

Web API Design with Spring Boot Week 2 Coding Assignment

Points possible: 70

Category	Criteria	% of Grade
Functionality	Does the code work?	25
Organization	Is the code clean and organized? Proper use of white space, syntax, and consistency are utilized. Names and comments are concise and clear.	25
Creativity	Student solved the problems presented in the assignment using creativity and out of the box thinking.	25
Completeness	All requirements of the assignment are complete.	25


Instructions: In Eclipse, or an IDE of your choice, write the code that accomplishes the objectives listed below. Ensure that the code compiles and runs as directed. Take screenshots of the code and of the running program (make sure to get screenshots of all required functionality) and paste them in this document where instructed below. Create a new repository on GitHub for this week's assignments and push this document, with your Java project code, to the repository. Add the URL for this week's repository to this document where instructed and submit this document to your instructor when complete.

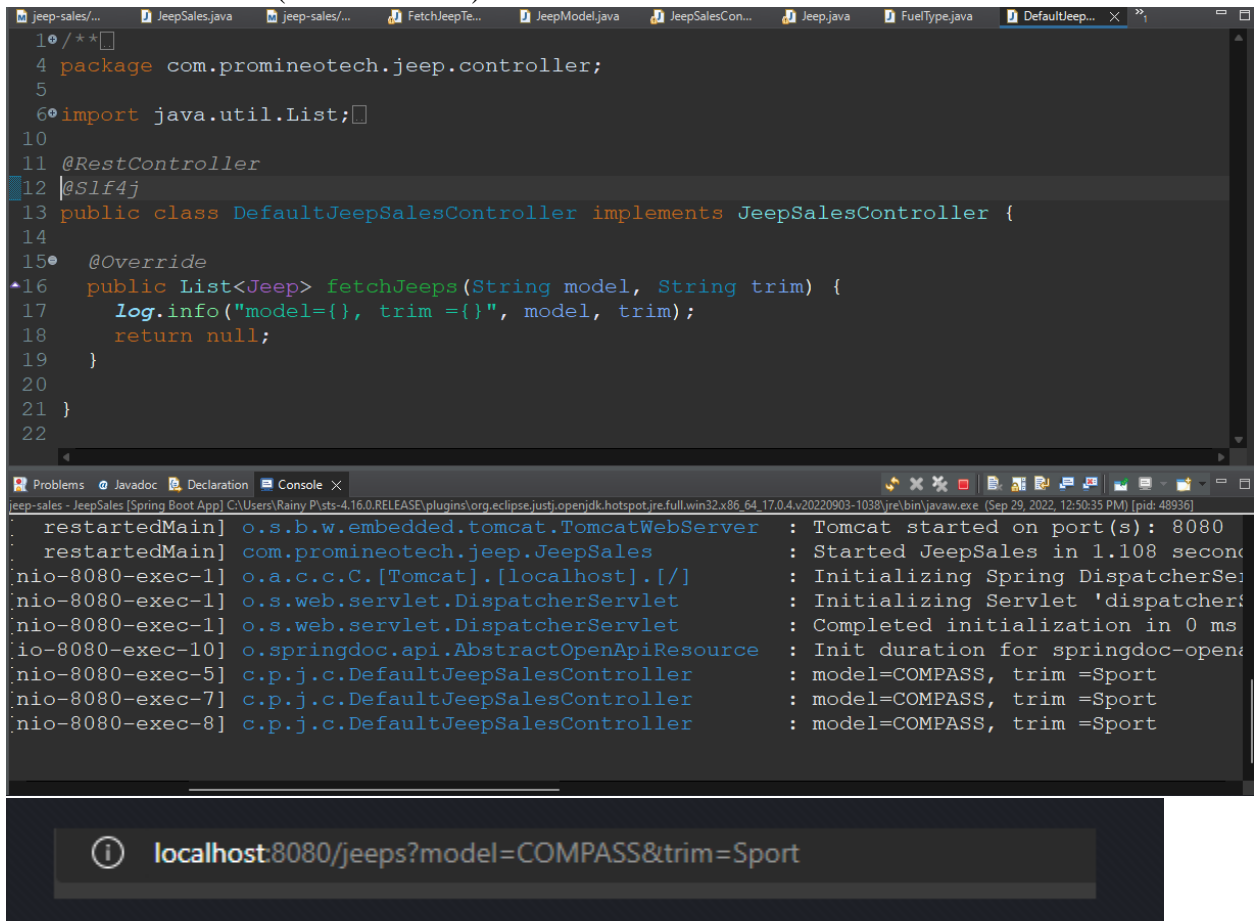
Here's a friendly tip: as you watch the videos, code along with the videos. This will help you with the homework. When a screenshot is required, look for the icon:  You will keep adding to this project throughout this part of the course. When it comes time for the final project, use this project as a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



The screenshot shows an IDE with a Java file named `DefaultJeepSalesController.java`. The code is as follows:

```
1 // **
4 package com.promineotech.jeep.controller;
5
6 import java.util.List;
10
11 @RestController
12 @Slf4j
13 public class DefaultJeepSalesController implements JeepSalesController {
14
15     @Override
16     public List<Jeep> fetchJeeps(String model, String trim) {
17         log.info("model={}, trim={}", model, trim);
18         return null;
19     }
20
21 }
22
```

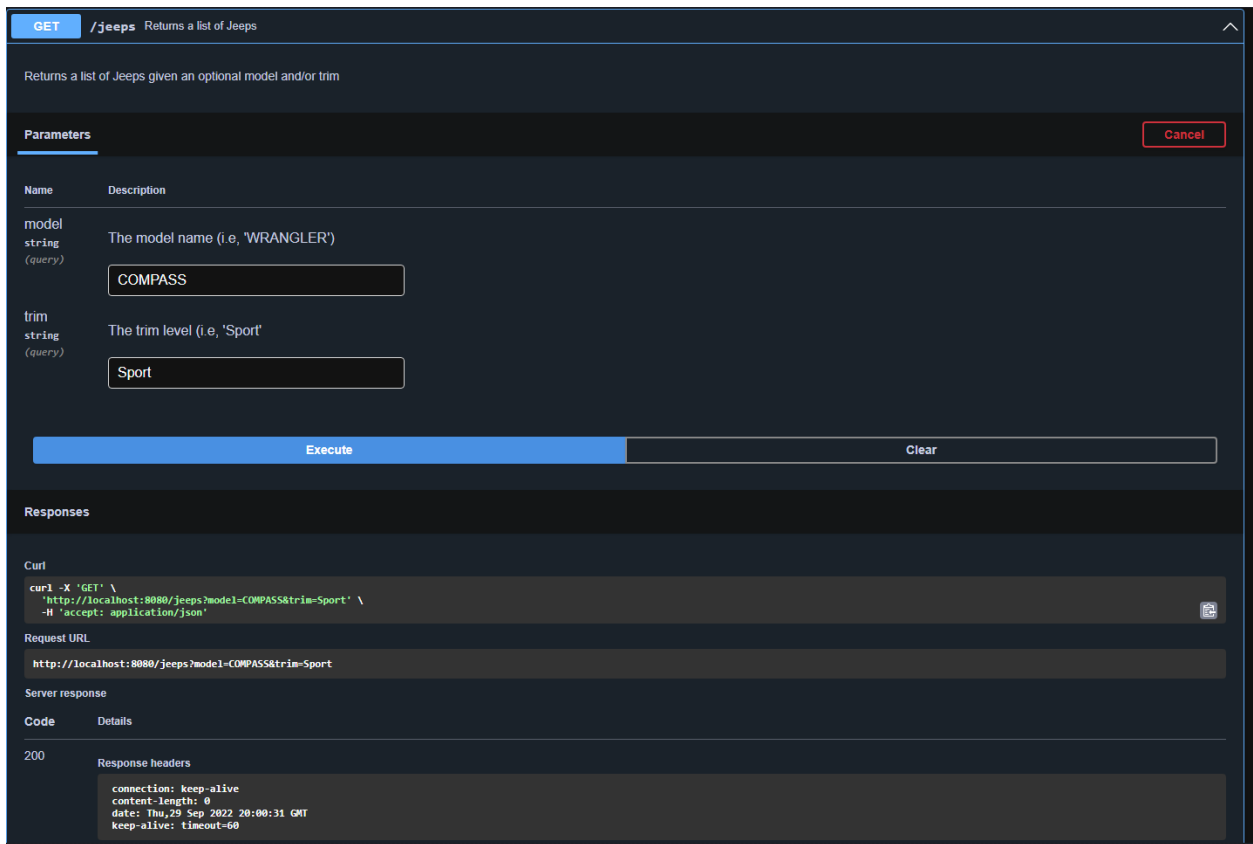
The console output shows the following logs:

```
restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8080
restartedMain] com.promineotech.jeep.JeepSales : Started JeepSales in 1.108 seconds
nio-8080-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring DispatcherServlet
nio-8080-exec-1] o.s.web.servlet.DispatcherServlet : Initializing Servlet 'dispatcherServlet'
nio-8080-exec-1] o.s.web.servlet.DispatcherServlet : Completed initialization in 0 ms
nio-8080-exec-10] o.springdoc.api.AbstractOpenApiResource : Init duration for springdoc-openapi
nio-8080-exec-5] c.p.j.c.DefaultJeepSalesController : model=COMPASS, trim =Sport
nio-8080-exec-7] c.p.j.c.DefaultJeepSalesController : model=COMPASS, trim =Sport
nio-8080-exec-8] c.p.j.c.DefaultJeepSalesController : model=COMPASS, trim =Sport
```

Below the console, a browser address bar is shown with the URL: `localhost:8080/jeeps?model=COMPASS&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. 



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')
trim string (query)	The trim level (i.e. 'Sport')

Execute Clear

Responses

Curl

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

Request URL

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


Server response

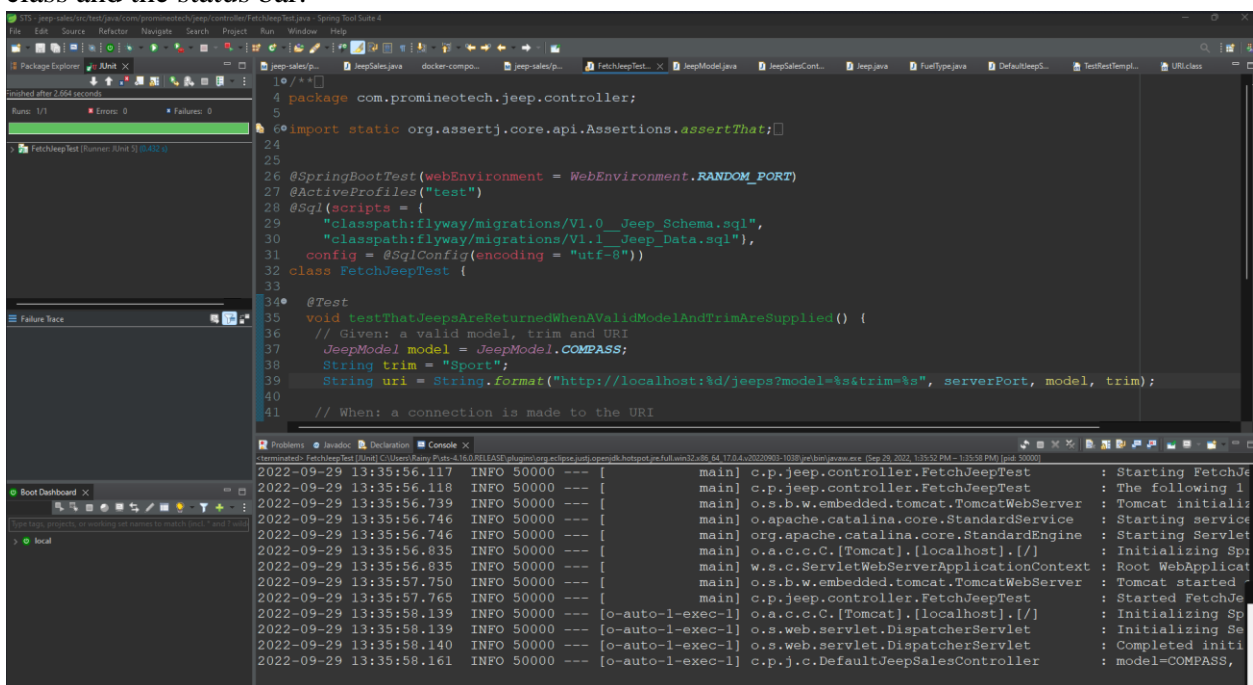
Code Details

200

Response headers

```
connection: keep-alive
content-length: 0
date: Thu, 29 Sep 2022 20:00:31 GMT
keep-alive: timeout=60
```

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



FetchJeepTest (Runner: JUnit 5) (0.032 s)

```
1 package com.promineotech.jeep.controller;
2
3 import static org.assertj.core.api.Assertions.assertThat;
4
5
6 @SpringBootTest(webEnvironment = WebEnvironment.RANDOM_PORT)
7 @ActiveProfiles("test")
8 @Sql(scripts = {
9     "classpath:flyway/migrations/V1.0__Jeep_Schema.sql",
10    "classpath:flyway/migrations/V1.1__Jeep_Data.sql",
11    config = @SqlConfig(encoding = "utf-8")
12 })
13 class FetchJeepTest {
14
15     @Test
16     void testThatJeepsAreReturnedWhenAValidModelAndTrimAreSupplied() {
17         // Given: a valid model, trim and URI
18         JeepModel model = JeepModel.COMPASS;
19         String trim = "Sport";
20         String uri = String.format("http://localhost:%d/jeeps?model=%s&trim=%s", serverPort, model, trim);
21
22         // When: a connection is made to the URI
```

Problems | Javadoc | Declaration | Console

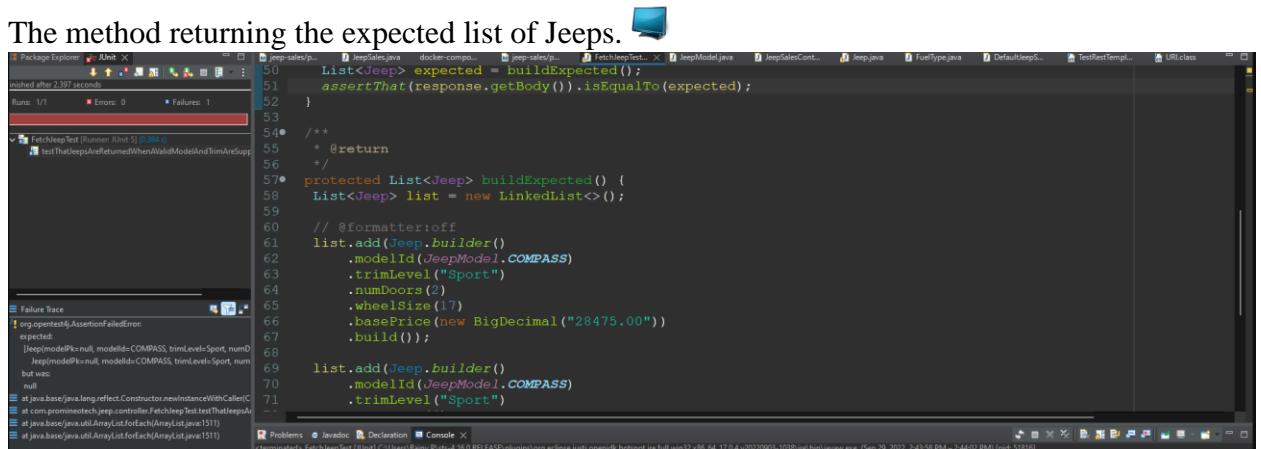
```
2022-09-29 13:35:56.117 INFO 50000 --- [main] c.p.jeep.controller.FetchJeepTest : Starting FetchJe
2022-09-29 13:35:56.118 INFO 50000 --- [main] c.p.jeep.controller.FetchJeepTest : The following l
2022-09-29 13:35:56.739 INFO 50000 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat initializ
2022-09-29 13:35:56.746 INFO 50000 --- [main] o.apache.catalina.core.StandardService : Starting service
2022-09-29 13:35:56.746 INFO 50000 --- [main] org.apache.catalina.core.StandardEngine : Starting Servlet
2022-09-29 13:35:56.835 INFO 50000 --- [main] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spi
2022-09-29 13:35:56.835 INFO 50000 --- [main] w.s.c.ServletWebServerApplicationContext : Root WebApplicat
2022-09-29 13:35:57.765 INFO 50000 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started
2022-09-29 13:35:57.765 INFO 50000 --- [main] c.p.jeep.controller.FetchJeepTest : Started FetchJe
2022-09-29 13:35:58.139 INFO 50000 --- [o-auto-1-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Sp
2022-09-29 13:35:58.139 INFO 50000 --- [o-auto-1-exec-1] o.s.web.servlet.DispatcherServlet : Initializing Se
2022-09-29 13:35:58.140 INFO 50000 --- [o-auto-1-exec-1] o.s.web.servlet.DispatcherServlet : Completed initi
2022-09-29 13:35:58.161 INFO 50000 --- [o-auto-1-exec-1] c.p.j.c.DefaultJeepSalesController : model=COMPASS,
```

- 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

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.

- 6) 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.



```

50 List<Jeep> expected = buildExpected();
51 assertThat(response.getBody(), isEqualTo(expected));
52 }
53
54 /**
55  * @return
56  */
57 protected List<Jeep> buildExpected() {
58     List<Jeep> list = new LinkedList<>();
59
60     // @formatter:off
61     list.add(Jeep.builder()
62         .modelId(JeepModel.COMPASS)
63         .trimLevel("Sport")
64         .numDoors(2)
65         .wheelSize(17)
66         .basePrice(new BigDecimal("28475.00"))
67         .build());
68
69     list.add(Jeep.builder()
70         .modelId(JeepModel.COMPASS)
71         .trimLevel("Sport")
72         .build());
73 }

```

Failure Trace

```

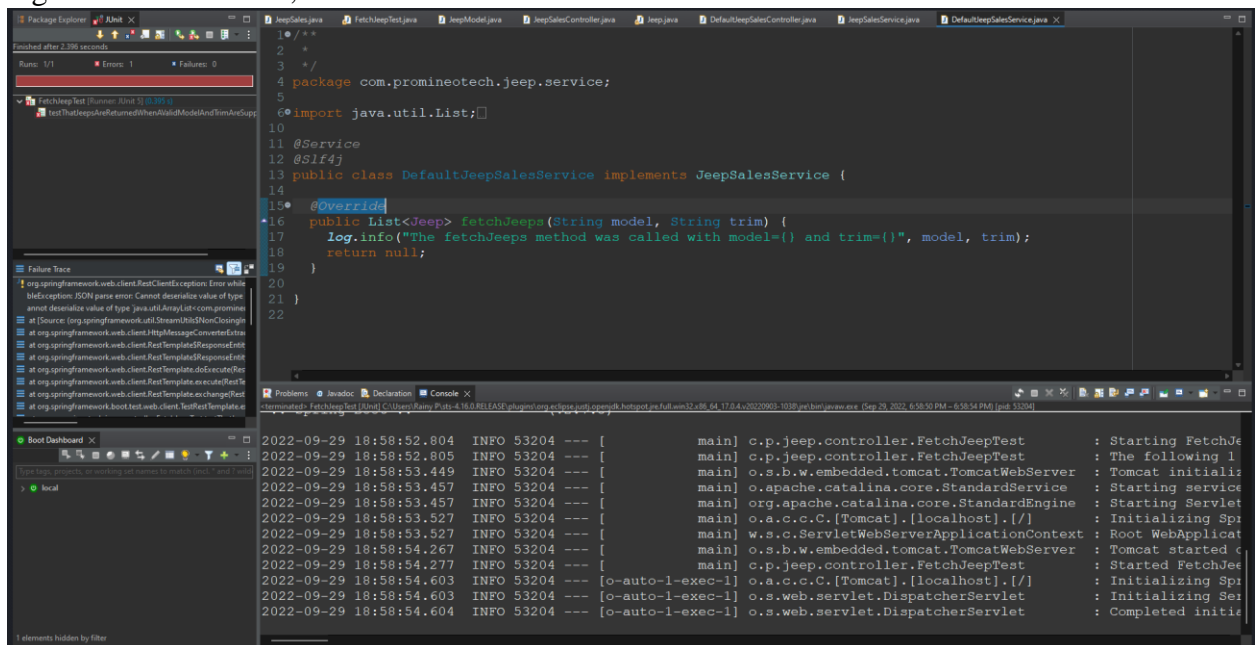
org.opentest4j.AssertionFailedError
expected:
  [Jeep(modelId=COMPASS, trimLevel=Sport, numDoors=2, wheelSize=17, basePrice=28475.00),
  Jeep(modelId=COMPASS, trimLevel=Sport, numDoors=4, wheelSize=17, basePrice=31975.00)]
but was:
  null
at java.base/java.lang.reflect.Constructor.newInstanceWithCaller(C:\Program Files\Java\jdk-11.0.10\src\main\java\lang\reflect\Constructor.java:155)
at com.promineotech.jeeptest.FetchJeepTest.testThatJeepReturnedWhenValidModelAndTrimLevelSupplied(FetchJeepTest.java:51)
at java.base/java.util.ArrayList.forEach(ArrayList.java:1511)

```

- 7) Add a service layer in your application as shown in the videos:
- Add a package named `com.promineotech.jeeptest.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`.

- 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.




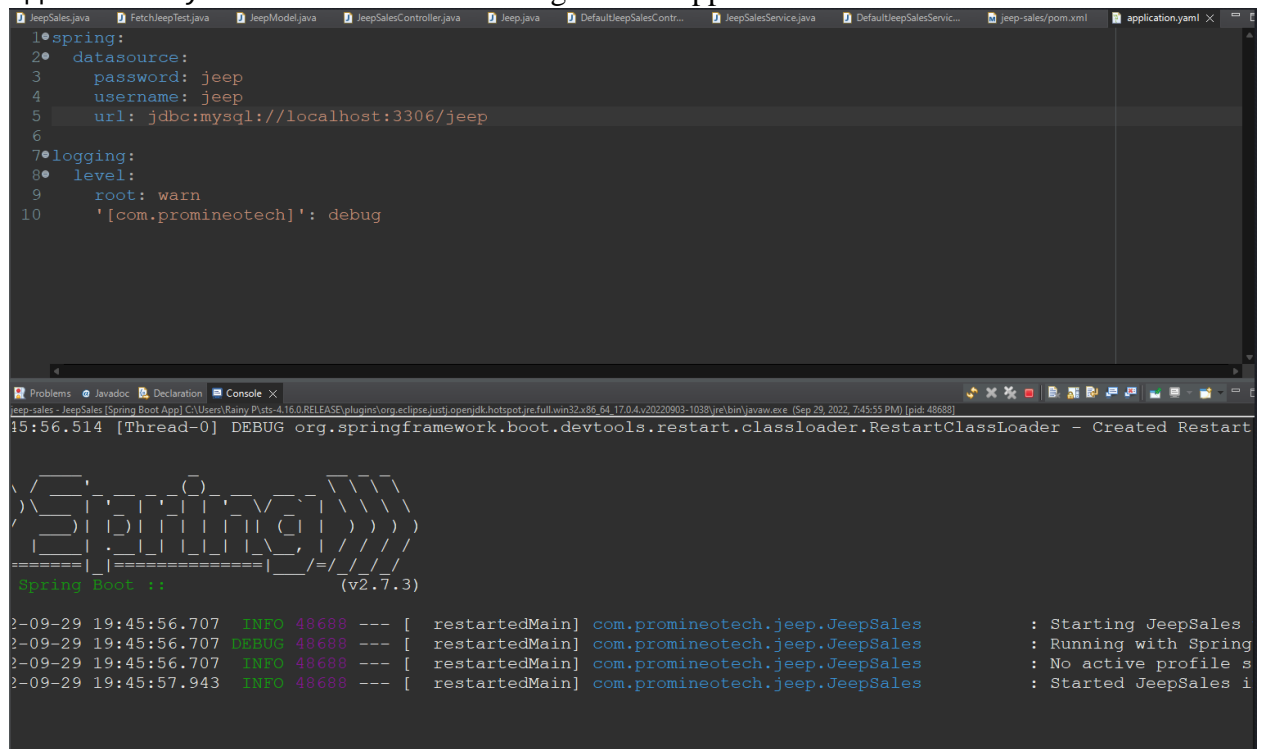
- 8) Add the database dependencies described in the video to the POM file (MySQL driver and Spring Boot Starter JDBC). To find them, navigate to <https://mvnrepository.com/>. Search for `mysql-connector-j` and `spring-boot-starter-jdbc`. In the POM file you don't need version numbers for either dependency because the version is included in the Spring Boot Starter Parent.
- 9) 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.

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
```

- 10) 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 windows. The top window displays the content of application.yaml, and the bottom window shows the console output.

```
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 console output shows the following messages:


```
15:56.514 [Thread-0] DEBUG org.springframework.boot.devtools.restart.classloader.RestartClassLoader - Created Restart
Spring Boot :: (v2.7.3)
2-09-29 19:45:56.707 INFO 48688 --- [ restartedMain] com.promineotech.jeep.JeepSales : Starting JeepSales
2-09-29 19:45:56.707 DEBUG 48688 --- [ restartedMain] com.promineotech.jeep.JeepSales : Running with Spring
2-09-29 19:45:56.707 INFO 48688 --- [ restartedMain] com.promineotech.jeep.JeepSales : No active profile s
2-09-29 19:45:57.943 INFO 48688 --- [ restartedMain] com.promineotech.jeep.JeepSales : Started JeepSales i
```

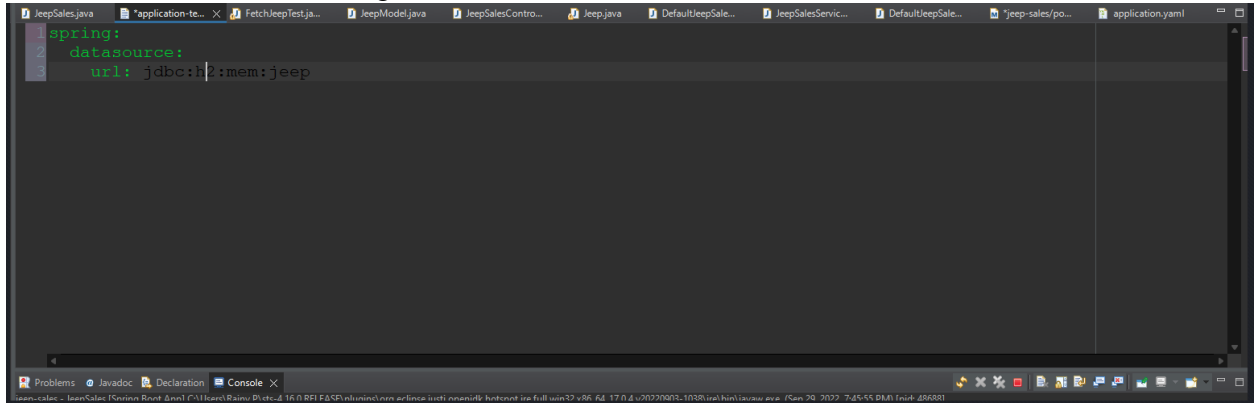
- 11) Add the H2 database as dependency. Search for the dependency in the Maven repository like you did above. Search for "h2" and pick the latest version. Again, you don't need the version number, but the scope should be set to "test".

- 12) 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
```

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. 



Screenshots of Code:

Screenshots of Running Application:

URL to GitHub Repository: [RPador \(Ranon Pador\) \(github.com\)](https://github.com/RPador)