

Web API Design with Spring Boot Week 14 Coding Assignment


Points possible: 75

URL to GitHub Repository: <https://github.com/Gruber-TK/Spring-Boot-Jeep-Sales->


URL to Public Link of your Video: <https://youtu.be/zX-nU-RXN3g>

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.
-

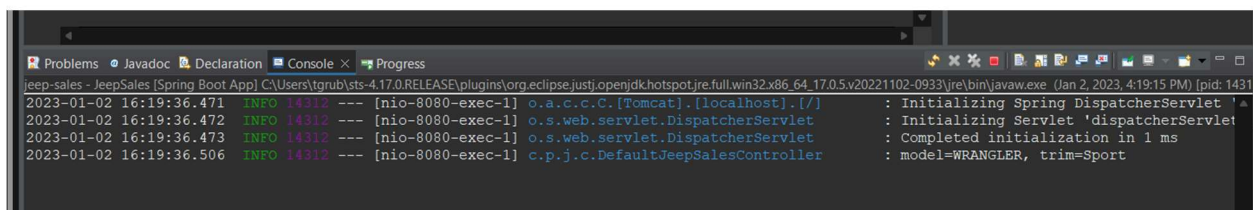
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Here's a friendly tip: as you watch the videos, code along with the videos. This will help you with the homework. When a screenshot is required, look for the icon:  You will keep adding to this project throughout this part of the course. When it comes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



- 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. 

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GET /jeeps Returns a list of Jeeps

Returns a list of Jeeps given an optional model and/or trim

Parameters

Name	Description
model string (query)	The model name (i.e. 'WRANGLER') <input type="text" value="CHEROKEE"/>
trim string (query)	The trim level (i.e. 'Sport') <input type="text" value="Sport"/>

ExecuteClear

Responses

Curl

```
curl -X 'GET' \
  'http://localhost:8080/jeeps?model=CHEROKEE&trim=Sport' \
  -H 'accept: application/json'
```

Request URL

```
http://localhost:8080/jeeps?model=CHEROKEE&trim=Sport
```

Server response

Code	Details
200	<div>Response headers</div> <div><pre>connection: keep-alive content-length: 0 date: Mon, 02 Jan 2023 22:20:57 GMT keep-alive: timeout=60</pre></div>

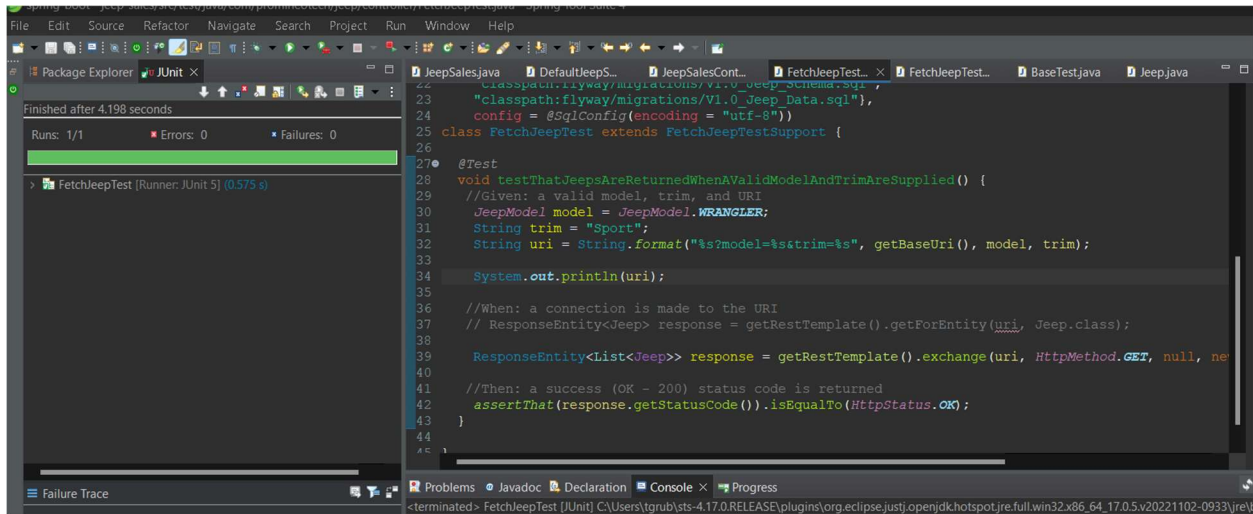
Code	Details
200	<div>Response headers</div> <div><pre>connection: keep-alive content-length: 0 date: Mon, 02 Jan 2023 22:20:57 GMT keep-alive: timeout=60</pre></div>

Responses

Code	Description	Links
200	A list of Jeeps is returned.	No links
	<div>Media type <input type="text" value="application/json"/></div> <div>Controls Accept header.</div> <div>Example Value Schema</div> <div><pre>{ "modelPK": 0, "modelId": "WRANGLER", "trimLevel": "string", "numDoors": 0, "wheelSize": 0, "basePrice": 0 }</pre></div>	
400	The request parameters are invalid.	No links
404	No Jeeps were found with the input criteria.	No links
	<div>Media type <input type="text" value="application/json"/></div>	
500	An unplanned error occurred.	No links
	<div>Media type <input type="text" value="application/json"/></div>	

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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.




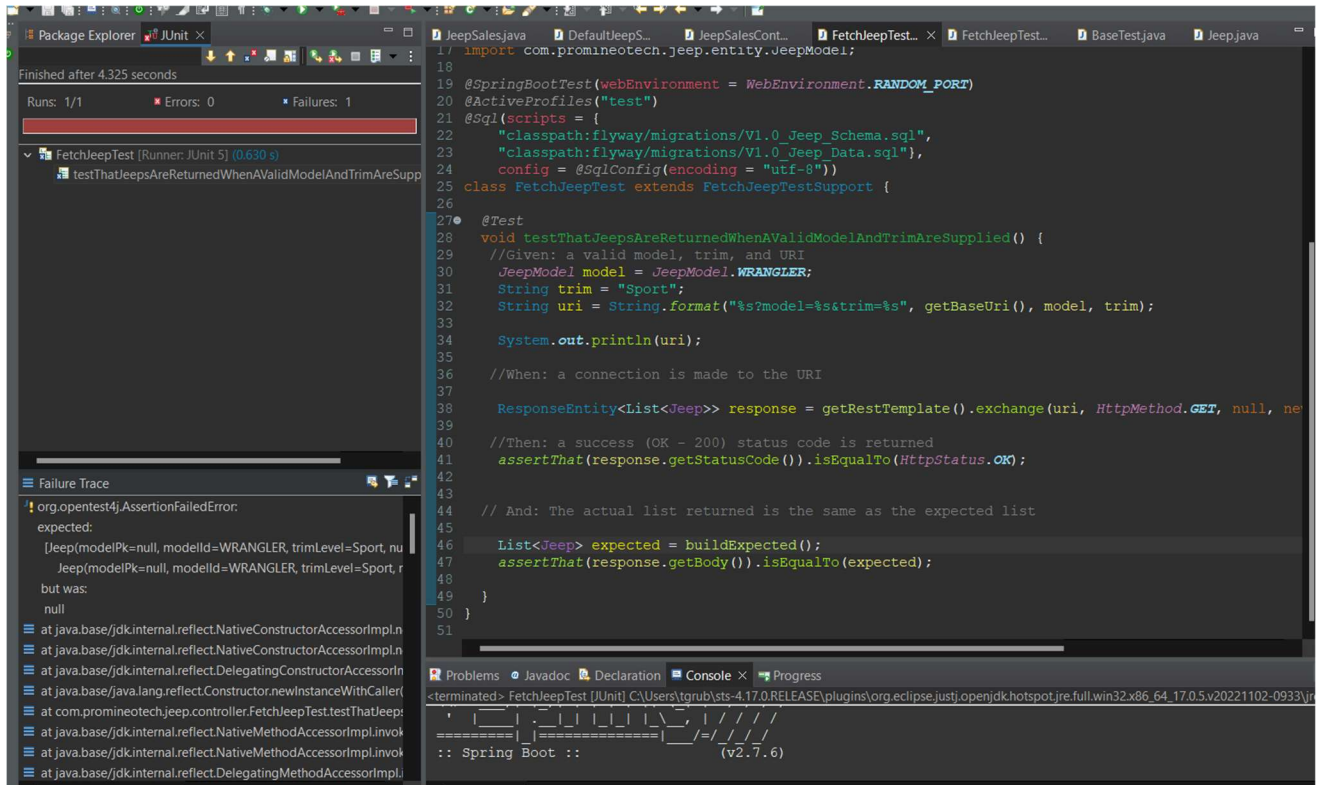
- 5) Add a method to the test to return a list of expected Jeep (model) objects based on the model and trim level you selected. You can get the expected list of Jeeps from the file src/test/resources/flyway/migrations/V1.1__Jeep_Data.sql. So, for example, using the model Wrangler and trim level "Sport",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

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

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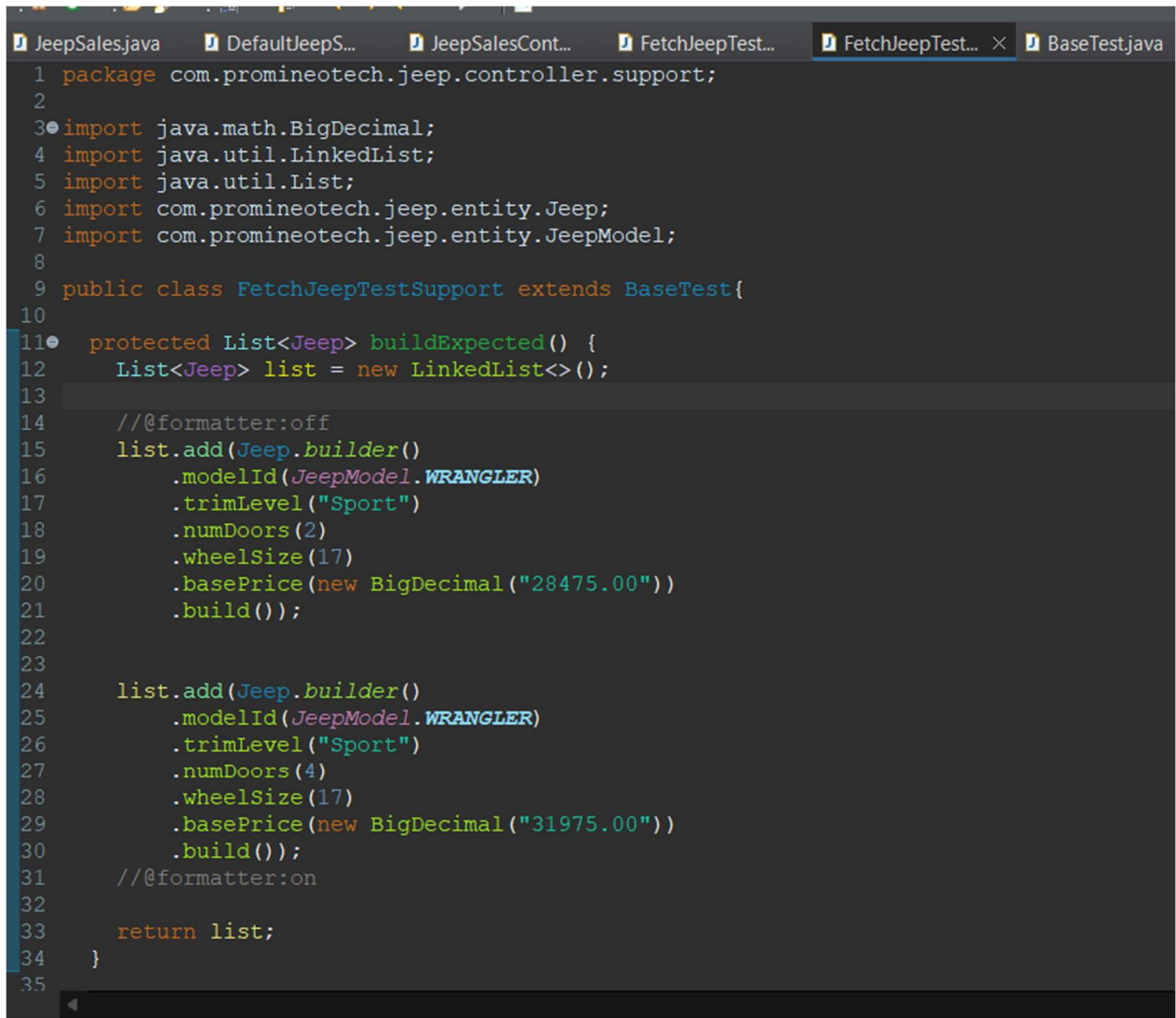
- 7) Write an AssertJ assertion in the test to assert that the actual list of jeeps returned by the server is the same as the expected list. Run the test. Produce a screenshot showing...
- a) The test with the assertion.
 - b) The JUnit status bar (should be red).
 - c) The method returning the expected list of Jeeps. 



The screenshot shows the Eclipse IDE with the following components:

- JUnit Status Bar:** Shows "Runs: 1/1", "Errors: 0", and "Failures: 1". The progress bar is red.
- Test Explorer:** Shows the test "testThatJeepsAreReturnedWhenAValidModelAndTrimAreSupp" under the "FetchJeepTest" runner. The status is "Failed".
- Failure Trace:** Shows the error message: "org.opentest4j.AssertionFailedError: expected: Jeep(modelPk=null, modelId=WRANGLER, trimLevel=Sport, ... but was: null".
- Code Editor:** Shows the source code for "FetchJeepTest.java". The test method "testThatJeepsAreReturnedWhenAValidModelAndTrimAreSupp" is highlighted. It includes an assertion: "assertThat(response.getBody()).isEqualTo(expected);".
- Console:** Shows the output of the test, including the URI "http://localhost:8080/jeeps" and the expected list of jeeps.

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```
1 package com.promineotech.jeeptest.support;
2
3 import java.math.BigDecimal;
4 import java.util.LinkedList;
5 import java.util.List;
6 import com.promineotech.jeeptest.entity.Jeeptest;
7 import com.promineotech.jeeptest.entity.JeeptestModel;
8
9 public class FetchJeepTestSupport extends BaseTest{
10
11     protected List<Jeeptest> buildExpected() {
12         List<Jeeptest> list = new LinkedList<>();
13
14         //@formatter:off
15         list.add(Jeeptest.builder()
16             .modelId(JeeptestModel.WRANGLER)
17             .trimLevel("Sport")
18             .numDoors(2)
19             .wheelSize(17)
20             .basePrice(new BigDecimal("28475.00"))
21             .build());
22
23         list.add(Jeeptest.builder()
24             .modelId(JeeptestModel.WRANGLER)
25             .trimLevel("Sport")
26             .numDoors(4)
27             .wheelSize(17)
28             .basePrice(new BigDecimal("31975.00"))
29             .build());
30         //@formatter:on
31
32         return list;
33     }
34 }
35
```

- 8) Add a service layer in your application as shown in the videos:
- a) Add a package named `com.promineotech.jeeptest.service`.
 - b) In the new package, create an interface named `JeepSalesService`.
 - c) In the same package (service), create a class named `DefaultJeepSalesService` that implements the `JeepSalesService` interface. Add the class-level annotation, `@Service`.
 - 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<Jeeptest> fetchJeeps(JeeptestModel model, String trim);
```


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- 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.

The screenshot shows an IDE with the following components:

- Package Explorer:** Shows the project structure with packages `com.promineotech.jeepp.service` and `com.promineotech.jeepp.controller`.
- DefaultJeepSalesService.java:** Contains the implementation of `JeepSalesService`. The `fetchJeeps` method is implemented as follows:

```
1 package com.promineotech.jeepp.service;
2
3 import java.util.List;
4
5 @Service
6 @Slf4j
7
8 public class DefaultJeepSalesService implements JeepSalesService {
9
10     @Override
11     public List<Jeep> fetchJeeps(String model, String trim) {
12         log.info("The fetchJeeps method was called with model={} and trim={}", model, trim);
13         return null;
14     }
15 }
```
- FetchJeepTest.java:** Contains the test class `FetchJeepTest` with a test method `testThatJeepsAreReturnedWhenAValidModelAndTrimAreSupplied`.
- Console:** Shows the output of the test run. It includes the following log line:

```
main] c.p.jeepp.controller.FetchJeepTest : Starting FetchJeepTest using Java 17.0.5 on DESKTOP-2GH8IH5 with PID 14912 (started by user)
main] c.p.jeepp.controller.FetchJeepTest : Running with Spring Boot v2.7.6, Spring v5.3.24
main] c.p.jeepp.controller.FetchJeepTest : The following 1 profile is active: "test"
main] c.p.jeepp.controller.FetchJeepTest : Started FetchJeepTest in 3.287 seconds (JVM running for 4.682)
-1-exec-1] c.p.j.c.DefaultJeepSalesController : model=WRANGLER, trim=Sport
-1-exec-1] c.p.j.s.DefaultJeepSalesService : The fetchJeeps method was called with model=WRANGLER and trim=Sport
```
- Failure Trace:** Shows the failure details for the test. It indicates that the test failed due to an `AssertionFailedError` because the expected result was `Jeep(modelPk=null, modelId=WRANGLER, trimLevel=Sport, ...)` but the actual result was `null`.

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

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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:

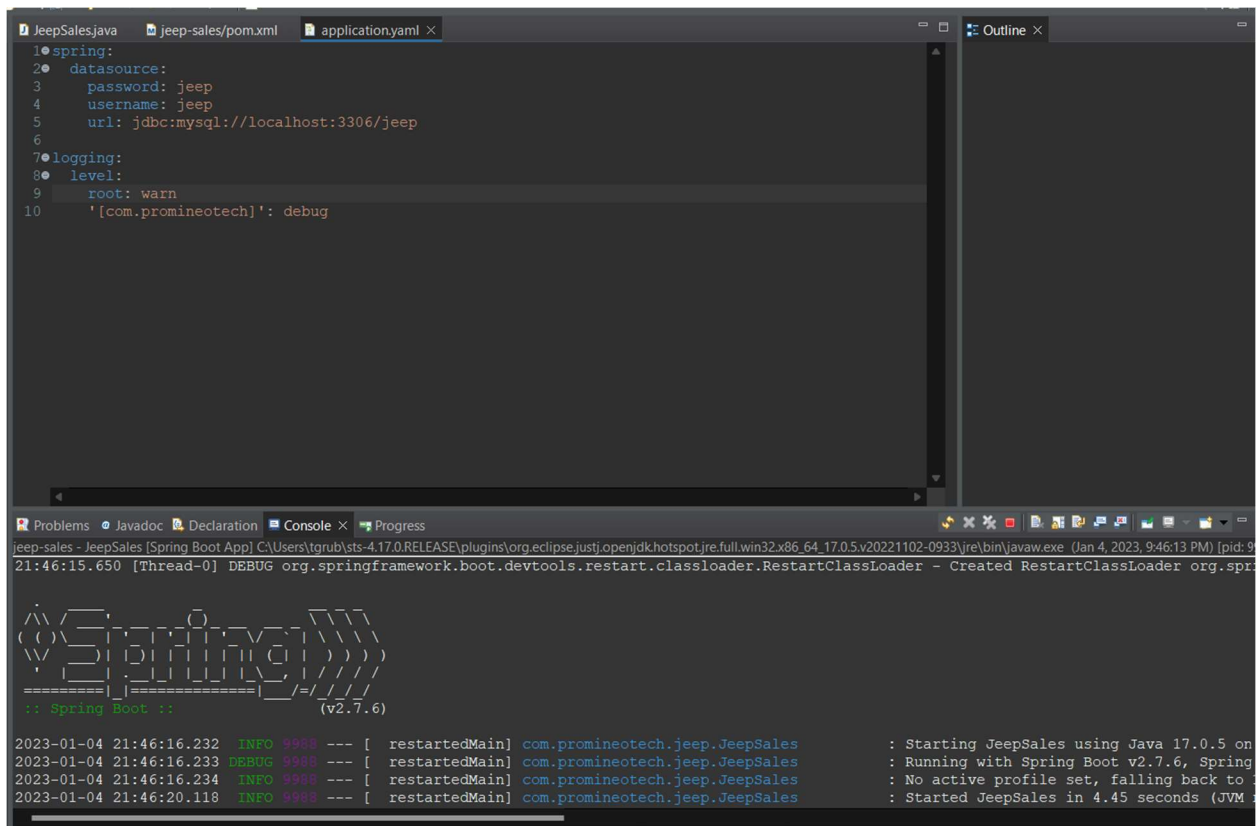
datasource:

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. 



The screenshot shows an IDE with two main panels. The top panel displays the `application.yaml` file with the following content:

```
1 spring:
2   datasource:
3     password: jeep
4     username: jeep
5     url: jdbc:mysql://localhost:3306/jeep
6
7 logging:
8   level:
9     root: warn
10    '[com.promineotech]': debug
```

The bottom panel shows the console output. It starts with a debug message from the Spring Boot devtools, followed by the Spring Boot logo and version (v2.7.6). The output then shows several log entries indicating the application has restarted successfully:

```
2023-01-04 21:46:16.232 INFO 9980 --- [ restartedMain] com.promineotech.jeep.JeepSales : Starting JeepSales using Java 17.0.5 on
2023-01-04 21:46:16.233 DEBUG 9980 --- [ restartedMain] com.promineotech.jeep.JeepSales : Running with Spring Boot v2.7.6, Spring
2023-01-04 21:46:16.234 INFO 9980 --- [ restartedMain] com.promineotech.jeep.JeepSales : No active profile set, falling back to
2023-01-04 21:46:20.118 INFO 9980 --- [ restartedMain] com.promineotech.jeep.JeepSales : Started JeepSales in 4.45 seconds (JVM
```

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

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- 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:

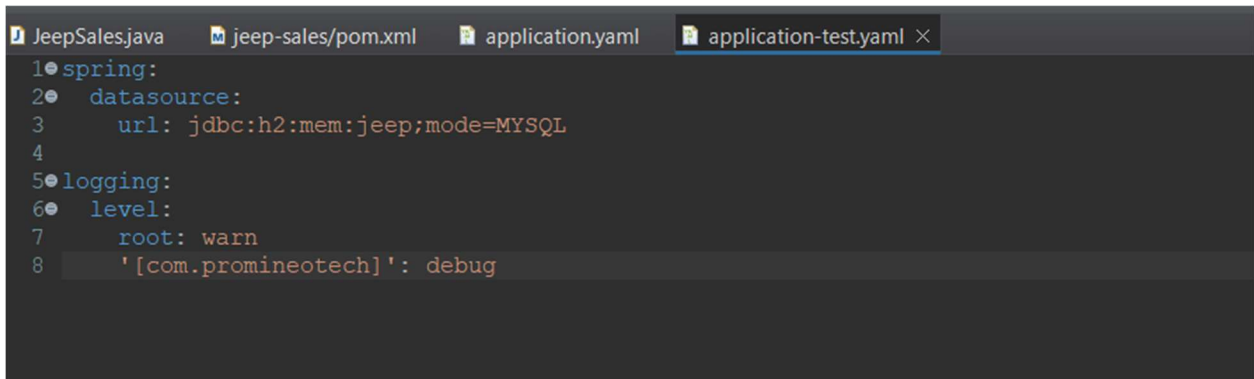
spring:

datasource:

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. 

A screenshot of an IDE window showing the file application-test.yaml. The file contains the following YAML configuration:

```
1 spring:
2   datasource:
3     url: jdbc:h2:mem:jeep;mode=MYSQL
4
5 logging:
6   level:
7     root: warn
8     '[com.promineotech]': debug
```