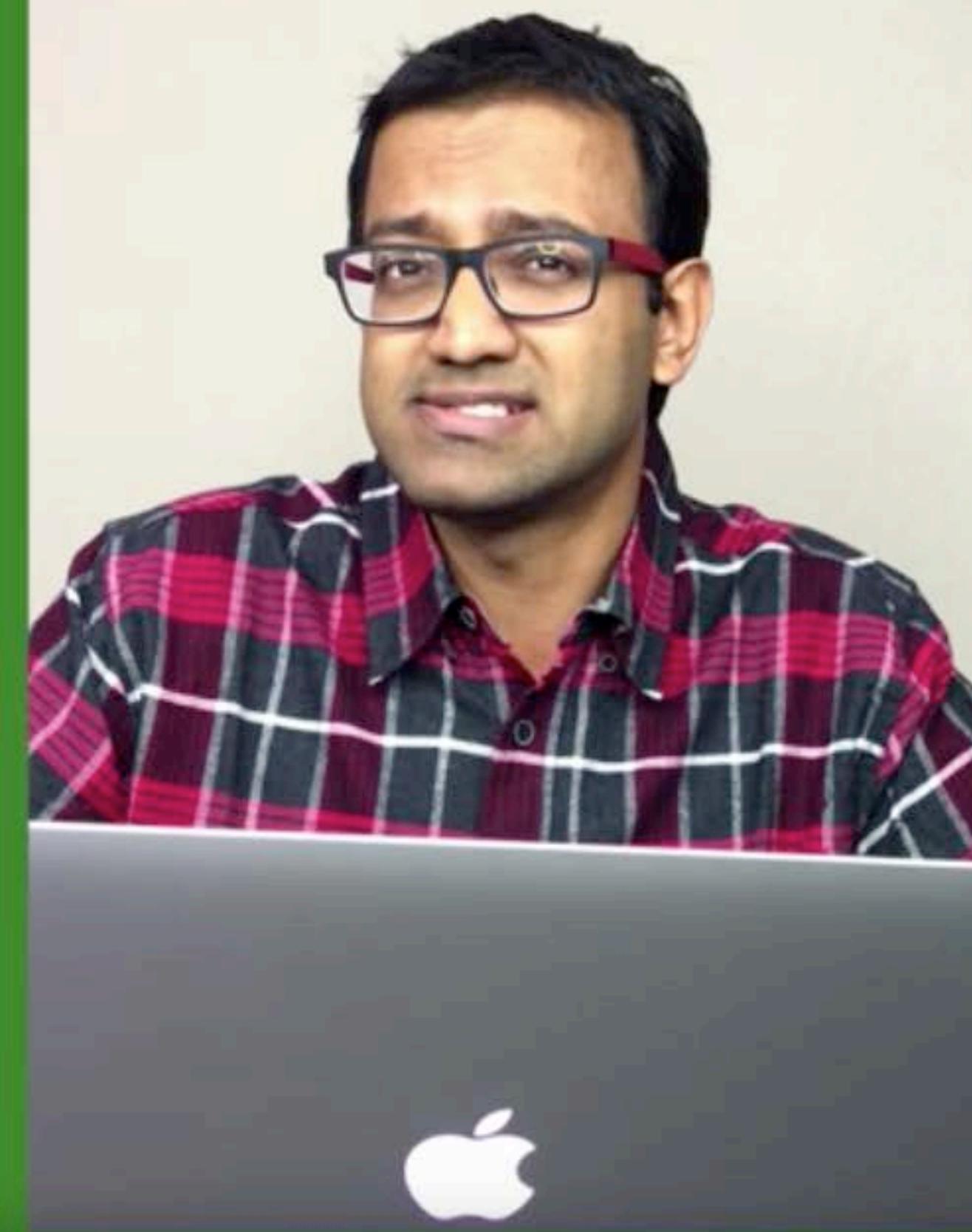
CourseApiA

```
package io.javabrainss.springbootstarter.hello;
import org.springframework.web.bind.annotation.RestController;
@RestController
public class HelloController {
}
```

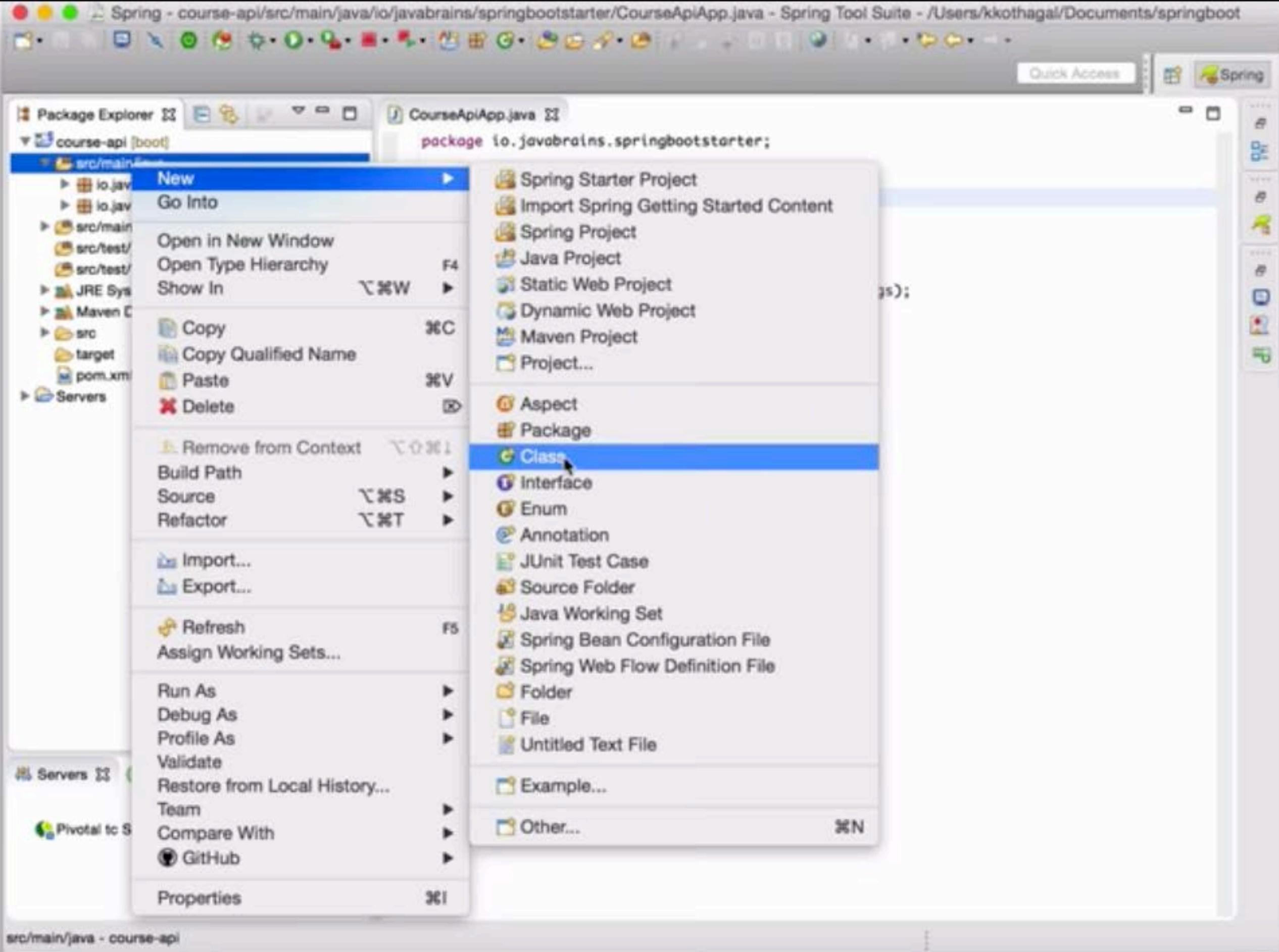
Servers Boot Dashboard

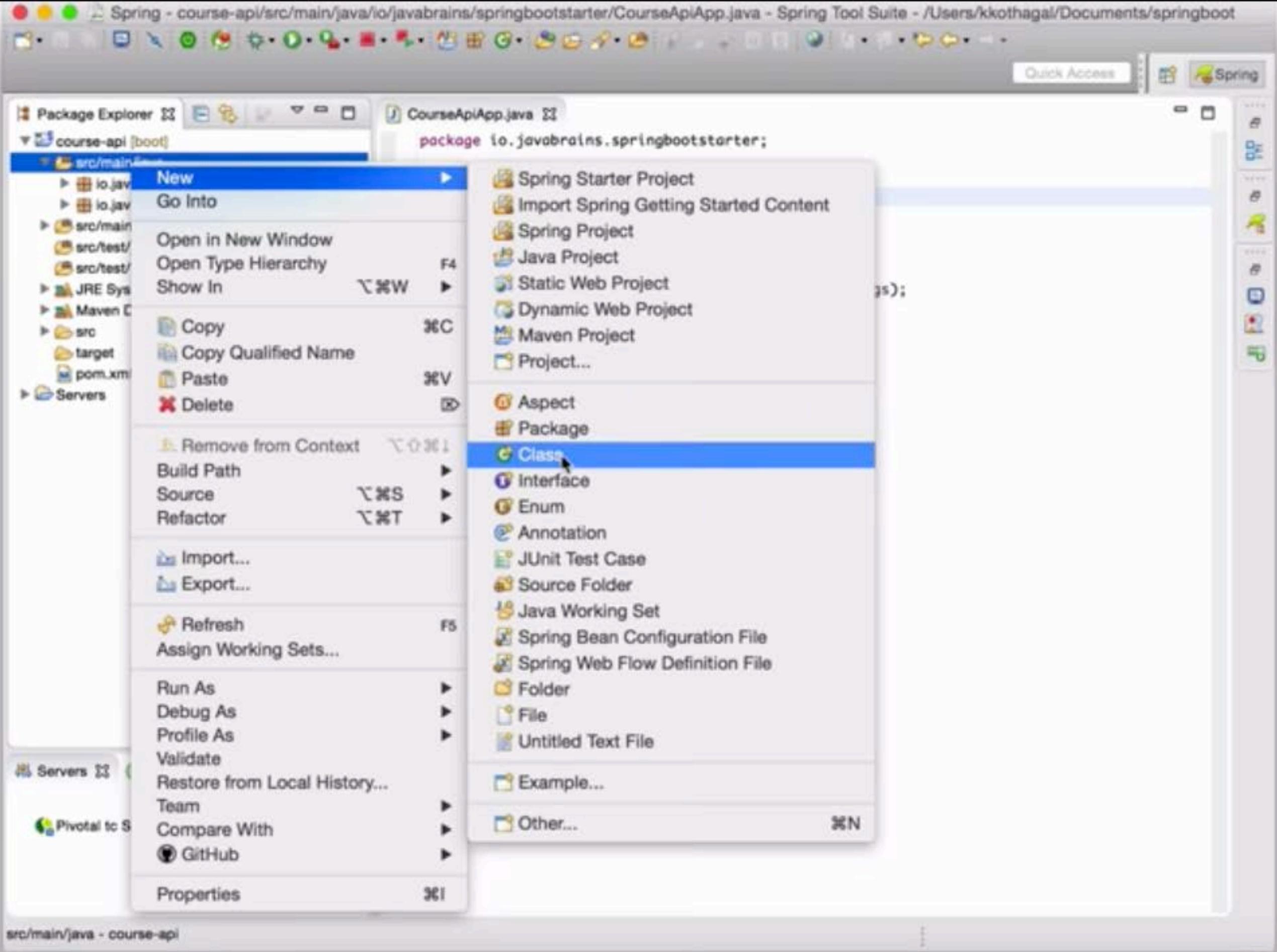
Pivotal tc Server Developer Edition v3.1 [Stop]

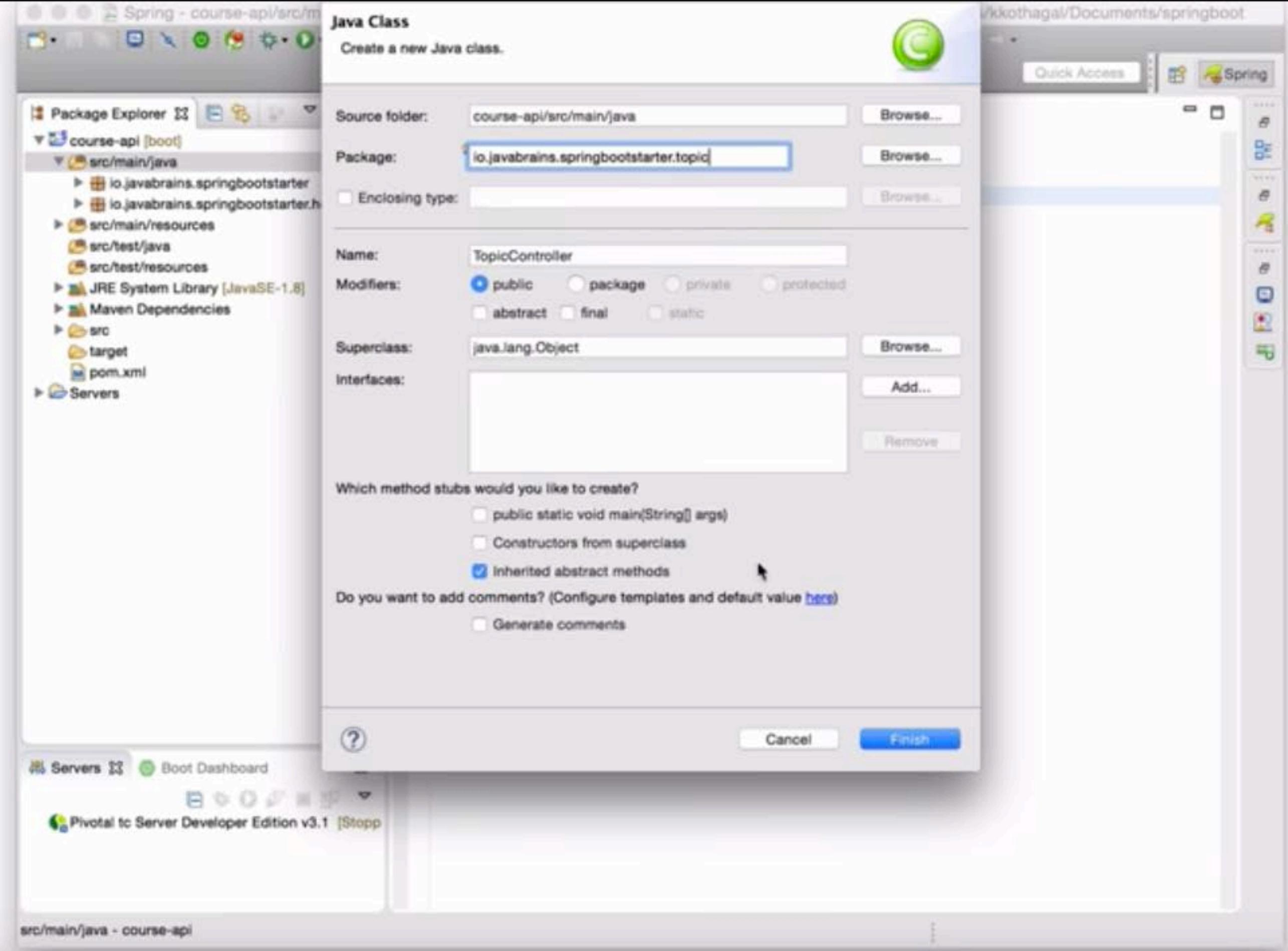




More controller mappings







Spring - course-api/src/main/java/io/javabrainsspringbootstarter/topic/TopicController.java - Spring Tool Suite - /Users/kkothagal/Documents/springboot

javabrainsspringbootstarter

Package Explorer CourseApiApp.java TopicController.java

```
package io.javabrainsspringbootstarter.topic;

public class TopicController {
```

Servers Pivotal tc Server Developer Edition v3.1 [Stop]

Writable Smart Insert 4 : 1

Spring - course-api/src/main/java/io/javabrainsspringbootstarter/topic/TopicController.java - Spring Tool Suite - /Users/kkothagal/Documents/springboot

javabrainsspringbootstarter

Package Explorer CourseApiApp.java TopicController.java

```
package io.javabrainsspringbootstarter.topic;

import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RestController;

@RestController
public class TopicController {

    @RequestMapping("/topics")
    public String getAllTopics() {
        return "All Topics";
    }
}
```

Servers Boot Dashboard

Pivotal tc Server Developer Edition v3.1 [Stop]

Writable Smart Insert 9 : 29

Spring - course-api/src/main/java/io/javabrainsspringbootstarter/topic/Topic.java - Spring Tool Suite - /Users/kkothagal/Documents/springboot

javabrainss.io

The screenshot shows the Spring Tool Suite interface. The left side features the Package Explorer with the project structure:

- course-api [boot]
- src/main/java
 - io.javabrainsspringbootstarter
 - io.javabrainsspringbootstarter.hello
 - io.javabrainsspringbootstarter.topic
 - Topic.java
 - TopicController.java
- src/main/resources
- src/test/java
- src/test/resources
- JRE System Library [JavaSE-1.8]
- Maven Dependencies
- src
- target
- pom.xml

The right side displays the Topic.java file content:

```
package io.javabrainsspringbootstarter.topic;

public class Topic { }
```

Below the editor is the Servers view, which lists:

- Pivotal tc Server Developer Edition v3.1 [Stop]

At the bottom, the status bar shows: Writable, Smart insert, and 3 : 21.

Spring - course-api/src/main/java/io/javabrainsspringbootstarter/topic/Topic.java - Spring Tool Suite - /Users/kkothagal/Documents/springboot

javabrainsspringbootstarter

Package Explorer CourseApiApp.java TopicController.java Topic.java

```
package io.javabrainsspringbootstarter.topic;

public class Topic {

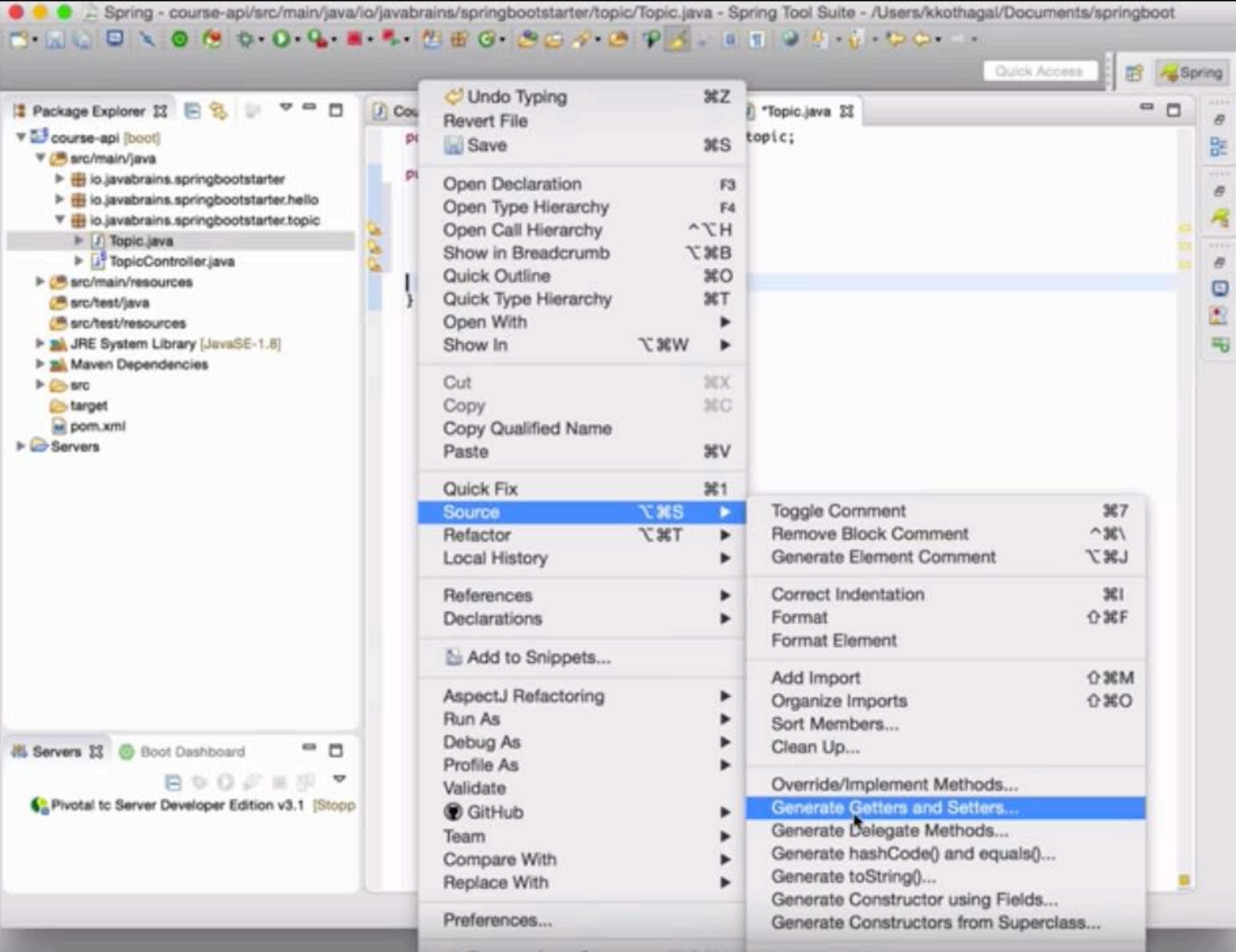
    private String id;
    private String name;
    private String description;
}
```

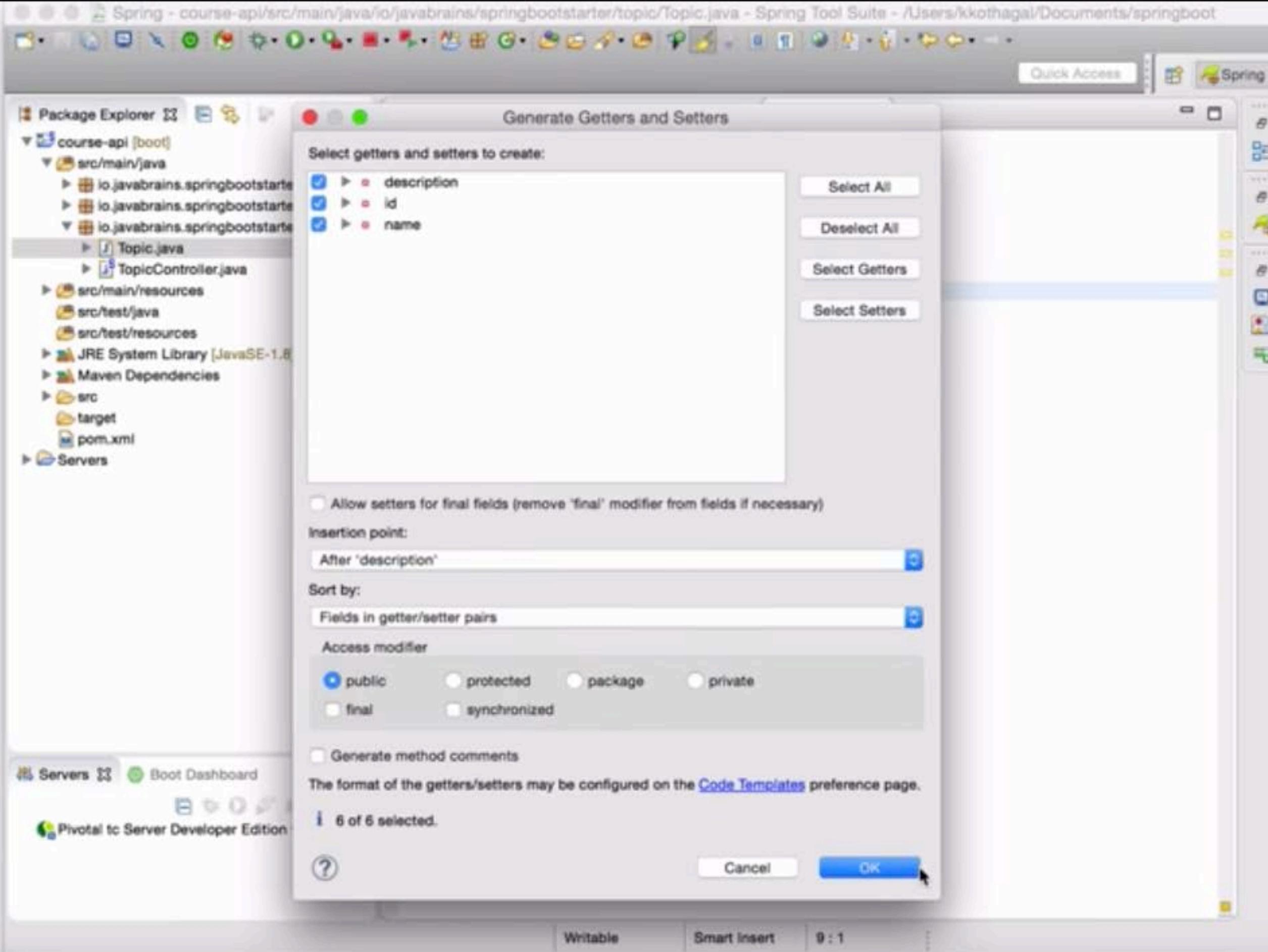
Servers Boot Dashboard

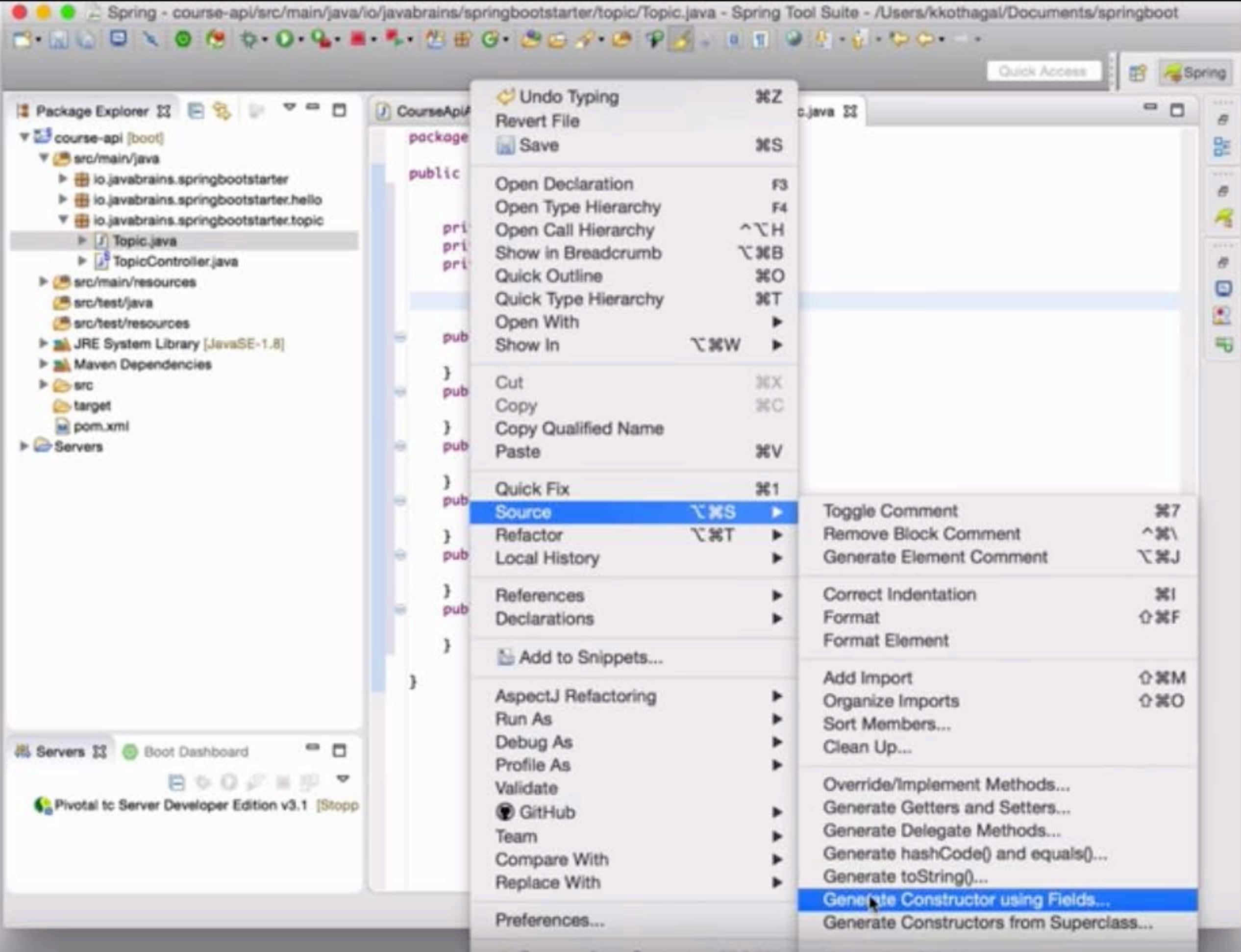
Pivotal tc Server Developer Edition v3.1 [Stop]

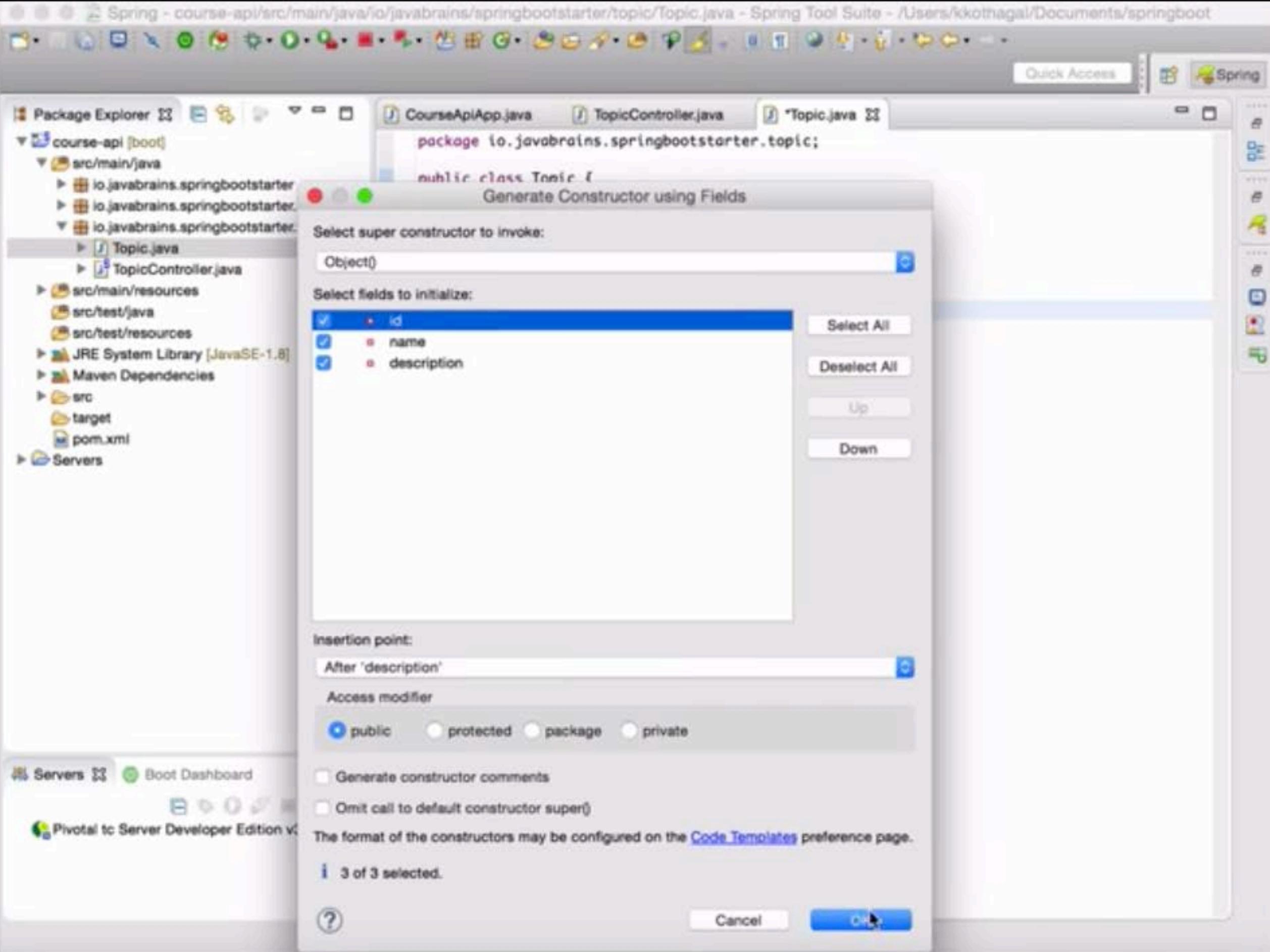
Writable Smart Insert 8:31

This screenshot shows the Spring Tool Suite (STS) interface. The top bar displays the project path: 'Spring - course-api/src/main/java/io/javabrainsspringbootstarter/topic/Topic.java - Spring Tool Suite - /Users/kkothagal/Documents/springboot'. A green banner at the top right says 'javabrainsspringbootstarter'. The main window has three tabs in the title bar: 'CourseApiApp.java', 'TopicController.java', and 'Topic.java'. The 'Topic.java' tab is active, showing Java code for a 'Topic' class with fields for id, name, and description. On the left, the 'Package Explorer' shows the project structure under 'course-api [boot]'. The 'Servers' view at the bottom shows a single server entry: 'Pivotal tc Server Developer Edition v3.1 [Stop]'. The bottom status bar indicates the code is 'Writable' and the time is '8:31'.









Spring - course-api/src/main/java/io/javabrainsspringbootstarter/topic/Topic.java - Spring Tool Suite - /Users/kkothagal/Documents/springboot

javabrainsspringbootstarter

Package Explorer CourseApiApp.java TopicController.java Topic.java

```
package io.javabrainsspringbootstarter.topic;

public class Topic {

    private String id;
    private String name;
    private String description;

    public Topic() {
    }

    public Topic(String id, String name, String description) {
        super();
        this.id = id;
        this.name = name;
        this.description = description;
    }

    public String getId() {
        return id;
    }
    public void setId(String id) {
        this.id = id;
    }
    public String getName() {
        return name;
    }
    public void setName(String name) {
        this.name = name;
    }
    public String getDescription() {
        return description;
    }
    public void setDescription(String description) {
        this.description = description;
    }
}
```

Servers Boot Dashboard

Pivotal tc Server Developer Edition v3.1 [Stop]

Writable Smart Insert 13 : 5

Spring - course-api/src/main/java/io/javabrainsspringbootstarter/topic/TopicController.java - Spring Tool Suite - /Users/kkothagal/Documents/springboot

Quick Access Spring

Package Explorer CourseApiApp.java TopicController.java Topic.java

```
package io.javabrainsspringbootstarter.topic;

import java.util.List;

import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RestController;

@RestController
public class TopicController {

    @RequestMapping("/topics")
    public List<Topic> getAllTopics() {
        return "All Topics";
    }
}
```

Servers Boot Dashboard

Pivotal tc Server Developer Edition v3.1 [Stop]

Writable Smart Insert 17 : 1

The screenshot shows the Spring Tool Suite (STS) interface. In the center, the code editor displays the `TopicController.java` file. The code defines a `TopicController` class with a single endpoint mapped to `/topics` that returns the string "All Topics". The `Topic` class is also visible in the editor. On the left, the `Package Explorer` shows the project structure under `course-api [boot]`, including `src/main/java` with `io.javabrainsspringbootstarter`, `io.javabrainsspringbootstarter.hello`, and `io.javabrainsspringbootstarter.topic` packages, and `src/main/resources`. At the bottom, the `Servers` view shows a Pivotal tc Server instance.

Spring - course-api/src/main/java/io/javabrainsspringbootstarter/topic/TopicController.java - Spring Tool Suite - /Users/kkothagal/Documents/springboot

javabrainsspringbootstarter

Package Explorer CourseApiApp.java TopicController.java Topic.java

```
package io.javabrainsspringbootstarter.topic;

import java.util.Arrays;
import java.util.List;

import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RestController;

@RestController
public class TopicController {

    @RequestMapping("/topics")
    public List<Topic> getAllTopics() {
        return Arrays.asList(
            new Topic("spring", "Spring Framework", "Spring Framework Description"),
            new Topic("java", "Core Java", "Core Java Description"),
            new Topic("javascript", "JavaScript", "JavaScript Description")
        );
    }
}
```

Servers Boot Dashboard

Pivotal tc Server Developer Edition v3.1 [Stop]

Writable Smart Insert 15 : 43

Spring - course-api/src/main/java/io/javabrainsspringbootstarter/topic/TopicController.java - Spring Tool Suite - /Users/kkothagal/Documents/springboot

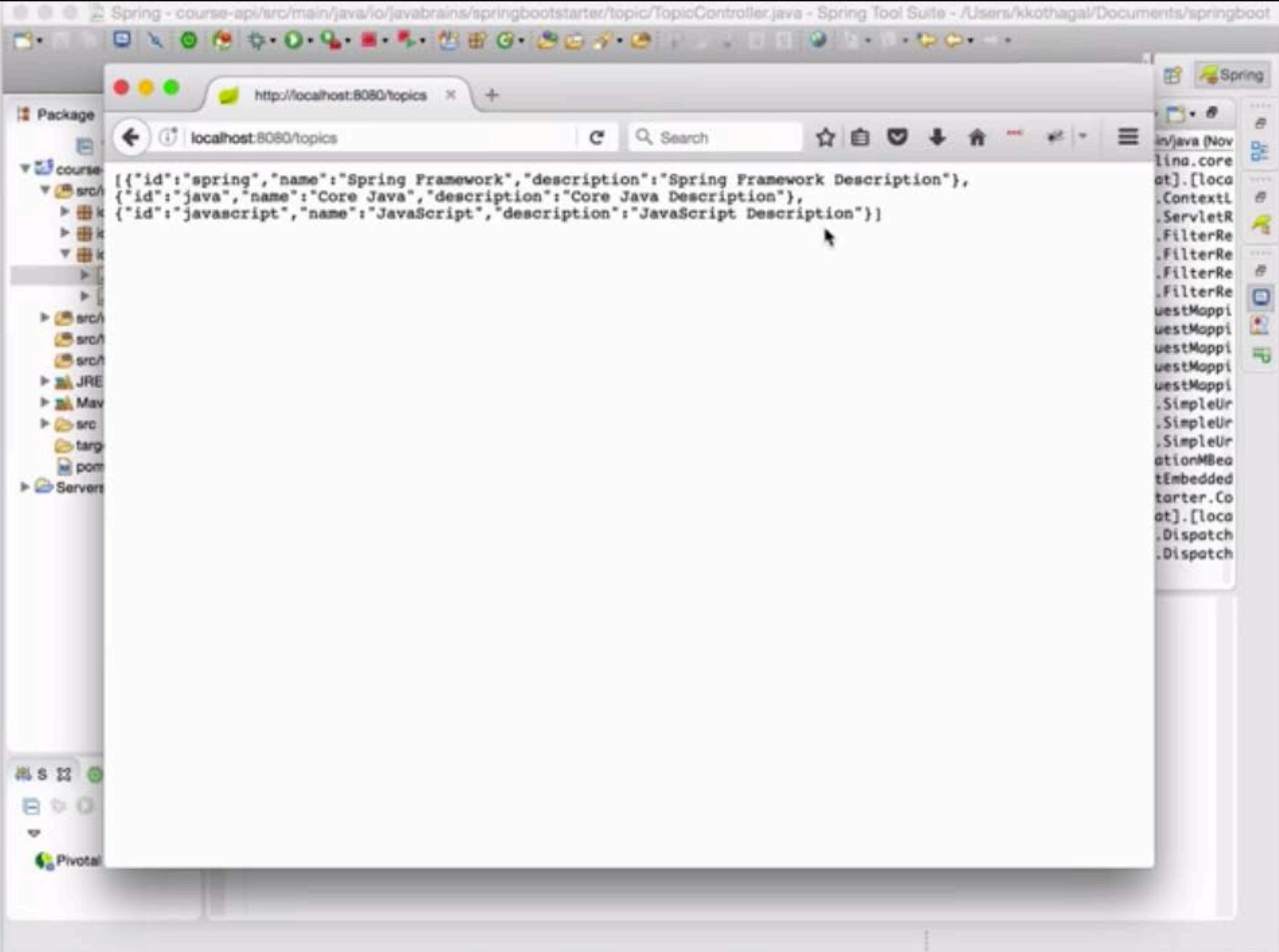
javabrainss.io

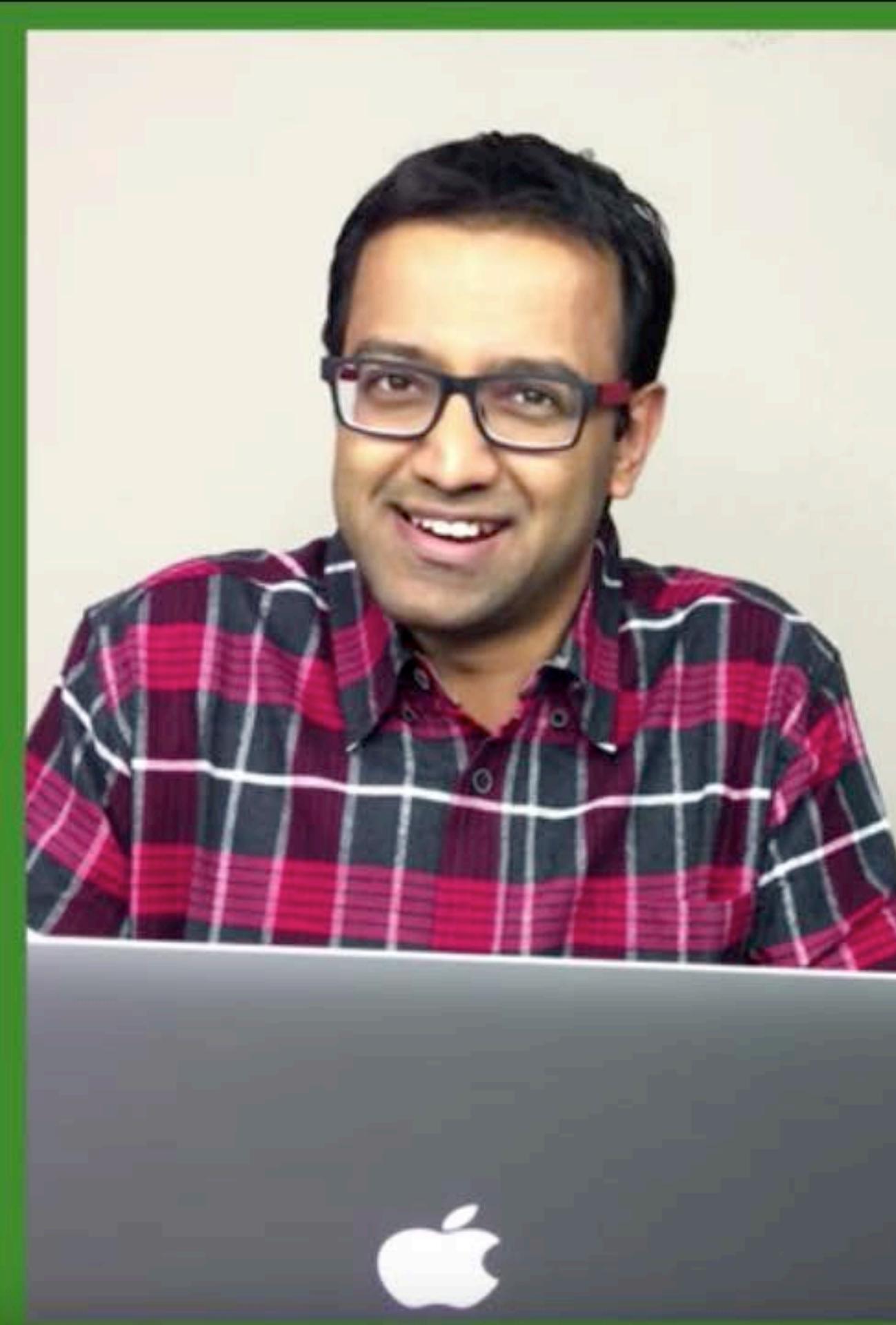
The screenshot shows the Spring Tool Suite interface with the following details:

- Project Explorer (Package View):** Shows the project structure under "course-api [boot]". The "src/main/java" folder contains "io.javabrainsspringbootstarter.topic" package, which has "Topic.java" and "TopicController.java" files selected.
- Code Editor:** Displays the code for "TopicController.java". It includes imports for java.util.Arrays, java.util.List, org.springframework.web.bind.annotation.RestController, and org.springframework.web.bind.annotation.RequestMapping. The controller has a single endpoint mapping to "/topic" that returns a list of topics.
- Console:** Shows the application logs for "CourseApiApp [Java Application]". The log output is as follows:

```
-2016-11-27 13:43:49.951 - INFO 87298 --- [main] o.s.b.c.e.TomcatEmbeddedWebAp
-2016-11-27 13:43:51.099 - INFO 87298 --- [main] o.apache.catalina.core.S
-2016-11-27 13:43:51.111 - INFO 87298 --- [main] o.apache.catalina.core.
-2016-11-27 13:43:51.112 - INFO 87298 --- [main] o.apache.catalina.core.
-2016-11-27 13:43:51.187 - INFO 87298 --- [ost-startStop-1] o.a.c.c.C.[Tomcat].[loco
-2016-11-27 13:43:51.187 - INFO 87298 --- [ost-startStop-1] o.s.web.context.ContextL
-2016-11-27 13:43:51.297 - INFO 87298 --- [ost-startStop-1] o.s.b.w.servlet.ServletR
-2016-11-27 13:43:51.300 - INFO 87298 --- [ost-startStop-1] o.s.b.w.servlet.FilterRe
-2016-11-27 13:43:51.301 - INFO 87298 --- [ost-startStop-1] o.s.b.w.servlet.FilterRe
-2016-11-27 13:43:51.301 - INFO 87298 --- [ost-startStop-1] o.s.b.w.servlet.FilterRe
-2016-11-27 13:43:51.301 - INFO 87298 --- [ost-startStop-1] o.s.b.w.servlet.FilterRe
-2016-11-27 13:43:51.531 - INFO 87298 --- [main] s.w.s.m.m.o.RequestMapping
-2016-11-27 13:43:51.588 - INFO 87298 --- [main] s.w.s.m.m.o.RequestMapping
-2016-11-27 13:43:51.589 - INFO 87298 --- [main] s.w.s.m.m.o.RequestMapping
-2016-11-27 13:43:51.592 - INFO 87298 --- [main] s.w.s.m.m.o.RequestMapping
-2016-11-27 13:43:51.592 - INFO 87298 --- [main] s.w.s.m.m.o.RequestMapping
-2016-11-27 13:43:51.619 - INFO 87298 --- [main] o.s.w.s.handler.SimpleUr
-2016-11-27 13:43:51.619 - INFO 87298 --- [main] o.s.w.s.handler.SimpleUr
-2016-11-27 13:43:51.649 - INFO 87298 --- [main] o.s.w.s.handler.SimpleUr
-2016-11-27 13:43:51.763 - INFO 87298 --- [main] o.s.j.e.a.AnnotationMBean
-2016-11-27 13:43:51.830 - INFO 87298 --- [main] s.b.c.e.TomcatEmbeddedWebAp
-2016-11-27 13:43:51.833 - INFO 87298 --- [main] i.j.springbootstarter.CourseA
```

The bottom left corner of the interface shows the "Pivotal to Server Dev" logo.





What's happening here?

```
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>
    <groupId>io.javabrains.springbootquickstart</groupId>
    <artifactId>course-api</artifactId>
    <version>0.0.1-SNAPSHOT</version>
    <name>Java Brains Course API</name>

    <parent>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-parent</artifactId>
        <version>1.4.2.RELEASE</version>
    </parent>

    <dependencies>
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-web</artifactId>
        </dependency>
    </dependencies>

    <properties>
        <java.version>1.8</java.version>
    </properties>

</project>
```

The screenshot shows the Eclipse IDE interface with the following details:

- Package Explorer View:** Shows the project structure with a tree view. It includes the JRE System Library [JavaSE-1.8] and a Maven Dependencies node containing numerous dependency jars.
- Maven Dependencies View:** A detailed list of the Maven dependencies, including their group ID, artifact ID, version, and path within the local repository.
- course-api/pom.xml Editor View:** The main content area displays the Maven POM XML file. The XML code is color-coded for readability, with tags like <project>, <parent>, <dependencies>, <dependency>, <properties>, and <java.version> highlighted in different colors.
- Servers View:** Shows a single server entry: "Pivotal tc Server Developer Edition v3.1 [Stopped]".
- Toolbar:** Standard Eclipse toolbar icons for file operations, search, and refresh.
- Top Bar:** Includes "Quick Access", "Spring" (with a small icon), and the website "javabrains.io".

The URL "javabrains.io" is also present in the top right corner of the browser window.

```
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <groupId>io.javabrains.springbootquickstart</groupId>
  <artifactId>course-api</artifactId>
  <version>0.0.1-SNAPSHOT</version>
  <name>Java Brains Course API</name>

  <parent>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-parent</artifactId>
    <version>1.4.2.RELEASE</version>
  </parent>

  <dependencies>
    <dependency>
      <groupId>org.springframework.boot</groupId>
      <artifactId>spring-boot-starter-web</artifactId>
    </dependency>
  </dependencies>

  <properties>
    <java.version>1.8</java.version>
  </properties>

</project>
```

Package Explorer course-api/pom.xml

```

<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <groupId>io.javabrains.springbootquickstart</groupId>
  <artifactId>course-api</artifactId>
  <version>0.0.1-SNAPSHOT</version>
  <name>Java Brains Course API</name>

  <parent>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-parent</artifactId>
    <version>1.4.2.RELEASE</version>
  </parent>

  <dependencies>
    <dependency>
      <groupId>org.springframework.boot</groupId>
      <artifactId>spring-boot-starter-web</artifactId>
    </dependency>
  </dependencies>

  <properties>
    <java.version>1.8</java.version>
  </properties>

</project>
```

Servers Pivotal tc Server Developer Edition v3.1 [Stopped]

Overview Dependencies Dependency Hierarchy Effective POM pom.xml

/Users/kkothagal/.m2/repository/org/springframework/spring-aop/4.3.4.RELEASE/spring-aop-4.3.4.RELEASE.jar

Package Explorer course-api/pom.xml

```

<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <groupId>io.javabrains.springbootquickstart</groupId>
  <artifactId>course-api</artifactId>
  <version>0.0.1-SNAPSHOT</version>
  <name>Java Brains Course API</name>

  <parent>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-parent</artifactId>
    <version>1.0.0.RELEASE</version>
  </parent>

  <dependencies>
    <dependency>
      <groupId>org.springframework.boot</groupId>
      <artifactId>spring-boot-starter-web</artifactId>
    </dependency>
  </dependencies>

  <properties>
    <java.version>1.8</java.version>
  </properties>

</project>

```

Servers Boot Dashboard

Pivotal tc Server Developer Edition v3.1 [Stopped]

Overview Dependencies Dependency Hierarchy Effective POM pom.xml

project/#text

Writable Smart Insert 12 : 14

The screenshot shows the Eclipse IDE interface with the following components:

- Package Explorer**: Shows a tree view of project dependencies, including various Spring Boot and Java libraries.
- pom.xml**: The main configuration file for the project, displayed in the central editor area. It defines the project's groupId, artifactId, version, and name, and specifies its parent dependency on the Spring Boot Starter Parent. It also includes sections for dependencies and properties, setting the Java version to 1.8.
- Servers**: A view showing a single server instance: "Pivotal tc Server Developer Edition v3.1 [Stopped]".
- Bottom Status Bar**: Displays the current file path ("project/#text"), the status ("Writable"), and the current time ("12 : 14").

```
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <groupId>io.javabrains.springbootquickstart</groupId>
  <artifactId>course-api</artifactId>
  <version>0.0.1-SNAPSHOT</version>
  <name>Java Brains Course API</name>

  <parent>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-parent</artifactId>
    <version>1.0.0.RELEASE</version>
  </parent>

  <dependencies>
    <dependency>
      <groupId>org.springframework.boot</groupId>
      <artifactId>spring-boot-starter-web</artifactId>
    </dependency>
  </dependencies>

  <properties>
    <java.version>1.8</java.version>
  </properties>

</project>
```

The screenshot shows the STS IDE interface with the following components:

- Package Explorer**: Shows the project structure for "course-api [boot]".
- pom.xml Editor**: Displays the Maven configuration file for the project.
- Servers**: Shows a list of servers, with "Pivotal tc Server Developer Edition v3.1 [Stopped]" currently selected.
- Bottom Navigation Bar**: Includes tabs for Overview, Dependencies, Dependency Hierarchy, Effective POM, and pom.xml, along with status indicators for Writable and Smart Insert, and a timestamp of 13 : 5.

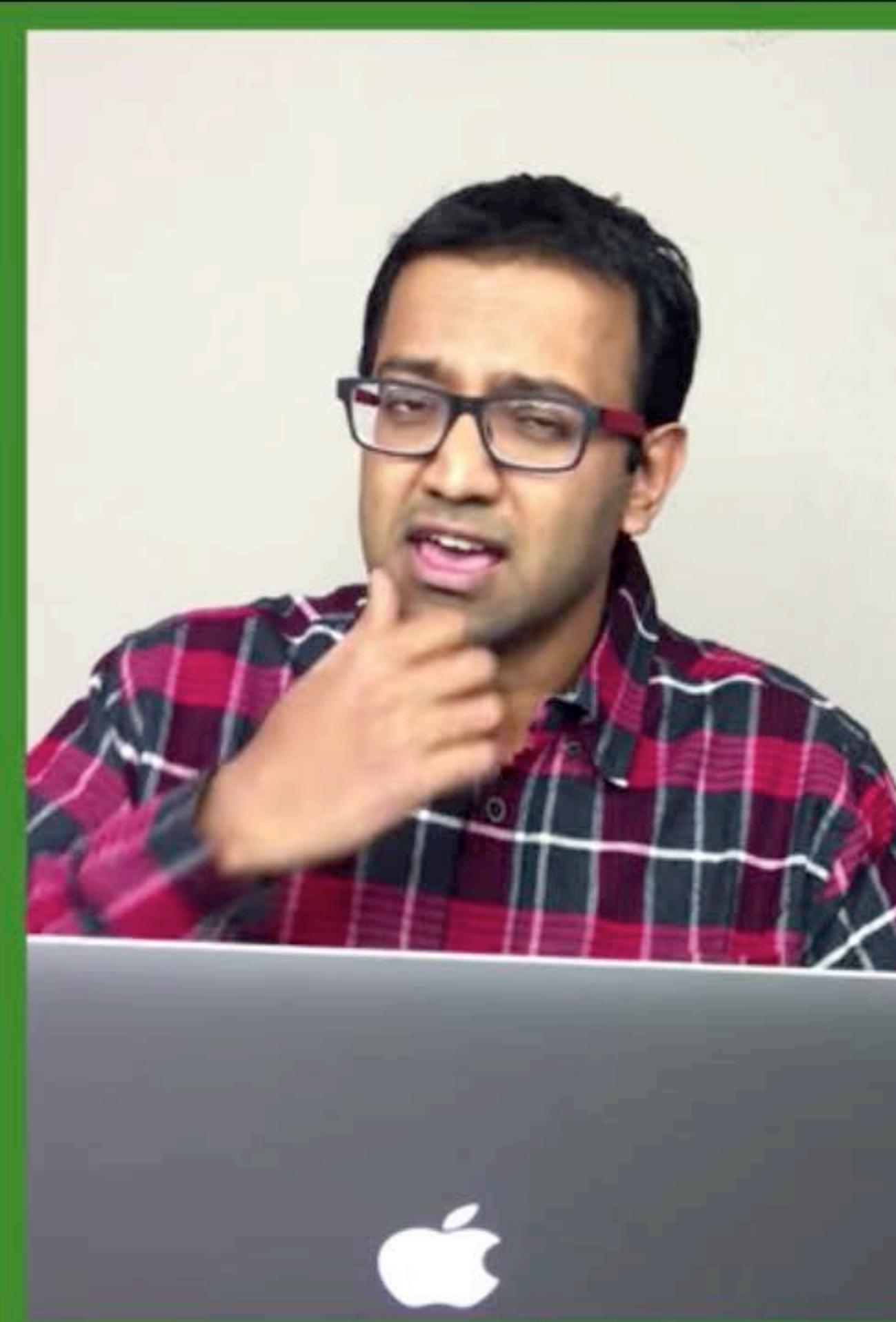
```
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>
    <groupId>io.javabrain.springbootquickstart</groupId>
    <artifactId>course-api</artifactId>
    <version>0.0.1-SNAPSHOT</version>
    <name>Java Brains Course API</name>

    <parent>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-parent</artifactId>
        <version>1.4.2.RELEASE</version>
    </parent>

    <dependencies>
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-web</artifactId>
        </dependency>
    </dependencies>

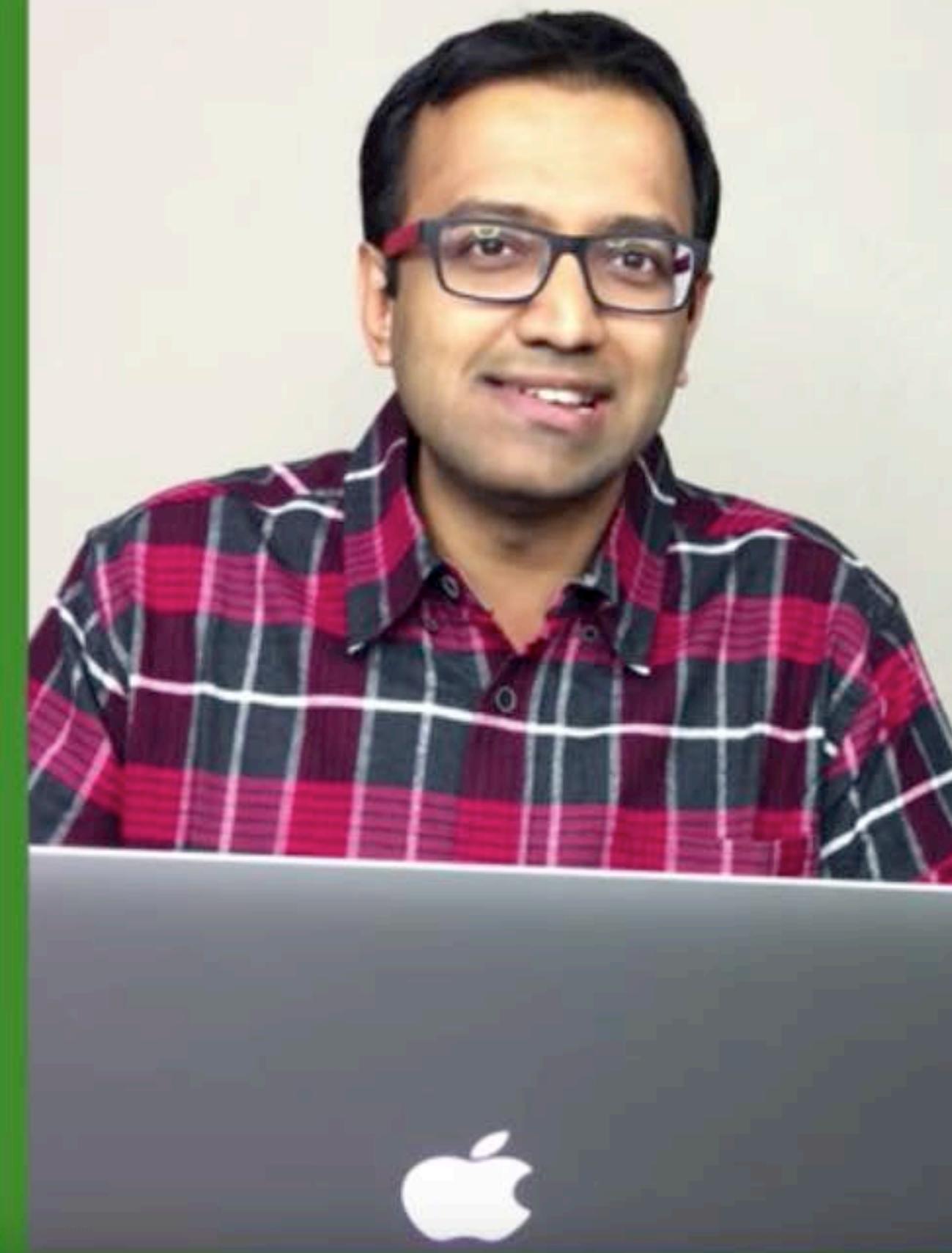
    <properties>
        <java.version>1.8</java.version>
    </properties>

</project>
```



What's happening here?

Bill of materials



What's happening here?

Embedded Tomcat Server

Embedded Tomcat Server

- Convenience
- Servlet container config is now application config
- Standalone application
- Useful for microservices architecture