


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.

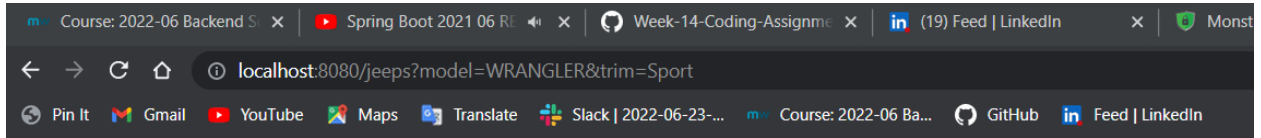
Here's a friendly tip: as you watch the videos, code along with the videos. This will help you with the homework. When a screenshot is required, look for the icon:  You will keep adding to this project throughout this part of the course. When it comes time for the final project, use this project as a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



```
V1.1_jeep_data.sql  FetchJeepTest.java  JeepSales.java  DefaultJeepSalesController.java  JeepSalesController.java
1 package com.promineotech.jeep;
2
3 import org.springframework.boot.SpringApplication;
4
5
6 @SpringBootApplication
7 public class JeepSales {
8
9     public static void main(String[] args) {
10         SpringApplication.run(JeepSales.class, args);
11     }
12 }
13
14 }
15
```

```
Problems  Javadoc  Declaration  Console
jeep-sales - JeepSales [Spring Boot App] C:\Users\merce\Downloads\sts-4.16.0.RELEASE\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64.jre\bin\javaw.exe (Oct 15, 2022 10:04:24 PM) [pid: 19368]
22-10-15 22:04:46.890 INFO 19368 --- [nio-8080-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring DispatcherServlet 'dispatcherServ
22-10-15 22:04:46.891 INFO 19368 --- [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet : Initializing Servlet 'dispatcherServlet'
22-10-15 22:04:46.894 INFO 19368 --- [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet : Completed initialization in 3 ms
22-10-15 22:04:46.959 INFO 19368 --- [nio-8080-exec-1] c.p.j.c.DefaultJeepSalesController : model=WRANGLER, trimSport
22-10-15 22:05:00.613 INFO 19368 --- [nio-8080-exec-3] c.p.j.c.DefaultJeepSalesController : model=WRANGLER, trimSport
```

- 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
```

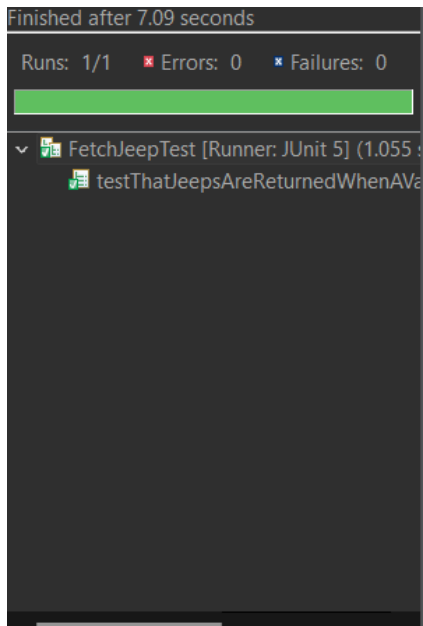
Server response

Code	Details
200	<p>Response headers</p> <pre>connection: keep-alive content-length: 0 date: Sun, 15 Oct 2022 03:10:33 GMT keep-alive: timeout=60</pre>

Responses

Code	Description	Links
200	A list of Jeeps is returned	No links

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




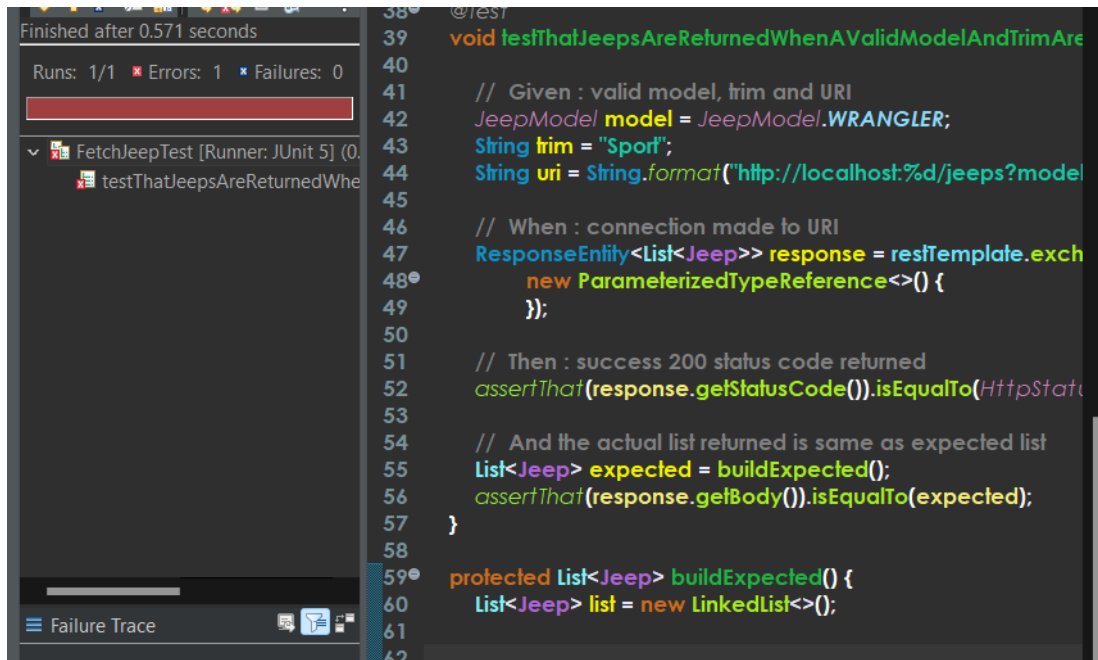
- 5) Add a method to the test to return a list of expected Jeep (model) objects based on the model and trim level you selected. You can get the expected list of Jeeps from the file `src/test/resources/flyway/migrations/V1.1__Jeep_Data.sql`. So, for example, using the model Wrangler and trim level "Sport",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

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. 




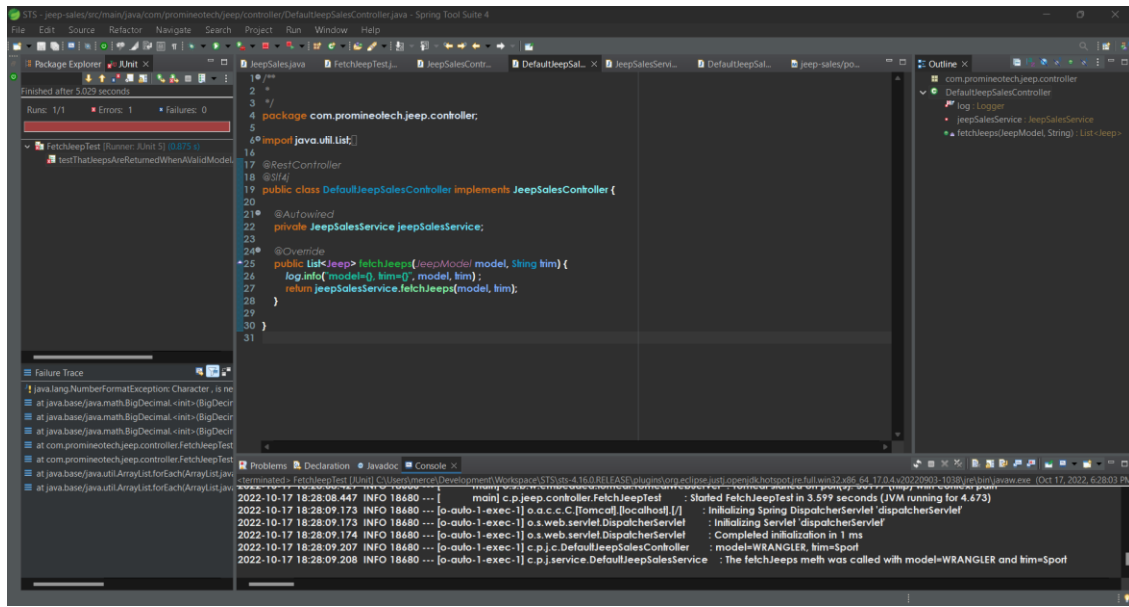
```

38 @Test
39 void testThatJeepsAreReturnedWhenAValidModelAndTrimAre
40
41 // Given : valid model, trim and URI
42 JeepModel model = JeepModel.WRANGLER;
43 String trim = "Sport";
44 String uri = String.format("http://localhost:%d/jeeps?model=%s&trim=%s", 8080, model, trim);
45
46 // When : connection made to URI
47 ResponseEntity<List<Jeep>> response = restTemplate.exchange(uri, HttpMethod.GET, null,
48     new ParameterizedTypeReference<>() {
49     });
50
51 // Then : success 200 status code returned
52 assertThat(response.getStatusCode(), equalTo(HttpStatus.OK));
53
54 // And the actual list returned is same as expected list
55 List<Jeep> expected = buildExpected();
56 assertThat(response.getBody(), equalTo(expected));
57 }
58
59 protected List<Jeep> buildExpected() {
60     List<Jeep> list = new LinkedList<>();
61
62

```

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

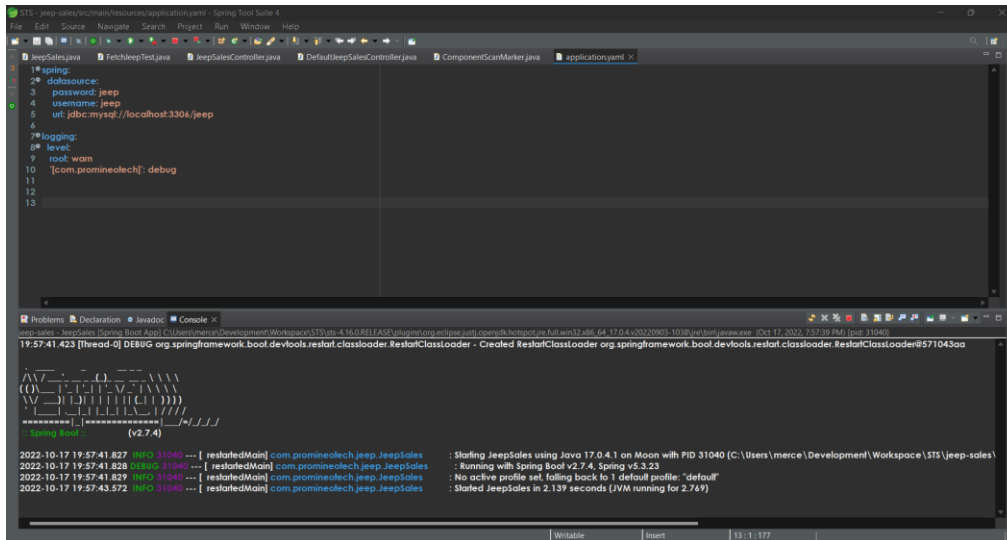


- 8) Add the database dependencies described in the video to the POM file (MySQL driver and Spring Boot Starter JDBC). To find them, navigate to <https://mvnrepository.com/>. Search for mysql-connector-j and spring-boot-starter-jdbc. In the POM file you don't need version numbers for either dependency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



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.yml in src/test/resources. Add the setting spring.datasource.url that points to the H2 database. It should look like this:

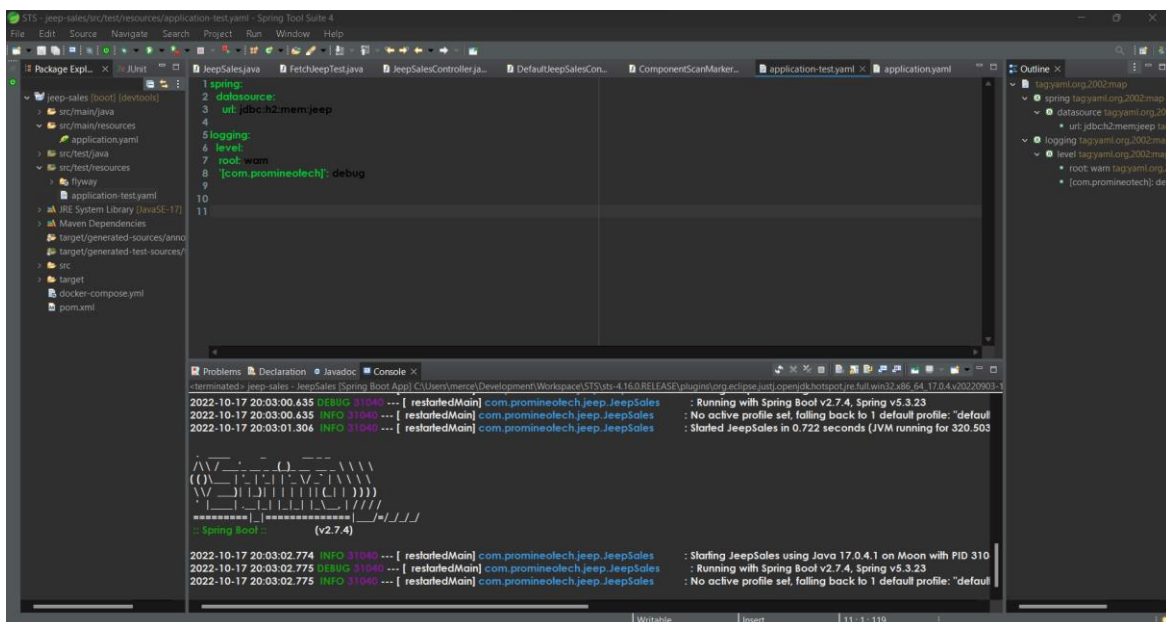
```

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.yml. 



Screenshots of Code:

```
1  /**
4  package com.promineotech;
5
6
7  public interface ComponentScanMarker {
8
9  }
10
```

```
1
2  package com.promineotech.jeep;
3
4  import org.springframework.boot.SpringApplication;
5
6  @SpringBootApplication(scanBasePackageClasses = { ComponentScanMarker.class })
7  public class JeepSales {
8
9      public static void main(String[] args) {
10         SpringApplication.run(JeepSales.class, args);
11     }
12 }
13
```

```
1  /**
4  package com.promineotech.jeep.controller;
5
6  import java.util.List;
7
8  @RestController
9  @Slf4j
10 public class DefaultJeepSalesController implements JeepSalesController {
11
12     @Autowired
13     private JeepSalesService jeepSalesService;
14
15     @Override
16     public List<Jeep> fetchJeeps(JeepModel model, String trim) {
17         log.debug("model={}, trim={}", model, trim);
18         return jeepSalesService.fetchJeeps(model, trim);
19     }
20 }
21
```

```

1
2 package com.promineotech.jeep.controller;
3
4 import java.util.List;
5
6
7
8
9
10
11
12
13
14
15
16 @RequestMapping("/jeeps")
17 @OpenAPIDefinition(info = @Info(title = "Jeep Sales Service"), servers = {
18     @Server(url = "http://localhost:8080", description = "Local server.") })
19 public interface JeepSalesController {
20
21     // @formatter: off
22     @Operation(
23
24         summary = "Returns a list of Jeeps",
25         description = "Returns a list of Jeeps given an optional model and/or trim.",
26         responses = {
27
28             @ApiResponse(
29                 responseCode = "200",
30                 description = "A list of Jeeps is returned.",
31                 content = @Content(
32                     mediaType = "application/json",
33                     schema = @Schema(implementation = Jeep.class))),
34
35             @ApiResponse(
36                 responseCode = "400",
37                 description = "The request parameters are invalid.",
38                 content = @Content(mediaType = "application/json")),
39
40             @ApiResponse(
41                 responseCode = "404",
42                 description = "No Jeeps were found with the input criteria",
43                 content = @Content(mediaType = "application/json")),
44
45             @ApiResponse(
46                 responseCode = "500",
47                 description = "An unplanned error occurred.",
48                 content = @Content(mediaType = "application/json"))
49         }
50     ),
51
52 }

```



```

60     parameters = {
61
62         @Parameter(
63             name = "model",
64             allowEmptyValue = false,
65             required = false,
66             description = "The model name(i.e., 'WRANGLER')"),
67
68         @Parameter(
69             name = "trim",
70             allowEmptyValue = false,
71             required = false,
72             description = "The trim level(i.e., 'Sport')")
73     }
74 )
75 // @formatter: on
76 @GetMapping
77 @ResponseStatus(code = HttpStatus.OK)
78 List<Jeep> fetchJeeps(@RequestParam JeepModel model,
79                     @RequestParam String trim);
80
81 }
82

```

```

1  /**
4  package com.promineotech.jeep.service;
5
6  import java.util.List;
14
15 @Service
16 @Slf4j
17 public class DefaultJeepSalesService implements JeepSalesService {
18
19
20 @Override
21 public List<Jeep> fetchJeeps(JeepModel model, String trim) {
22     log.info("The fetchJeeps meth was called with model={} and trim={}",
23             model, trim);
24
25     return null;
26 }
27
28 }
29

```

```

1  /**
4  package com.promineotech.jeepproject.service;
5
6  import java.util.List;
10
11  public interface JeepSalesService {
12
13
14      List<Jeep> fetchJeeps(JeepModel model, String trim);
15
16  }
17

```

```

1  package com.promineotech.jeepproject.controller;
2
3  import static org.assertj.core.api.Assertions.assertThat;
29
30  @EnableAutoConfiguration
31  @SpringBootTest(webEnvironment = WebEnvironment.RANDOM_PORT, classes = JeepSales.class)
32  @ActiveProfiles("test")
33  @Sql(scripts = {"classpath:flyway/migrations/V1.0__Jeep_Schema.sql",
34      "classpath:flyway/migrations/V1.1__Jeep_Data.sql"}, config = @SqlConfig(encoding = "utf-8"))
35  class FetchJeepTest {
36
37      @Autowired
38      private TestRestTemplate restTemplate;
39
40      @LocalServerPort
41      private int serverPort;
42
43      @Test
44      void testThatJeepsAreReturnedWhenAValidModelAndTrimAreSupplied() {
45
46          // Given : valid model, trim and URI
47          JeepModel model = JeepModel.WRANGLER;
48          String trim = "Sport";
49          String uri = String.format("http://localhost:%d/jeeps?model=%s&trim=%s", serverPort, model, trim);
50
51          // When : connection made to URI
52          ResponseEntity<List<Jeep>> response = restTemplate.exchange(uri, HttpMethod.GET, null,
53              new ParameterizedTypeReference<>() {
54              });
55
56          // Then : success 200 status code returned
57          assertThat(response.getStatusCode()).isEqualTo(HttpStatus.OK);
58
59          // And the actual list returned is same as expected list
60          List<Jeep> expected = buildExpected();
61          assertThat(response.getBody()).isEqualTo(expected);
62      }
63
64      protected List<Jeep> buildExpected() {
65          List<Jeep> list = new LinkedList<>();
66

```

```

67 // @formatter:off
68 list.add(Jeep.builder()
69     .modelId(JeepModel.WRANGLER)
70     .trimLevel("Sport")
71     .numDoors(2)
72     .wheelSize(17)
73     .basePrice(new BigDecimal("28,475.00"))
74     .build());
75
76 list.add(Jeep.builder()
77     .modelId(JeepModel.WRANGLER)
78     .trimLevel("Sport")
79     .numDoors(4)
80     .wheelSize(17)
81     .basePrice(new BigDecimal("31,975.00"))
82     .build());
83 // @formatter:on
84
85 return list;
86 }
87
88 }
89

```

```

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
11
12
13

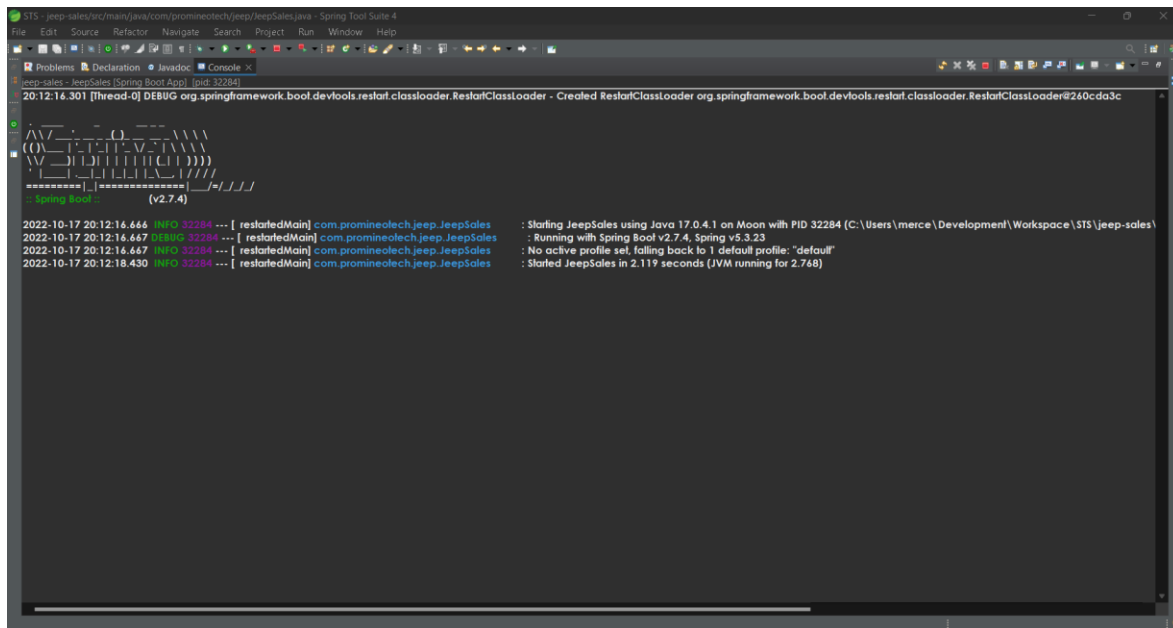
```

```

1 spring:
2   datasource:
3     url: jdbc:h2:mem:jeep
4
5 logging:
6   level:
7     root: warn
8    '[com.promineotech]': debug
9
10
11

```

Screenshots of Running Application:



URL to GitHub Repository:

<https://github.com/MThunder2/Spring-Boot.git>