

# 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.

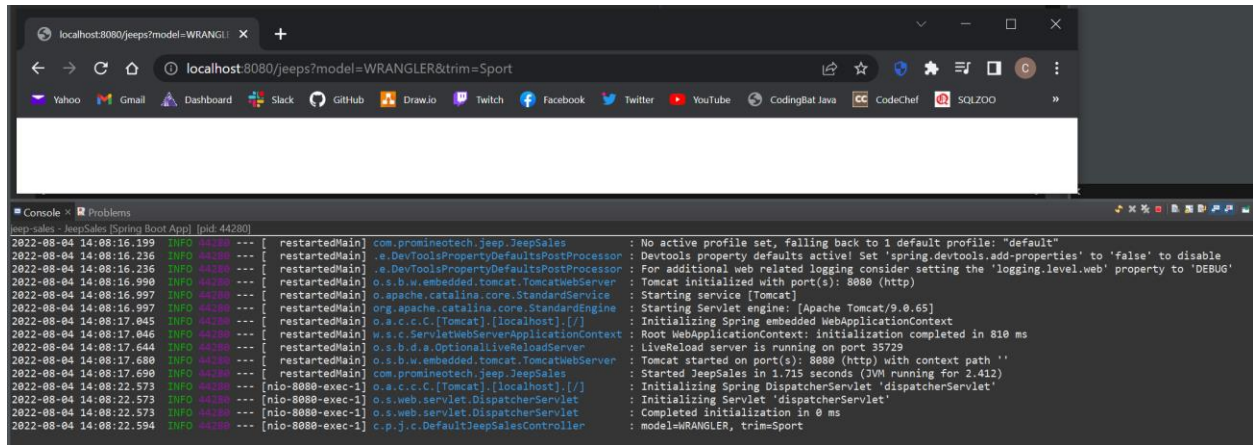
**Here's a friendly tip:** as you watch the videos, code along with the videos. This will help you with the homework. When a screenshot is required, look for the icon:  You will keep adding to this project throughout this part of the course. When it comes time for the final project, use this project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

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

## Coding Steps:

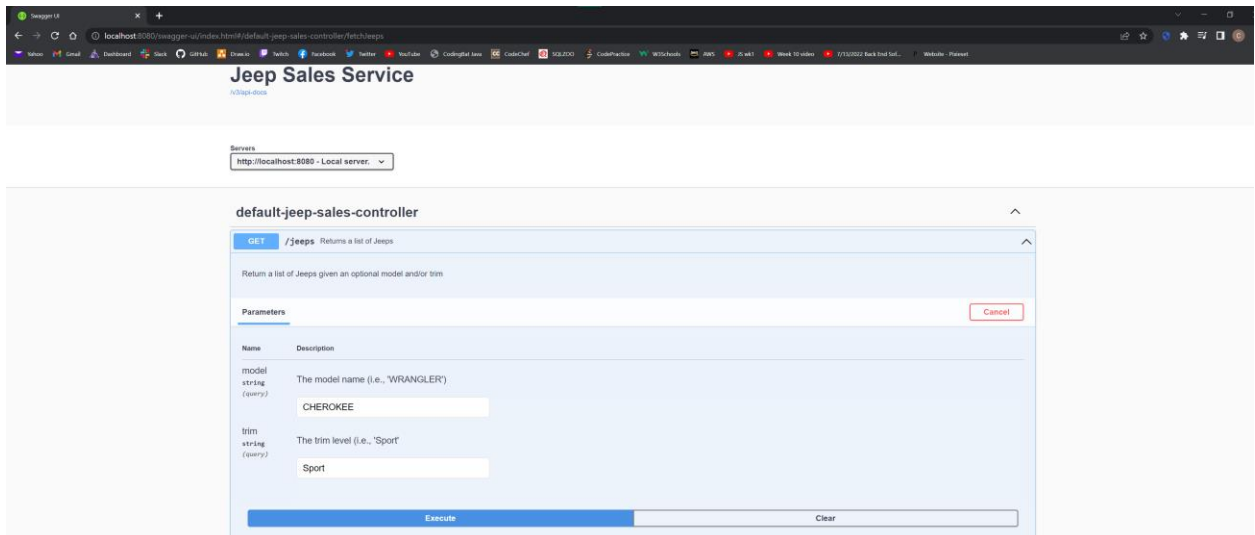
- 1) In the project you started last week, use Lombok to add an info-level logging statement in the controller implementation method that logs the parameters that were input to the method. Remember to add the `@Slf4j` annotation to the class.
- 2) Start the application (not an integration test). Use 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).



```
2022-08-04 14:08:16.199 INFO 44280 --- [ restartedMain] com.promineotech.jeepp.JeeppSales : No active profile set, falling back to 1 default profile: "default"
2022-08-04 14:08:16.236 INFO 44280 --- [ restartedMain] .e.DevToolsPropertyDefaultsPostProcessor : DevTools property defaults active! Set 'spring.devtools.add-properties' to 'false' to disable
2022-08-04 14:08:16.990 INFO 44280 --- [ restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat initialized with port(s): 8080 (http)
2022-08-04 14:08:16.997 INFO 44280 --- [ restartedMain] o.apache.catalina.core.StandardService : Starting service [Tomcat]
2022-08-04 14:08:16.997 INFO 44280 --- [ restartedMain] org.apache.catalina.core.StandardEngine : Starting Servlet engine: [Apache Tomcat/9.0.65]
2022-08-04 14:08:17.045 INFO 44280 --- [ restartedMain] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring embedded WebApplicationContext
2022-08-04 14:08:17.046 INFO 44280 --- [ restartedMain] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext: initialization completed in 810 ms
2022-08-04 14:08:17.644 INFO 44280 --- [ restartedMain] o.s.b.d.a.OptionalLiveReloadServer : LiveReload server is running on port 35729
2022-08-04 14:08:17.690 INFO 44280 --- [ restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8080 (http) with context path ''
2022-08-04 14:08:17.690 INFO 44280 --- [ restartedMain] com.promineotech.jeepp.JeeppSales : Started JeeppSales in 1.715 seconds (JVM running for 2.412)
2022-08-04 14:08:22.573 INFO 44280 --- [nio-8080-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring DispatcherServlet 'dispatcherServlet'
2022-08-04 14:08:22.573 INFO 44280 --- [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet : Initializing Servlet 'dispatcherServlet'
2022-08-04 14:08:22.594 INFO 44280 --- [nio-8080-exec-1] c.p.j.c.DefaultJeeppSalesController : Completed initialization in 0 ms
2022-08-04 14:08:22.594 INFO 44280 --- [nio-8080-exec-1] c.p.j.c.DefaultJeeppSalesController : 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.



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	<p>Response headers</p> <pre>connection: keep-alive content-length: 0 date: Thu, 04 Aug 2022 20:11:50 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 occurred.	No links

Media type:

Controls Accept header.

Example Value | Schema

```
{
  "modelPK": 0,
  "modelId": "WRANGLER",
  "trimLevel": "string",
  "numbers": 0,
  "wheelSize": 0,
  "basePrice": 0
}
```

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

```

1 package com.promineotech.jeepp.controller;
2
3 import static org.assertj.core.api.Assertions.assertThat;
4
5
6
7
8
9
10
11
12 @SpringBootTest(webEnvironment = WebEnvironment.RANDOM_PORT)
13 @ActiveProfiles("test")
14 @Sql(scripts = {
15     "classpath:flyway/migrations/V1.0__Jeep_Schema.sql",
16     "classpath:flyway/migrations/V1.1__Jeep_Data.sql"},
17     config = @SqlConfig(encoding = "utf-8"))
18
19 class FetchJeepTest {
20
21     @Autowired
22     private TestRestTemplate restTemplate;
23
24     @LocalServerPort
25     private int serverPort;
26
27     @Test
28     void testThatJeepsAreReturnedWhenAValidModelAndTrimAreSupplied() {
29
30         JeepModel model = JeepModel.WRANGLER;
31         String trim = "Sport";
32         String uri =
33             String.format("http://localhost:%d/jeeps?model=%s&trim=%s",
34                 serverPort, model, trim);
35
36         ResponseEntity<List<Jeep>> response = restTemplate.exchange(
37             uri, HttpMethod.GET, null, new ParameterizedTypeReference<>() {});
38
39         assertThat(response.getStatusCode()).isEqualTo(HttpStatus.OK);
40     }
41 }

```

JUnit

Finished after 3.466 seconds

Runs: 1/1   Errors: 0   Failures: 0


> FetchJeepTest [Runner: JUnit 5] (0.569 s)

Failure Trace

- 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

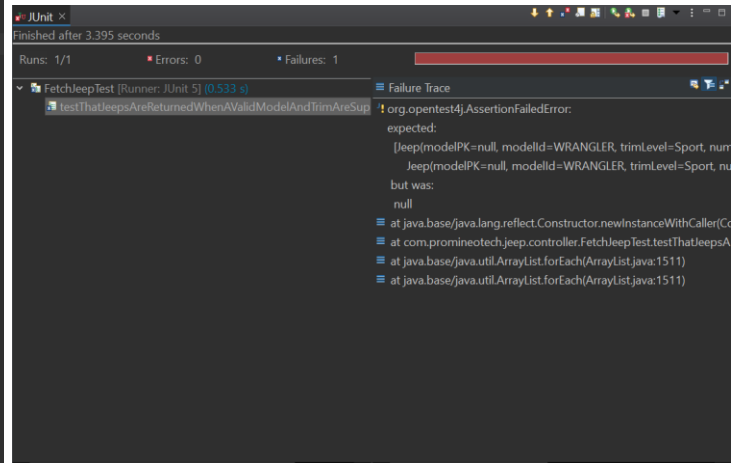
The method should be named `buildExpected()`, and it should return a `List of Jeep`. The video put this method into a support superclass but you can include it in the main test class if you want.

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

```

1 package com.promineotech.jeeptest.controller;
2
3 import static org.assertj.core.api.Assertions.assertThat;
4
5 @SpringBootTest(webEnvironment = WebEnvironment.RANDOM_PORT)
6 @ActiveProfiles("test")
7 @Sql(scripts = {
8     "classpath:flyway/migrations/V1.0__Jeep_Schema.sql",
9     "classpath:flyway/migrations/V1.1__Jeep_Data.sql"},
10     config = @SqlConfig(encoding = "utf-8"))
11
12 class FetchJeepTest {
13
14     @Autowired
15     private TestRestTemplate restTemplate;
16
17     @LocalServerPort
18     private int serverPort;
19
20     @Test
21     void testThatJeepsAreReturnedWhenAValidModelAndTrimAreSupplied() {
22
23         // Given a valid model trim and URI
24         JeepModel model = JeepModel.WRANGLER;
25         String trim = "Sport";
26         String uri =
27             String.format("http://localhost:%d/jeeps?model=%s&trim=%s",
28                 serverPort, model, trim);
29
30         // When a Connection is made to the URI
31         ResponseEntity<List<Jeep>> response = restTemplate.exchange(
32             uri, HttpMethod.GET, null, new ParameterizedTypeReference<>() {});
33
34         // Then a success (OK - 200) status code is returned
35         assertThat(response.getStatusCode()).isEqualTo(HttpStatus.OK);
36
37         // And: the actual list returned is the same as the expected list
38         List<Jeep> expected = buildExpected();
39         assertThat(response.getBody()).isEqualTo(expected);
40     }
41
42     protected List<Jeep> buildExpected() {
43         List<Jeep> list = new LinkedList<>();
44         //@formatter:off
45         list.add(Jeep.builder()
46             .modelId(JeepModel.WRANGLER)
47             .trimLevel("Sport")
48             .numDoors(2)
49             .wheelSize(17)
50             .basePrice(new BigDecimal("28475.00"))
51             .build());
52
53         list.add(Jeep.builder()
54             .modelId(JeepModel.WRANGLER)
55             .trimLevel("Sport")
56             .numDoors(2)
57             .wheelSize(17)
58             .basePrice(new BigDecimal("31975.00"))
59             .build());
60         //@formatter:on
61
62         return list;
63     }
64 }

```



```


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:: Spring Boot ::
(v2.7.2)

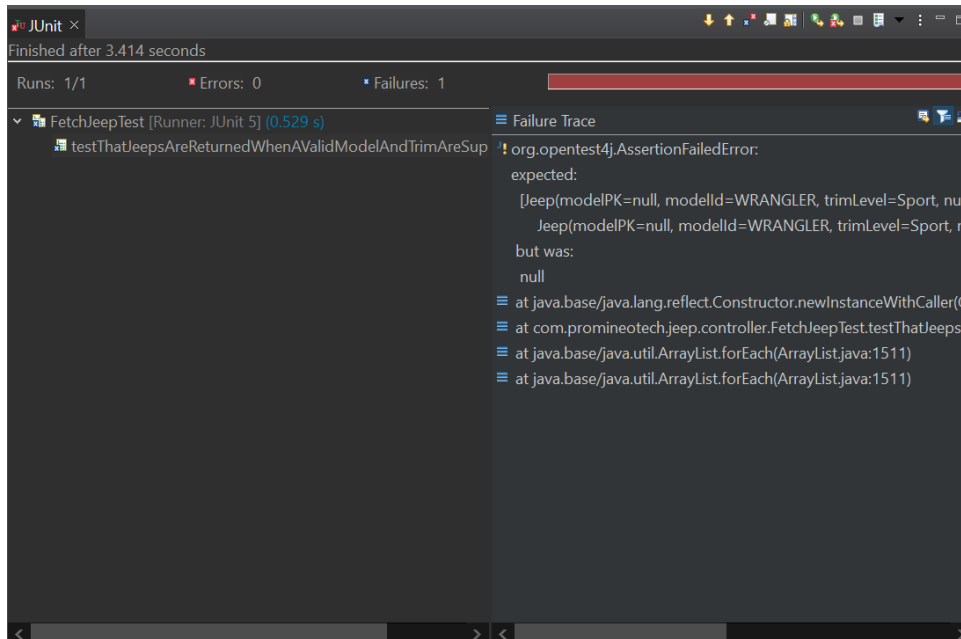
2022-08-04 14:58:37.211 INFO 32068 --- [main] c.p.jeeptest.controller.FetchJeepTest : Starting FetchJeepTest using Java 17.0.3 on DESKTOP-MQ050E1 with PID 32068 (started by thepo in C:\Users\
2022-08-04 14:58:37.212 DEBUG 32068 --- [main] c.p.jeeptest.controller.FetchJeepTest : Running with Spring Boot v2.7.2, Spring v5.3.22
2022-08-04 14:58:37.212 INFO 32068 --- [main] c.p.jeeptest.controller.FetchJeepTest : The following 1 profile is active: "test"
2022-08-04 14:58:39.194 INFO 32068 --- [main] c.p.jeeptest.controller.FetchJeepTest : Started FetchJeepTest in 2.274 seconds (JVM running for 3.128)
2022-08-04 14:58:39.640 DEBUG 32068 --- [o-auto-1-exec-1] c.p.j.c.DefaultJeepSalesController : model=WRANGLER, trim=Sport
[Jeep(modelPK=null, modelId=WRANGLER, trimLevel=Sport, numDoors=2, wheelSize=17, basePrice=28475.00), Jeep(modelPK=null, modelId=WRANGLER, trimLevel=Sport, numDoors=2, wheelSize=17, basePrice=31975.00)]

```

- 7) Add a service layer in your application as shown in the videos:
- Add a package named `com.promineotech.jeepp.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`.
  - Inject the service interface into `DefaultJeepSalesController` using the `@Autowired` annotation. The instance variable should be private, and the variable should be named `jeepSalesService`.
  - 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);
```
  - 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.
  - Run the test again. Produce a screenshot showing the service class implementation, the log line in the console, and the red status bar. 

```
1 package com.promineotech.jeepp.service;
2
3 import java.util.List;
4 import org.springframework.stereotype.Service;
5 import com.promineotech.jeepp.entity.Jeep;
6 import lombok.extern.slf4j.Slf4j;
7
8 @Service
9 @Slf4j
10 public class DefaultJeepSalesService implements JeepSalesService {
11
12     public List<Jeep> fetchJeeps(String model, String trim) {
13         Log.info("The fetchJeeps method was called with model={} and trim={}",
14             model, trim);
15
16         return null;
17     }
18
19 }
```



```

OS: [Linux]
:: Spring Boot :: (v2.7.2)

022-08-04 15:25:26.600 INFO 34888 --- [main] c.p.jeepp.controller.FetchJeepTest : Starting FetchJeepTest using Java 17.0.3 on DESKTOP-MQ050E1 with PID 34888
022-08-04 15:25:26.601 DEBUG 34888 --- [main] c.p.jeepp.controller.FetchJeepTest : Running with Spring Boot v2.7.2, Spring v5.3.22
022-08-04 15:25:26.602 INFO 34888 --- [main] c.p.jeepp.controller.FetchJeepTest : The following 1 profile is active: "test"
022-08-04 15:25:28.728 INFO 34888 --- [main] c.p.jeepp.controller.FetchJeepTest : Started FetchJeepTest in 2.421 seconds (JVM running for 3.291)
022-08-04 15:25:29.201 DEBUG 34888 --- [o-auto-1-exec-1] c.p.j.c.DefaultJeepSalesController : model=WRANGLER, trim=Sport
022-08-04 15:25:29.202 INFO 34888 --- [o-auto-1-exec-1] c.p.j.service.DefaultJeepSalesService : The fetchJeeps method was called with model=WRANGLER and trim=Sport


```

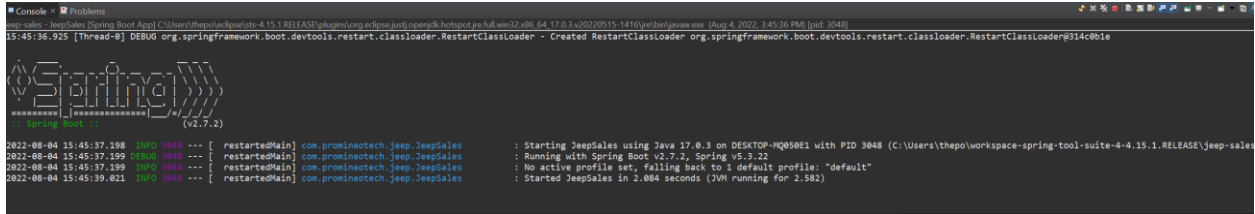
- 8) Add the database dependencies described in the video to the POM file (MySQL driver and Spring Boot Starter JDBC). To find them, nagivate to <https://mvnrepository.com/>. Search for mysql-connector-j and spring-boot-starter-jdbc. In the POM file you don't need version numbers for either dependency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



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


- 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. 

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

**URL to GitHub Repository:**

<https://github.com/coltonrood/Week14/>