

# Web API Design with Spring Boot Week 14 Coding Assignment

**Points possible: 75**


**URL to GitHub Repository:** <https://github.com/Brierre/SpringBoot-jeep-sales-repo>

**URL to Public Link of your Video:** <https://rumble.com/v1xcj6e-week-14-video-explanation.html>


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## Instructions :

1. Follow the **Coding Steps** below to complete this assignment.

- In Spring Tool Suite (STS), or an IDE of your choice, write the code that accomplishes the objectives listed below. Ensure that the code compiles and runs as directed.
- Use your existing repo or create a new repository on GitHub for this week's assignment and push your completed code to the repo, including your entire Maven Project Directory (e.g., jeep-sales) and any additional files (e.g. .sql files) that you create. In addition, screenshot your ERD and push the screenshot to your GitHub repo.
- Include the screenshots into this Assignment Document indicated by: 
- Create a video showcasing your work:
  - In this video: record and present your project verbally while showing the results of the working project.
  - Easy way to Create a video: Start a meeting in Zoom, share your screen, open Eclipse with the code and your Console window, start recording & record yourself describing and running the program showing the results.
  - Your video should be a maximum of 5 minutes.
  - Upload your video with a public link.
  - Easy way to Create a Public Video Link: Upload your video recording to YouTube with a public link.

2. In addition, please include the following in your Coding Assignment Document:


- The requested screenshots, indicated by: 
- The URL for this week's GitHub repository.
- The URL of the public link of your video.

3. Save the Coding Assignment Document as a .pdf and do the following:

- Push the .pdf to the GitHub repo for this week.
- Upload the .pdf to the LMS in your Coding Assignment Submission.


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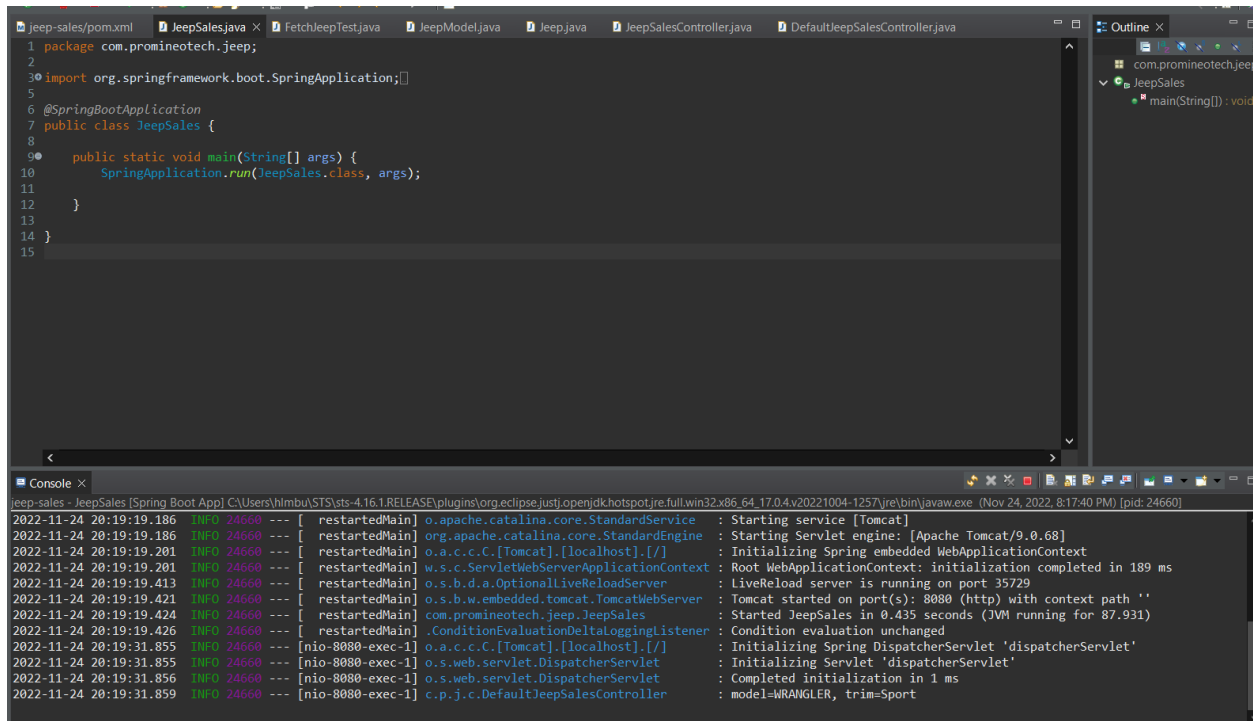
**Here's a friendly tip:** as you watch the videos, code along with the videos. This will help you with the homework. When a screenshot is required, look for the icon:  You will keep adding to this project throughout this part of the course. When it comes time for the final project, use this project as a starter.

**Project Resources:** <https://github.com/promineotech/Spring-Boot-Course-Student-Resources>

## Coding Steps:

- 1) In the project you started last week, use Lombok to add an info-level logging statement in the controller implementation method that logs the parameters that were input to the method. Remember to add the `@Slf4j` annotation to the class.
- 2) Start the application (not an integration test). Use a browser to navigate to the application passing the parameters required for your selected operation. (A browser, used in this manner, sends an HTTP GET request to the server.) Produce a screenshot showing the browser navigation bar and the log statement that is in the IDE console showing that the controller method was reached (as in the video). 

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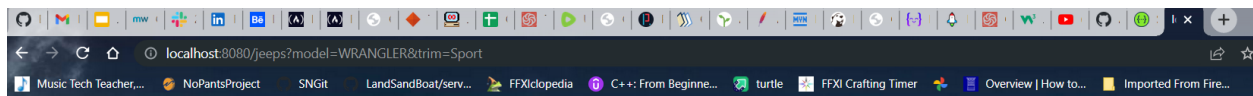
The screenshot shows an IDE with the following components:

- File Explorer:** Shows the project structure with files like `JeepSales.java`, `FetchJeepTest.java`, `JeepModel.java`, `Jeep.java`, `JeepSalesController.java`, and `DefaultJeepSalesController.java`.
- Editor:** Displays the `JeepSales.java` file with the following code:

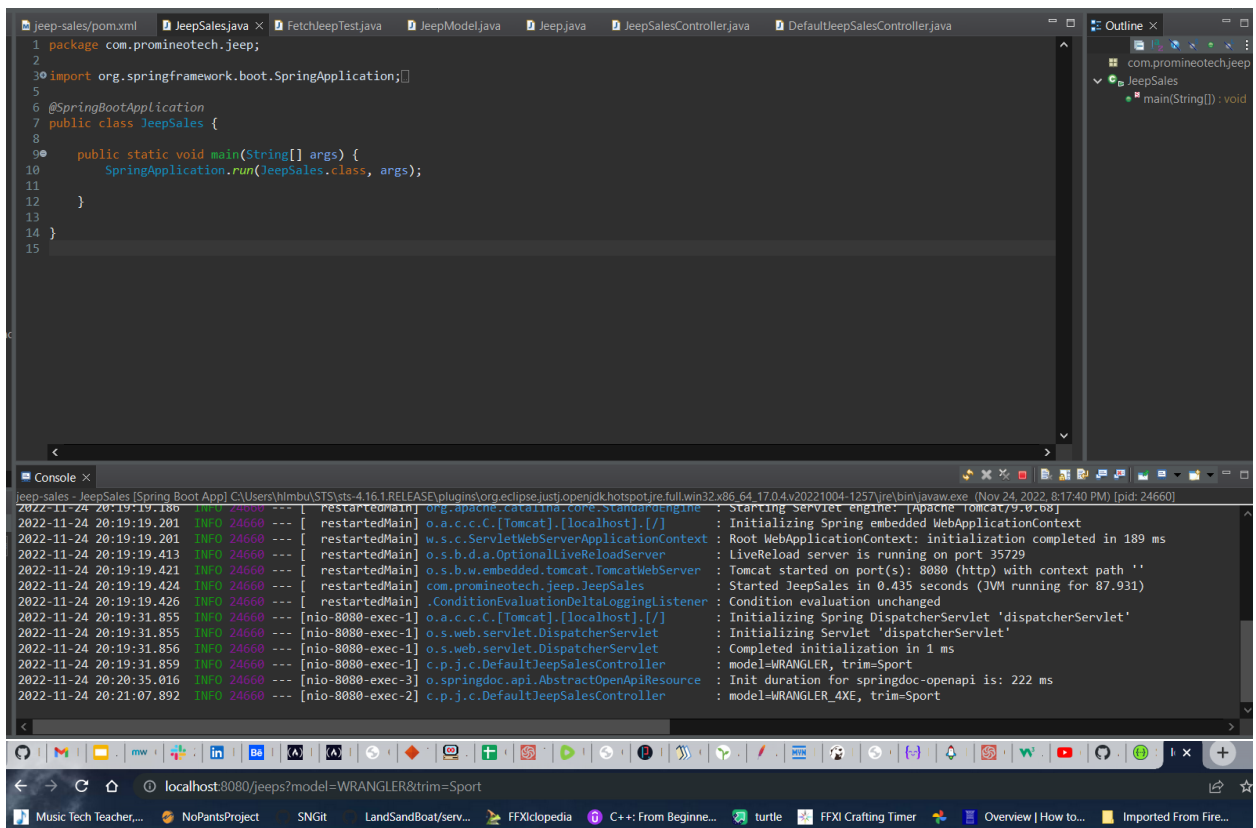
```
1 package com.promineotech.jee;
2
3 import org.springframework.boot.SpringApplication;
4
5 @SpringBootApplication
6 public class JeepSales {
7
8     public static void main(String[] args) {
9         SpringApplication.run(JeepSales.class, args);
10    }
11
12 }
13
14 }
15
```
- Console:** Shows the application startup logs, including Tomcat startup, Spring initialization, and the application running on port 8080.

```
2022-11-24 20:19:19.186 INFO 24660 --- [ restartedMain] o.apache.catalina.core.StandardService : Starting service [Tomcat]
2022-11-24 20:19:19.186 INFO 24660 --- [ restartedMain] org.apache.catalina.core.StandardEngine : Starting Servlet engine: [Apache Tomcat/9.0.68]
2022-11-24 20:19:19.201 INFO 24660 --- [ restartedMain] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring embedded WebApplicationContext
2022-11-24 20:19:19.201 INFO 24660 --- [ restartedMain] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext: initialization completed in 189 ms
2022-11-24 20:19:19.413 INFO 24660 --- [ restartedMain] o.s.b.d.a.OptionalLiveReloadServer : LiveReload server is running on port 35729
2022-11-24 20:19:19.421 INFO 24660 --- [ restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8080 (http) with context path ''
2022-11-24 20:19:19.424 INFO 24660 --- [ restartedMain] com.promineotech.jee.JeepSales : Started JeepSales in 0.435 seconds (JVM running for 87.931)
2022-11-24 20:19:19.426 INFO 24660 --- [ restartedMain] .ConditionEvaluationDeltaLoggingListener : Condition evaluation unchanged
2022-11-24 20:19:31.855 INFO 24660 --- [nio-8080-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring DispatcherServlet 'dispatcherServlet'
2022-11-24 20:19:31.855 INFO 24660 --- [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet : Initializing Servlet 'dispatcherServlet'
2022-11-24 20:19:31.856 INFO 24660 --- [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet : Completed initialization in 1 ms
2022-11-24 20:19:31.859 INFO 24660 --- [nio-8080-exec-1] c.p.j.c.DefaultJeepSalesController : model=WRANGLER, trim=Sport
```

- 3) With the application still running, use the browser to navigate to the OpenAPI documentation. Use the OpenAPI documentation to send a GET request to the server with a valid model and trim level. (You can get the model and trim from the provided `data.sql` file.) Produce a screenshot showing the `curl` command, the request URL, and the response headers.



# Web API Design with Spring Boot Week 14 Coding Assignment



The screenshot displays an IDE with the following components:

- Editors:** Several files are open, including `JeepSales.java`, `FetchJeepTest.java`, `JeepModel.java`, `Jeep.java`, `JeepSalesController.java`, and `DefaultJeepSalesController.java`.
- Code:** The `JeepSales.java` file contains the following code:

```
1 package com.promineotech.jeep;
2
3 import org.springframework.boot.SpringApplication;
4
5 @SpringBootApplication
6 public class JeepSales {
7     public static void main(String[] args) {
8         SpringApplication.run(JeepSales.class, args);
9     }
10 }
11
12
13
14
15
```
- Outline:** The Outline view on the right shows the package structure: `com.promineotech.jeep` containing `JeepSales` with a `main(String[])` method.
- Console:** The console shows the application's startup logs, including the following messages:

```
2022-11-24 20:19:19.180 INFO 24660 --- [ restartedMain] org.apache.catalina.core.StandardEngine : Starting Servlet engine: [Apache Tomcat/9.0.60]
2022-11-24 20:19:19.201 INFO 24660 --- [ restartedMain] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring embedded WebApplicationContext
2022-11-24 20:19:19.413 INFO 24660 --- [ restartedMain] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext: initialization completed in 189 ms
2022-11-24 20:19:19.421 INFO 24660 --- [ restartedMain] o.s.b.d.a.OptionalLiveReloadServer : LiveReload server is running on port 35729
2022-11-24 20:19:19.424 INFO 24660 --- [ restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8080 (http) with context path ''
2022-11-24 20:19:19.426 INFO 24660 --- [ restartedMain] com.promineotech.jeep.JeepSales : Started JeepSales in 0.435 seconds (JVM running for 87.931)
2022-11-24 20:19:19.426 INFO 24660 --- [ restartedMain] .ConditionEvaluationDeltaLoggingListener : Condition evaluation unchanged
2022-11-24 20:19:31.855 INFO 24660 --- [nio-8080-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring DispatcherServlet 'dispatcherServlet'
2022-11-24 20:19:31.855 INFO 24660 --- [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet : Initializing Servlet 'dispatcherServlet'
2022-11-24 20:19:31.856 INFO 24660 --- [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet : Completed initialization in 1 ms
2022-11-24 20:19:31.859 INFO 24660 --- [nio-8080-exec-1] c.p.j.c.DefaultJeepSalesController : model=WRANGLER, trim=Sport
2022-11-24 20:20:35.016 INFO 24660 --- [nio-8080-exec-3] o.springdoc.api.AbstractOpenApiResource : Init duration for springdoc-openapi is: 222 ms
2022-11-24 20:21:07.892 INFO 24660 --- [nio-8080-exec-2] c.p.j.c.DefaultJeepSalesController : model=WRANGLER_4XE, trim=Sport
```
- Browser:** The browser at the bottom shows the URL `localhost:8080/jeeps?model=WRANGLER&trim=Sport`.

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The screenshot displays the Swagger UI for a Jeep API. The top section shows the API definition for the `fetchJeeps` endpoint, which is a GET request to `/jeeps`. The parameters are `model` (string, required) and `trim` (string, required). The UI shows the values `WRANGLER_4XE` and `Sport` entered for these parameters. Below the form, the `Execute` button is highlighted. The `Responses` section shows the server response for the 200 status code, which is a JSON array of Jeep models. The response body is displayed as a JSON object with fields like `modelPK`, `modelId`, `trimLevel`, `numDoors`, `wheelSize`, and `basePrice`. The bottom section shows a list of responses with status codes 200, 400, 404, and 500, each with a description and a media type dropdown set to `application/json`.

**API Definition:**

Name	Description
<b>model</b> <small>required</small>	The model name (i.e. 'WRANGLER')
string (query)	
<b>trim</b> <small>required</small>	The trim level (i.e. 'Sport')
string (query)	

**Execute** **Clear**

**Responses**

**Server response**

Code	Details
200	<p>Response headers</p> <pre>connection: keep-alive content-length: 0 date: Fri, 25 Nov 2022 01:21:07 GMT keep-alive: timeout=60</pre>

**Responses**

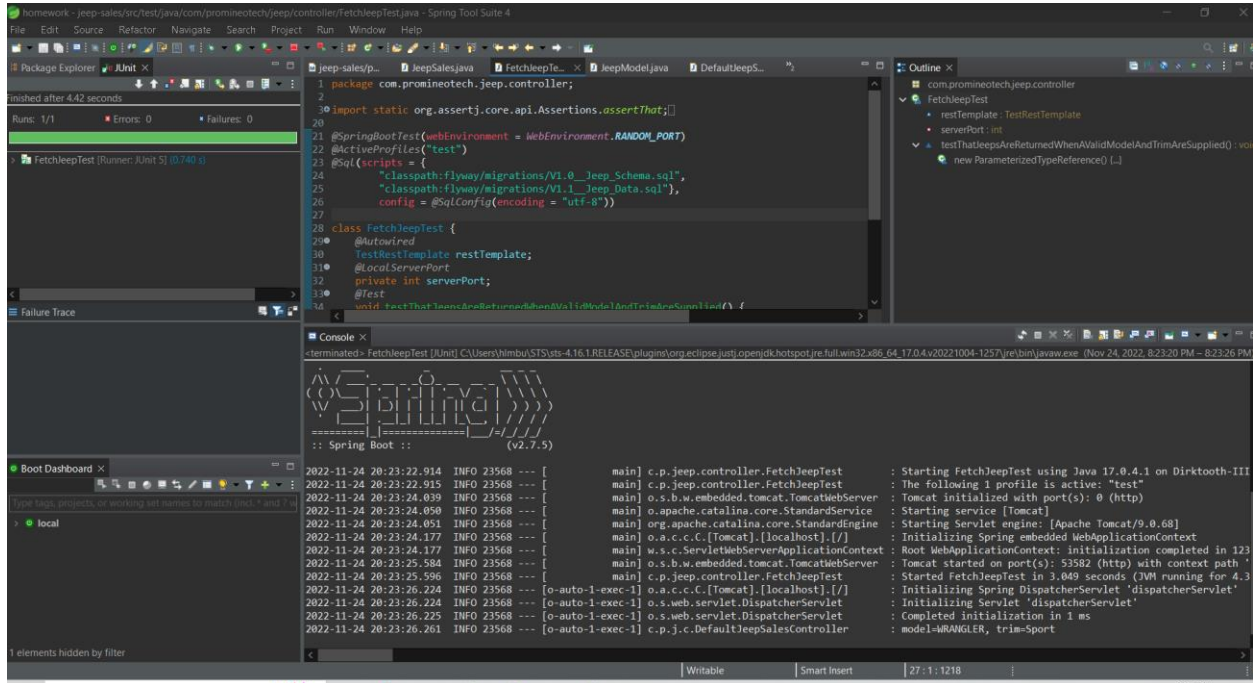
Code	Description	Links
200	A list of Jeeps is returned.	No links
400	The request parameters are invalid.	No links
404	No Jeeps were found with the input criteria.	No links
500	An unplanned error has occurred.	No links

**Schemas**

Jeep >

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- 4) Run the integration test and show that the test status is green. Produce a screenshot of the test class and the status bar.



- 5) Add a method to the test to return a list of expected Jeep (model) objects based on the model and trim level you selected. You can get the expected list of Jeeps from the file src/test/resources/ flyway/migrations/V1.1\_\_Jeep\_Data.sql. So, for example, using the model Wrangler and trim level "Sport", the query should return two rows:

	Row 1	Row 2
Model ID	WRANGLER	WRANGLER
Trim Level	Sport	Sport
Num Doors	2	4


# Web API Design with Spring Boot Week 14 Coding Assignment

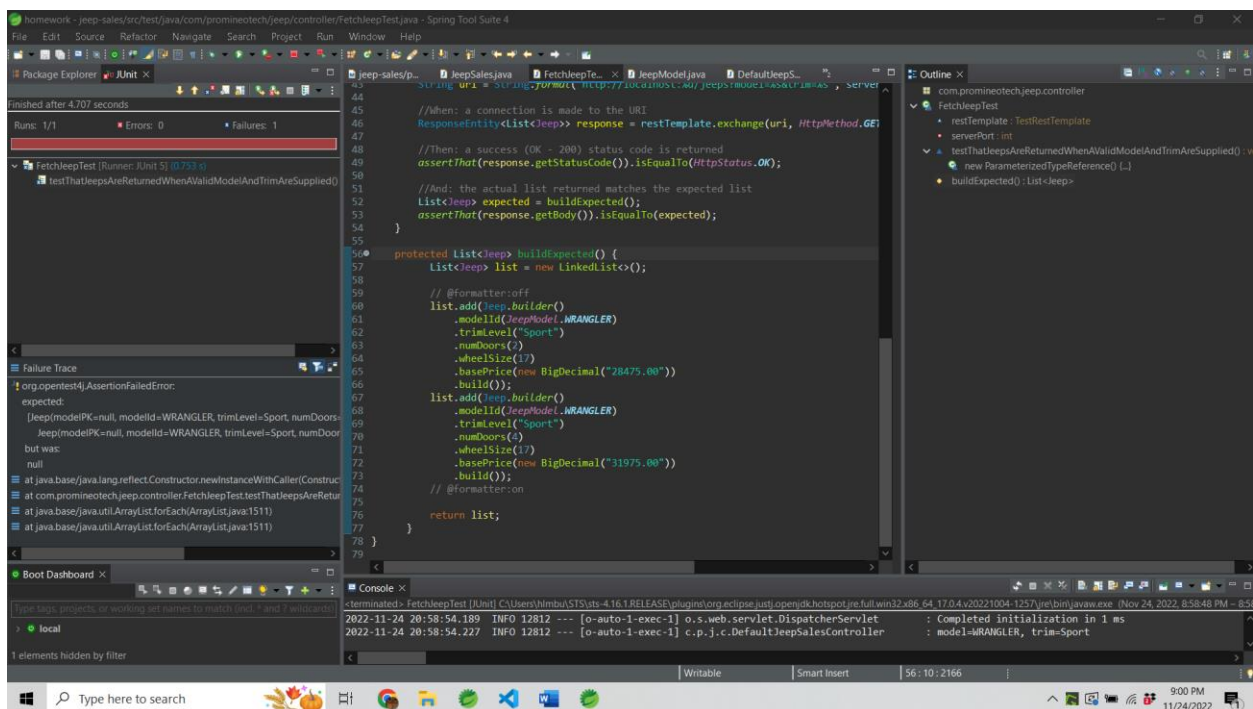
Wheel Size	17	17
Base Price	\$28,475.00	\$31,975.00

6)

The method should be named `buildExpected()`, and it should return a `List` of `Jeep`. The video put this method into a support superclass but you can include it in the main test class if you want.

7) Write an AssertJ assertion in the test to assert that the actual list of jeeps returned by the server is the same as the expected list. Run the test. Produce a screenshot showing...

- The test with the assertion.
- The JUnit status bar (should be red).
- The method returning the expected list of Jeeps. 



The screenshot shows an IDE with the following components:

- JUnit Status Bar:** Shows "Finished after 4.707 seconds", "Runs: 1/1", "Errors: 0", and "Failures: 1".
- Test File:** `FetchJeepTest.java` with the following code:

```
//When: a connection is made to the URL
ResponseEntity<List<Jeep>> response = restTemplate.exchange(uri, HttpMethod.GET);

//Then: a success (OK - 200) status code is returned
assertThat(response.getStatusCode()).isEqualTo(HttpStatus.OK);

//And: the actual list returned matches the expected list
List<Jeep> expected = buildExpected();
assertThat(response.getBody()).isEqualTo(expected);

protected List<Jeep> buildExpected() {
    List<Jeep> list = new LinkedList<>();

    // @formatter:off
    list.add(jeep.builder()
        .modelId(JeepModel.WRANGLER)
        .trimLevel("Sport")
        .numDoors(2)
        .wheelSize(17)
        .basePrice(new BigDecimal("28475.00"))
        .build());
    list.add(jeep.builder()
        .modelId(JeepModel.WRANGLER)
        .trimLevel("Sport")
        .numDoors(4)
        .wheelSize(17)
        .basePrice(new BigDecimal("31975.00"))
        .build());
    // @formatter:on

    return list;
}
```
- Failure Trace:** Shows an `org.opentest4j.AssertionFailedError` with the message: "expected: [Jeep(modelPK=null, modelId=WRANGLER, trimLevel=Sport, numDoors=2, basePrice=28475.00), Jeep(modelPK=null, modelId=WRANGLER, trimLevel=Sport, numDoors=4, basePrice=31975.00)] but was: null".
- Console:** Shows the following output:

```
2022-11-24 20:58:54.189 INFO 12812 --- [o-auto-1-exec-1] o.s.web.servlet.DispatcherServlet : Completed initialization in 1 ms
2022-11-24 20:58:54.227 INFO 12812 --- [o-auto-1-exec-1] c.p.j.c.DefaultJeepSalesController : model=WRANGLER, trim=Sport
```

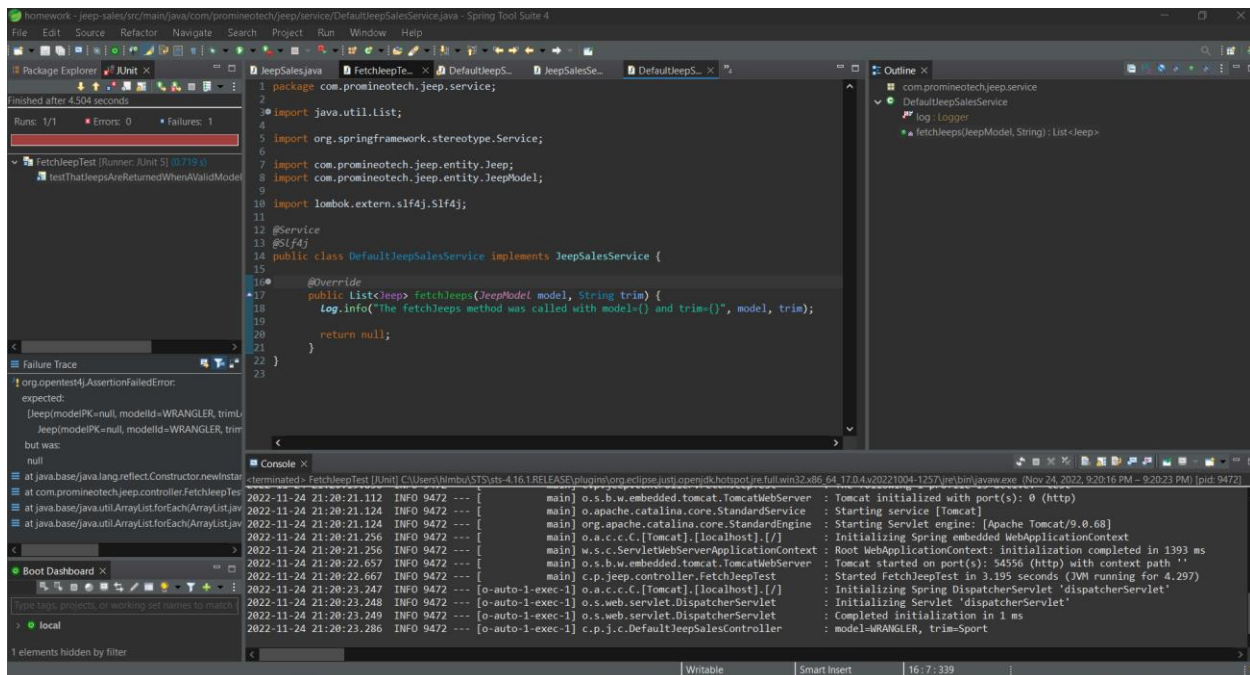
8) Add a service layer in your application as shown in the videos:

- Add a package named `com.promineotech.jeep.service`.
- In the new package, create an interface named `JeepSalesService`.
- In the same package (service), create a class named `DefaultJeepSalesService` that implements the `JeepSalesService` interface. Add the class-level annotation, `@Service`.



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- d) Inject the service interface into DefaultJeepSalesController using the `@Autowired` annotation. The instance variable should be private, and the variable should be named `jeepSalesService`.
- e) Define the `fetchJeeps` method in the interface. Implement the method in the service class. Call the method from the controller (make sure the controller returns the list of Jeeps returned by the service method). The method signature looks like this:  
`List<Jeep> fetchJeeps(JeepModel model, String trim);`
- f) Add a Lombok info-level log statement in the service implementation showing that the service was called. Print the parameters passed to the method. Let the method return `null` for now.
- g) Run the test again. Produce a screenshot showing the service class implementation, the log line in the console, and the red status bar.



- 9) Add the database dependencies described in the video to the POM file (MySQL driver and Spring Boot Starter JDBC). To find them, navigate to <https://mvnrepository.com/>. Search for `mysql-connector-j` and `spring-boot-starter-jdbc`. In the POM file you don't need version numbers for either dependency because the version is included in the Spring Boot Starter Parent.
- 10) Create `application.yaml` in `src/main/resources`. Add the `spring.datasource.url`, `spring.datasource.username`, and `spring.datasource.password` properties to `application.yaml`. The url should be the same as shown in the video (`jdbc:mysql://localhost:3306/jeep`). The password and username should match your setup. If you created the database under your root user, the username is "root", and the password is



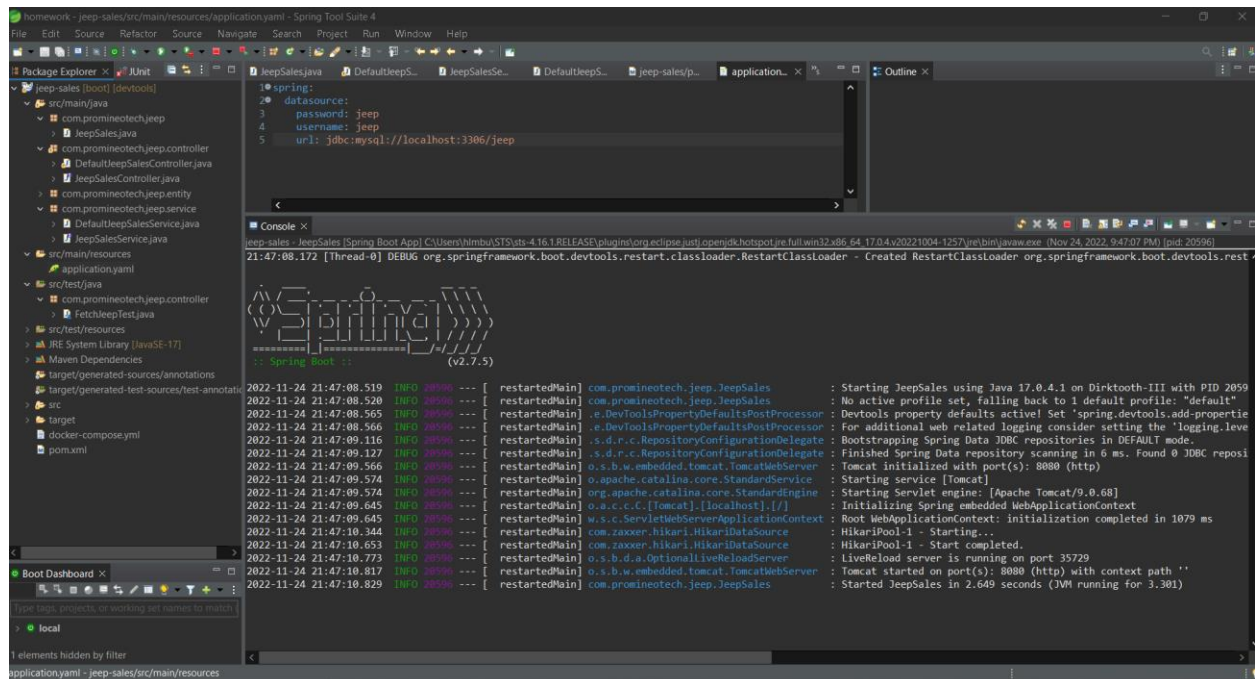
# Web API Design with Spring Boot Week 14 Coding Assignment

the root user password. If you created a "jeep" user or other user, use the correct username and password.

Be careful with the indentation! YAML allows hierarchical configuration but it reads the hierarchy based on the indentation level. The keyword "spring" MUST start in the first column. It should look similar to this when done:

```
spring:
  datasource:
    username: username
    password: password
    url: jdbc:mysql://localhost:3306/jeep
```

- 11) Start the application (the real application, not the test). Produce a screenshot that shows application.yaml and the console showing that the application has started with no errors. 🖥️



- 12) Add the H2 database as dependency. Search for the dependency in the Maven repository like you did above. Search for "h2" and click the latest version. Again, you don't need the version number, but the scope should be set to "test".

- 13) Create application-test.yaml in src/test/resources. Add the setting spring.datasource.url that points to the H2 database. It should look like this:

```
spring:
  datasource:
```

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url: jdbc:h2:mem:jeep;mode=MYSQL

You do not need to set the username and password because the in-memory H2 database does not require them.

Produce a screenshot showing application-test.yaml. 