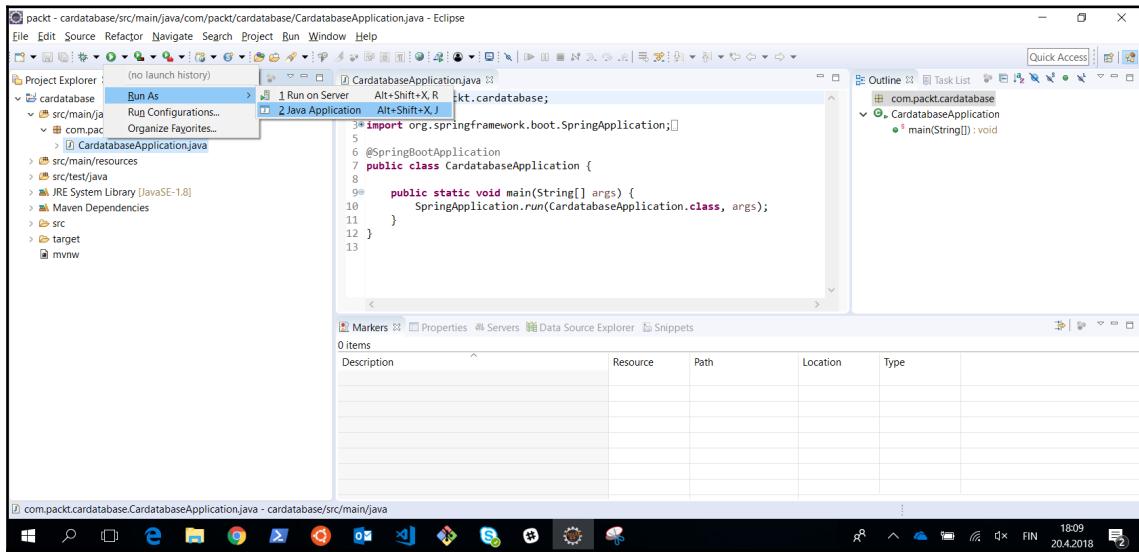


Chapter 1: Setting Up the Environment and Tools - Backend



← → ⌛ 🔒 https://start.spring.io

 Spring Initializr
Bootstrap your application

Project Maven Project Gradle Project

Language Java Kotlin Groovy

Spring Boot 2.2.0 M1 2.2.0 (SNAPSHOT) 2.1.4 (SNAPSHOT) **2.1.3** 1.5.19

Project Metadata

Group com.packt

Artifact cardatabase

More options

Dependencies See all

Search dependencies to add
Web, Security, JPA, Actuator, Devtools...

Generate Project - alt + ↵

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start.spring.io is powered by
[Spring Initializr](#) and [Pivotal Web Services](#)

List of dependencies for **Spring Boot 2.1.3.RELEASE**

Core

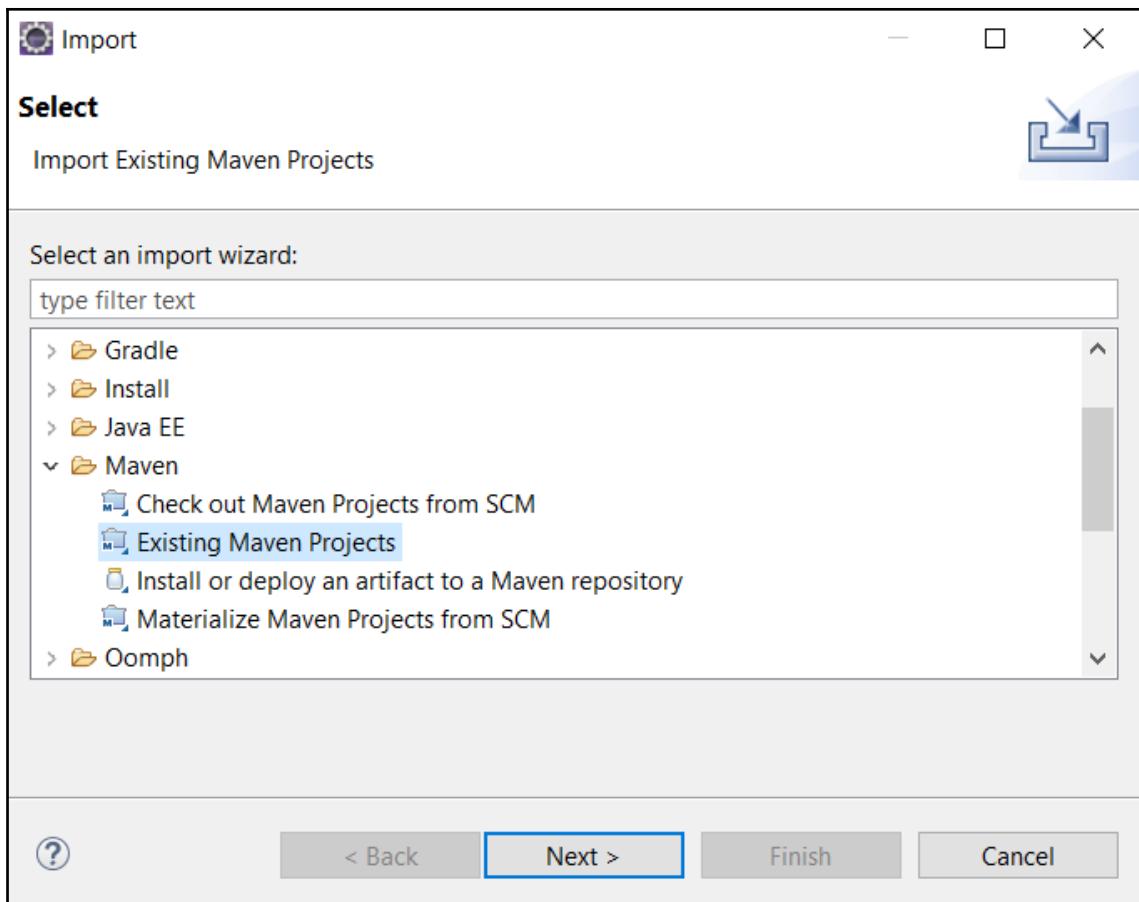
- DevTools:** Spring Boot Development Tools
- Lombok:** Java annotation library which helps to reduce boilerplate code and code faster
- Configuration Processor:** Generate metadata for your custom configuration keys
- Session:** API and implementations for managing a user's session information
- Cache:** Spring's Cache abstraction
- Validation:** JSR-303 validation infrastructure (already included with web)
- Retry:** Provide declarative retry support via spring-retry
- Aspects:** Create your own Aspects using Spring AOP and AspectJ

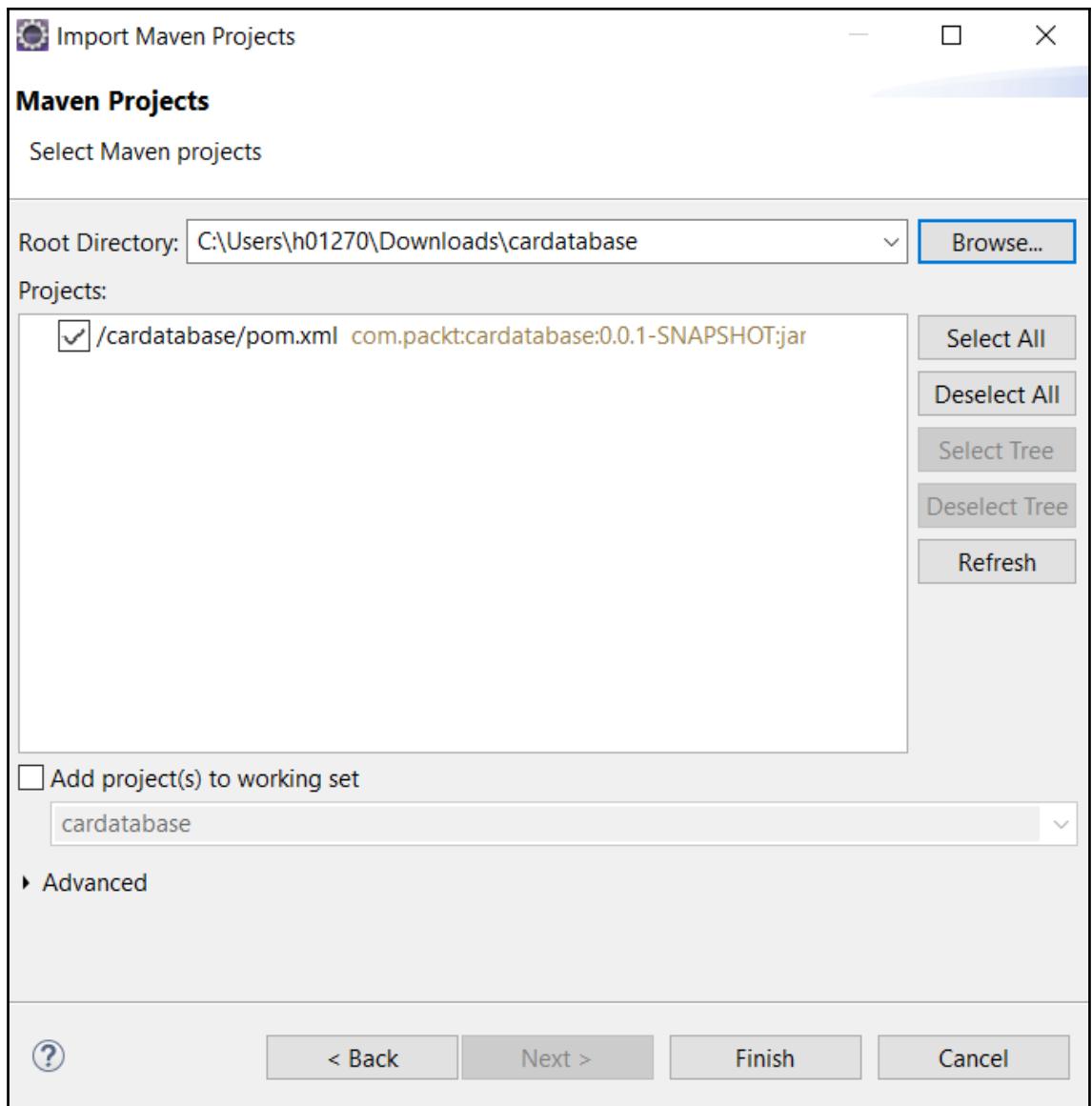
Web

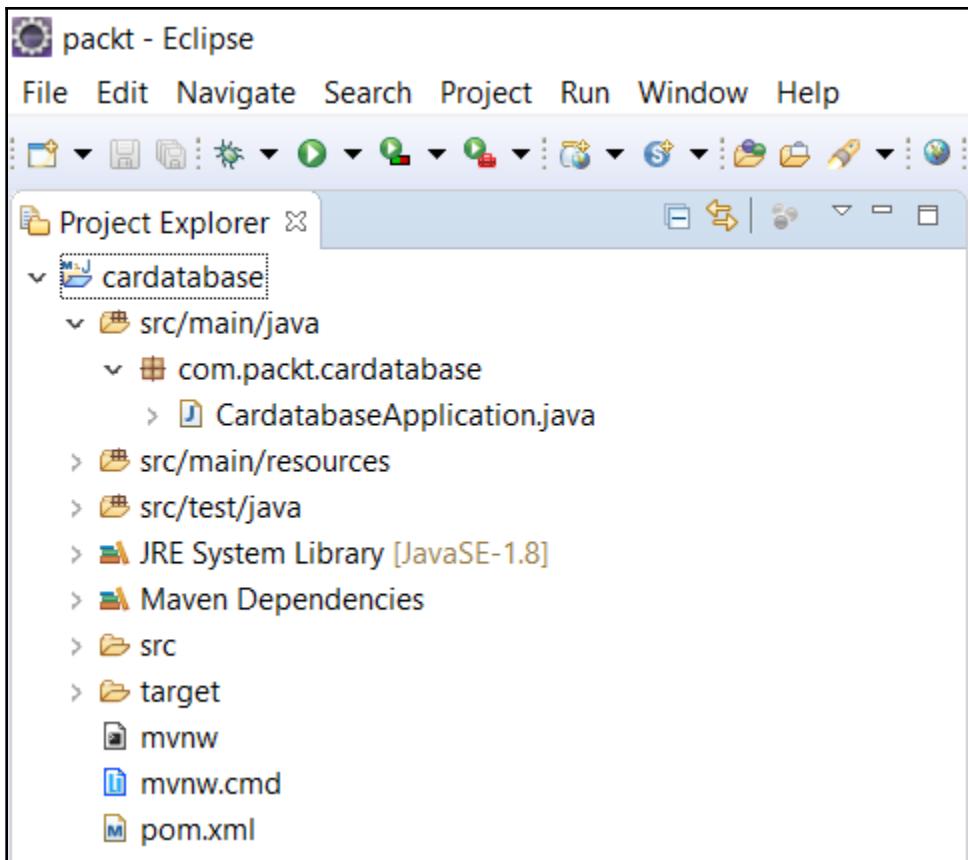
- Web:** Servlet web application with Spring MVC and Tomcat

Update dependencies

Cancel





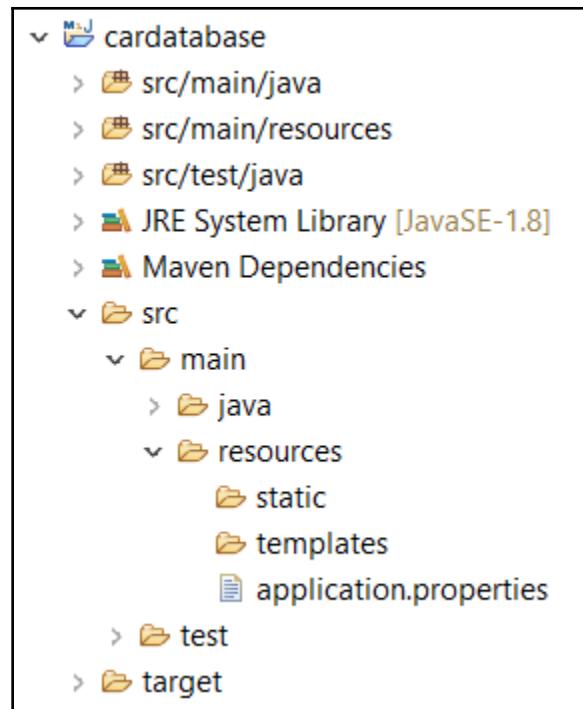


The screenshot shows the Eclipse IDE interface with the following details:

- Project Explorer:** Shows the project structure with `CardatabaseApplication.java` as the active file.
- Editor:** Displays the Java code for `CardatabaseApplication`, which is a Spring Boot application.
- Run As Context Menu:** A context menu is open over the code, with `Java Application` selected. Other options include `Run on Server` and `Run Configurations...`.
- Outline View:** Shows the class definition and its main method.
- Markers View:** Shows 0 items.
- Bottom Status Bar:** Shows the current file path: `com.packt.cardatabase.CardatabaseApplication.java - cardatabase/src/main/java`.

```
1 package com.packt.cardatabase;
2
3 import org.springframework.boot.SpringApplication;
4 import org.springframework.boot.autoconfigure.SpringBootApplication;
5
6 @SpringBootApplication
7 public class CardatabaseApplication {
8
9     public static void main(String[] args) {
10         SpringApplication.run(CardatabaseApplication.class, args);
11     }
12 }
```

```
CardatabaseApplication [Java Application] C:\Program Files\Java\jre1.8.0_101\bin\javaw.exe (21.4.2018 klo 13:54.38)
2018-04-21 13:54:42.003 INFO 9564 --- [ restartedMain] o.s.w.s.handler.SimpleUrlHandlerMapping : Mapped URL path [/**/favicon.ico] onto handler of type [class org.springframework.web.servlet.resource.ResourceHttpRequestHandler]
2018-04-21 13:54:42.301 INFO 9564 --- [ restartedMain] s.w.s.m.m.a.RequestMappingHandlerAdapter : Looking for @ControllerAdvice: org.springframework.boot.autoconfigure.web.servlet.error.BasicErrorController
2018-04-21 13:54:42.389 INFO 9564 --- [ restartedMain] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped “[/{error}]” onto public org.springframework.http.ResponseEntity<org.springframework.web.bind.support.ErrorAttributes> org.springframework.boot.autoconfigure.web.servlet.error.BasicErrorController#errorAttribute(Map)
2018-04-21 13:54:42.390 INFO 9564 --- [ restartedMain] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped “[/{error}.produce=[text/html]]” onto public org.springframework.http.ResponseEntity<java.util.Map<java.lang.String,java.util.List<java.lang.String>>> org.springframework.boot.autoconfigure.web.servlet.error.BasicErrorController#errorHtml(Map)
2018-04-21 13:54:42.423 INFO 9564 --- [ restartedMain] o.s.w.s.handler.SimpleUrlHandlerMapping : Mapped URL path [/webjars/**] onto handler of type [class org.springframework.web.servlet.handler.BeanNameUrlHandler]
2018-04-21 13:54:42.428 INFO 9564 --- [ restartedMain] o.s.w.s.handler.SimpleUrlHandlerMapping : Mapped URL path [/**] onto handler of type [class org.springframework.web.servlet.DispatcherServlet]
2018-04-21 13:54:42.656 INFO 9564 --- [ restartedMain] o.s.b.d.a.OptionalAutoReloadServer : LiveReload server is running on port 35729
2018-04-21 13:54:42.704 INFO 9564 --- [ restartedMain] o.s.j.e.a.AnnotationMBeanExporter : Registering beans for JMX exposure on startup
2018-04-21 13:54:42.837 INFO 9564 --- [ restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8080 (http) with context path ''
2018-04-21 13:54:42.841 INFO 9564 --- [ restartedMain] c.p.cardatabase.CardatabaseApplication : Started CardatabaseApplication in 3.627 seconds (JVM running for 3.627)
2018-04-21 13:54:42.847 INFO 9564 --- [ restartedMain] c.p.cardatabase.CardatabaseApplication : Hello Spring Boot
```



```

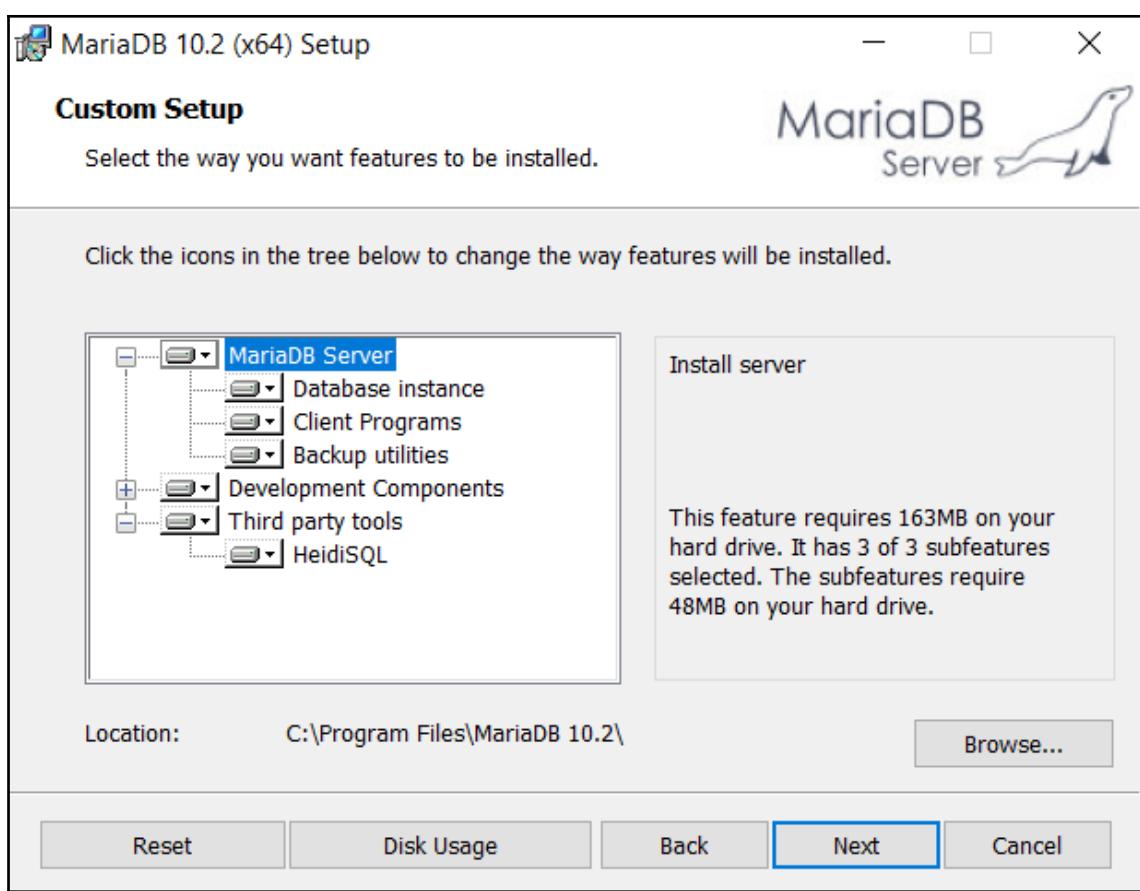
Markers Properties Servers Data Source Explorer Snippets Console
CardatabaseApplication [Java Application] C:\Program Files\Java\jre1.8.0_101\bin\javaw.exe (21.4.2018 klo 13.54.38)
2018-04-21 14:09:39.739 INFO 9564 --- [ restartedMain] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "[{/error}]" onto public org.springframework.http
2018-04-21 14:09:39.739 INFO 9564 --- [ restartedMain] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "[{/error},produces=[text/html]]" onto public org
2018-04-21 14:09:39.743 INFO 9564 --- [ restartedMain] o.s.w.s.handler.SimpleUrlHandlerMapping : Mapped URL path [/webjars/**] onto handler of type [clas
2018-04-21 14:09:39.743 INFO 9564 --- [ restartedMain] o.s.w.s.handler.SimpleUrlHandlerMapping : Mapped URL path [/**] onto handler of type [class org.spi
2018-04-21 14:09:39.777 INFO 9564 --- [ restartedMain] o.s.b.d.a.OptionalLiveReloadServer : LiveReload server is running on port 35729
2018-04-21 14:09:39.785 INFO 9564 --- [ restartedMain] o.s.j.e.a.AnnotationMBeanExporter : Registering beans for JMX exposure on startup
2018-04-21 14:09:39.793 INFO 9564 --- [ restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8080 (http) with context path
2018-04-21 14:09:39.793 INFO 9564 --- [ restartedMain] c.p.cardatabase.CardatabaseApplication : Started CardatabaseApplication in 0.518 seconds (JVM runn
2018-04-21 14:09:39.795 INFO 9564 --- [ restartedMain] .ConditionEvaluationDeltaLoggingListener : Condition evaluation unchanged
2018-04-21 14:09:39.795 INFO 9564 --- [ restartedMain] c.p.cardatabase.CardatabaseApplication : Hello Spring Boot

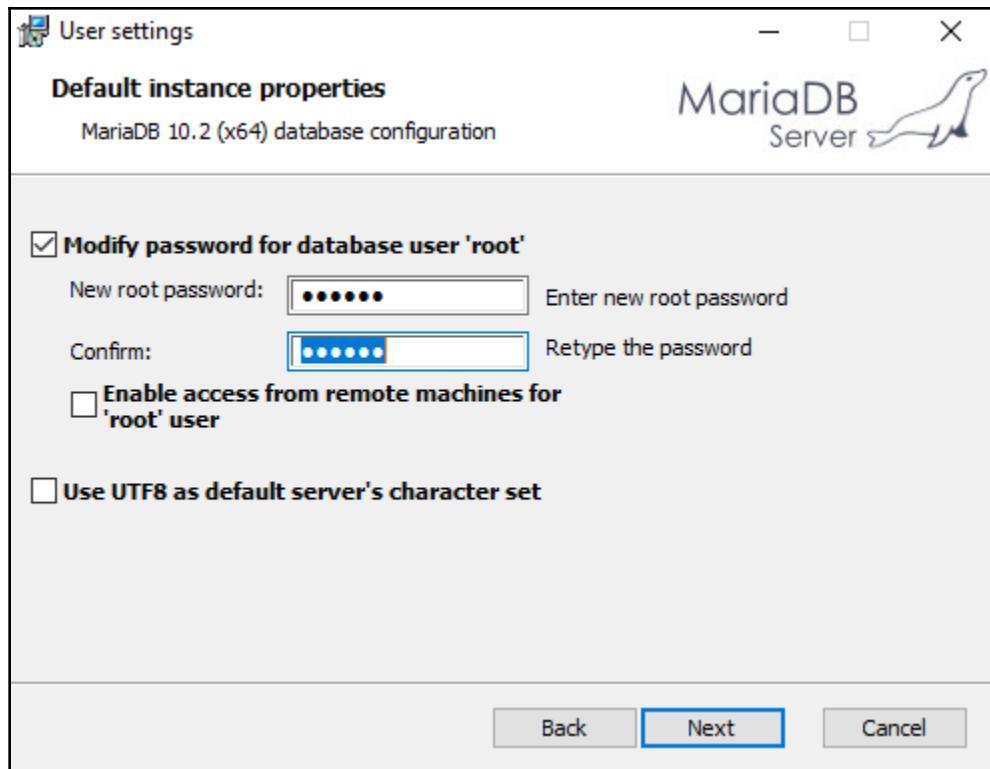
```

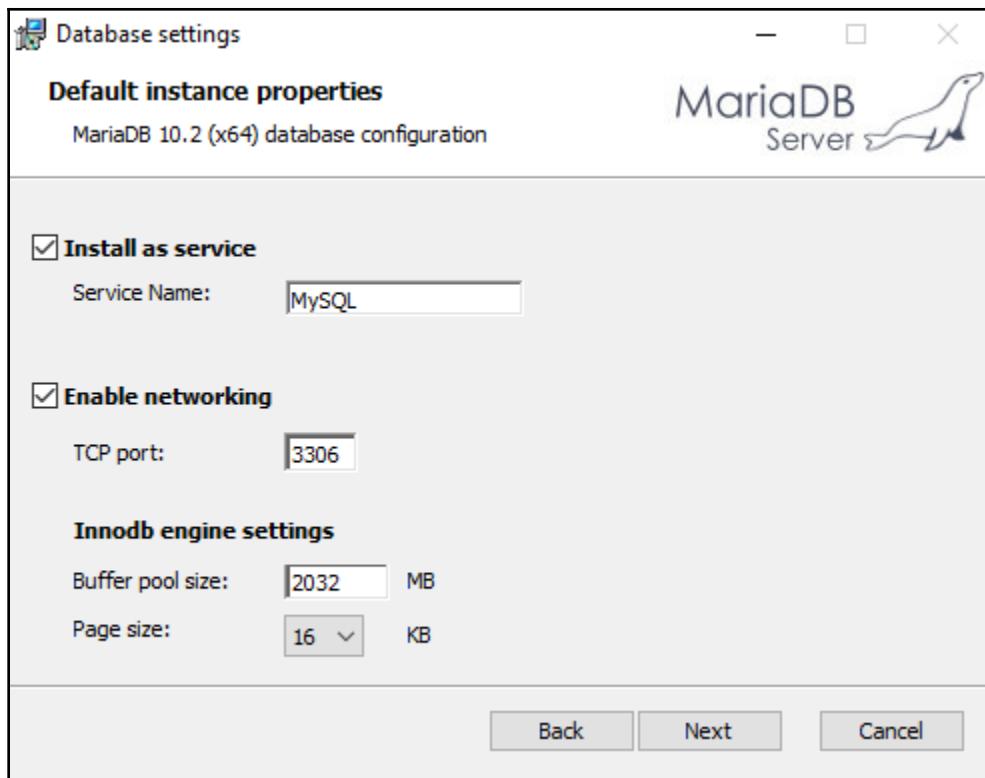
```

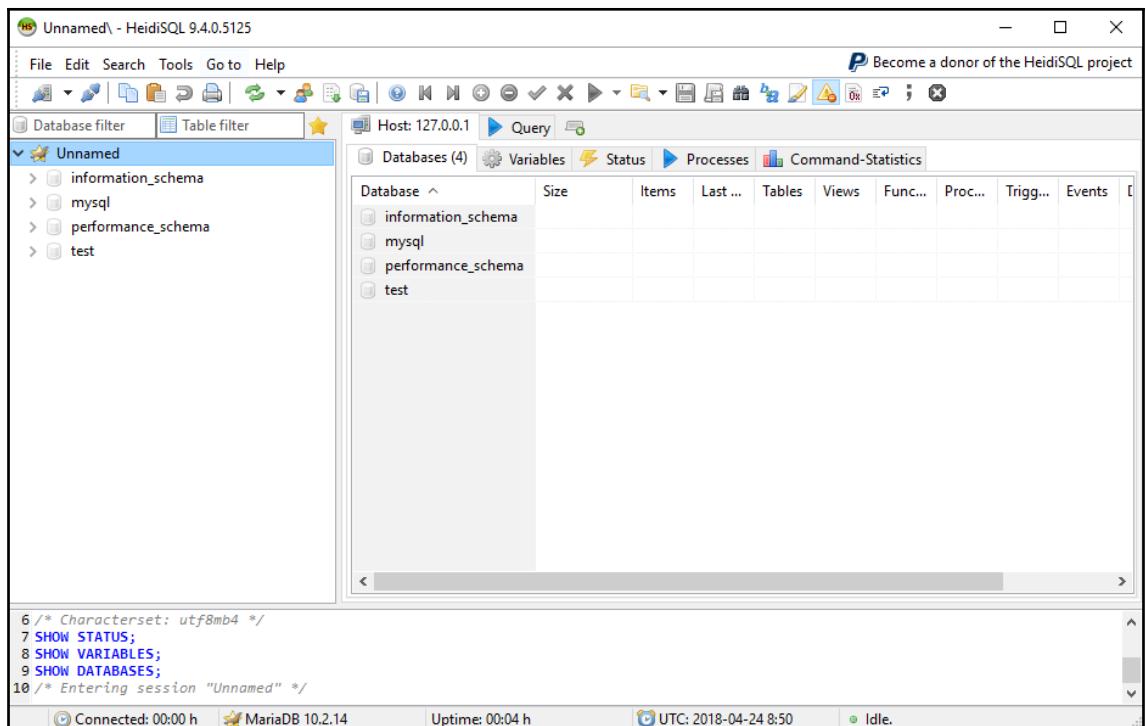
Markers Properties Servers Data Source Explorer Snippets Console
<terminated> CardatabaseApplication [Java Application] C:\Program Files\Java\jre1.8.0_101\bin\javaw.exe (21.4.2018 klo 14.42.46)
*****
APPLICATION FAILED TO START
*****
Description:
The Tomcat connector configured to listen on port 8080 failed to start. The port may already be in use or the connector may be misconfigured.
Action:
Verify the connector's configuration, identify and stop any process that's listening on port 8080, or configure this application to listen on another port.

```

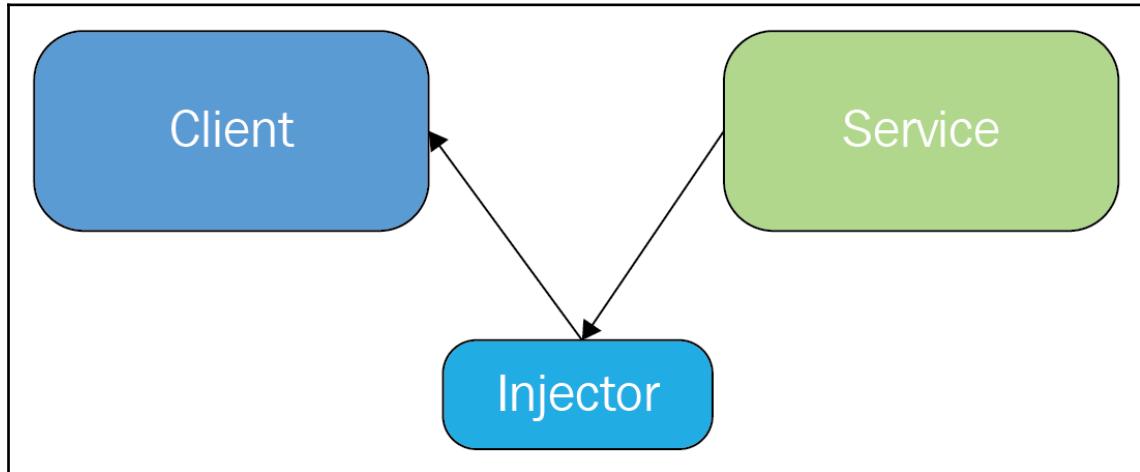




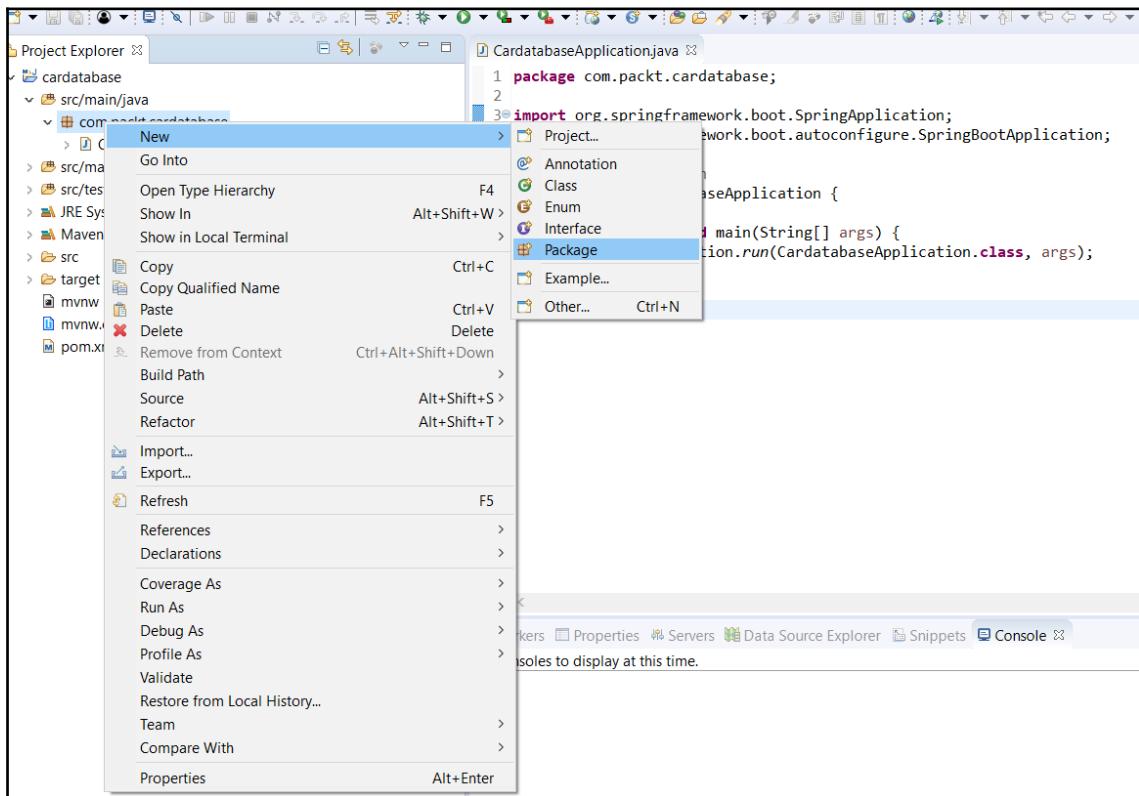


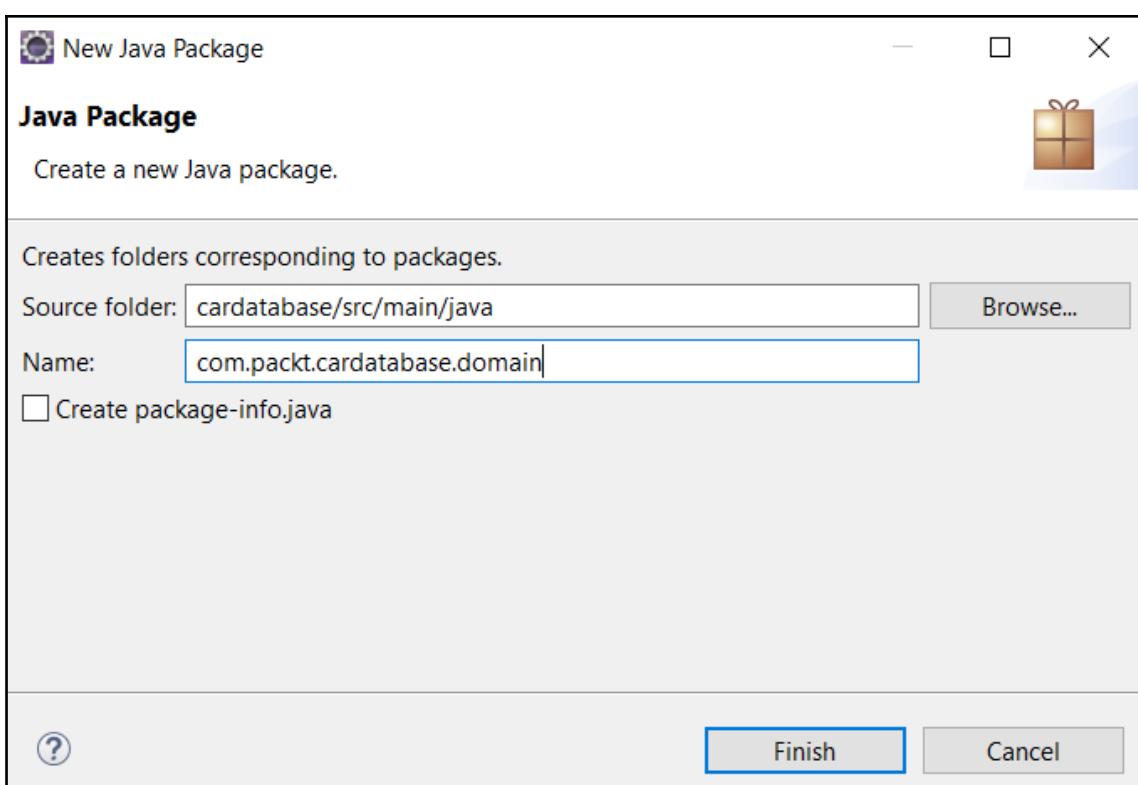


Chapter 2: Dependency Injection



Chapter 3: Using JPA to Create and Access a Database





New Java Class

Java Class

Create a new Java class.



Source folder:

Package:

Enclosing type:

Name:

Modifiers: public package private protected
 abstract final static

Superclass:

Interfaces:

Which method stubs would you like to create?

public static void main(String[] args)
 Constructors from superclass
 Inherited abstract methods

Do you want to add comments? (Configure templates and default value [here](#))

Generate comments

```
Markers Properties Servers Data Source Explorer Snippets Console 
CardatabaseApplication [Java Application] C:\Program Files\Java\jre1.8.0_101\bin\javaw.exe (214.2018 klo 19:32:58)
...
2018-04-21 19:33:03.356 INFO 14756 --- [ restartedMain] org.hibernate.Version : HHH000412: Hibernate Core {5.2.16.Final}
2018-04-21 19:33:03.358 INFO 14756 --- [ restartedMain] org.hibernate.cfg.Environment : HHH000206: hibernate.properties not found
2018-04-21 19:33:03.403 INFO 14756 --- [ restartedMain] o.hibernate.annotations.common.Version : HCANN000001: Hibernate Commons Annotations {5.0.1.Final}
2018-04-21 19:33:03.551 INFO 14756 --- [ restartedMain] org.hibernate.dialect.Dialect : HHH000400: Using dialect: org.hibernate.dialect.H2Dialect
Hibernate: drop table car if exists
Hibernate: drop sequence if exists hibernate_sequence
Hibernate: create sequence hibernate_sequence start with 1 increment by 1
Hibernate: create table car (id bigint not null, brand varchar(255), color varchar(255), model varchar(255), price integer not null, register_number varchar(255) )
2018-04-21 19:33:04.132 INFO 14756 --- [ restartedMain] o.h.t.schema.internal.SchemaCreatorImpl : HHH000416: Executing import script 'org.hibernate.tool.hbm2ddl:hibernate ddl.import'
2018-04-21 19:33:04.134 INFO 14756 --- [ restartedMain] j.LocalContainerEntityManagerFactoryBean : Initialized JPA EntityManagerFactory for persistence unit
2018-04-21 19:33:04.26A INFO 14756 --- [ restartedMain] o.s.w.c.HandlerSimulatorHandlerManninger : Mapped URL path /**/fauron onto handler of type >
<
```

← → ⌂ i localhost:8080/h2-console/login.jsp?jsessionid=860ee082

English ▾ Preferences Tools Help

Login

Saved Settings:

Setting Name:

Driver Class:

JDBC URL:

User Name:

Password:

localhost:8080/h2-console/login.do?jsessionid=860ee082e6b9b045ca28e498a6c10a2e

Auto commit | Max rows: 1000 | Auto complete | Off | Auto select | On | ?

SQL statement:

```

jdbc:h2:mem:testdb
CAR
  ID
  BRAND
  COLOR
  MODEL
  PRICE
  REGISTER_NUMBER
  YEAR
Indexes
INFORMATION_SCHEMA
Sequences
Users
H2 1.4.197 (2018-03-18)

```

Important Commands

	Displays this Help Page
	Shows the Command History
	Executes the current SQL statement
	Executes the SQL statement defined by the text selection
	Auto complete
	Disconnects from the database

Markers Properties Servers Data Source Explorer Snippets Console

CardatabaseApplication [Java Application] C:\Program Files\Java\jre1.8.0_101\bin\javaw.exe (22.4.2018 klo 14.49.58)

```

2018-04-22 14:50:04.170 INFO 6912 --- [ restartedMain] o.s.j.e.a.AnnotationMBeanExporter      : Bean with name 'dataSource' has
2018-04-22 14:50:04.175 INFO 6912 --- [ restartedMain] o.s.j.e.a.AnnotationMBeanExporter      : Located MBean 'dataSource': reg
2018-04-22 14:50:04.214 INFO 6912 --- [ restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8080
2018-04-22 14:50:04.218 INFO 6912 --- [ restartedMain] c.p.cardatabase.CardatabaseApplication   : Started CardatabaseApplication
Hibernate: call next value for hibernate_sequence
Hibernate: insert into car (brand, color, model, price, register_number, year, id) values (?, ?, ?, ?, ?, ?, ?, ?)
Hibernate: call next value for hibernate_sequence
Hibernate: insert into car (brand, color, model, price, register_number, year, id) values (?, ?, ?, ?, ?, ?, ?, ?)
Hibernate: call next value for hibernate_sequence
Hibernate: insert into car (brand, color, model, price, register_number, year, id) values (?, ?, ?, ?, ?, ?, ?, ?)

```

Auto commit | Max rows: 1000 | Auto complete Off | Auto select On | ?

jdbc:h2:mem:testdb | CAR | OWNER | INFORMATION_SCHEMA | Sequences | Users | H2 1.4.197 (2018-03-18)

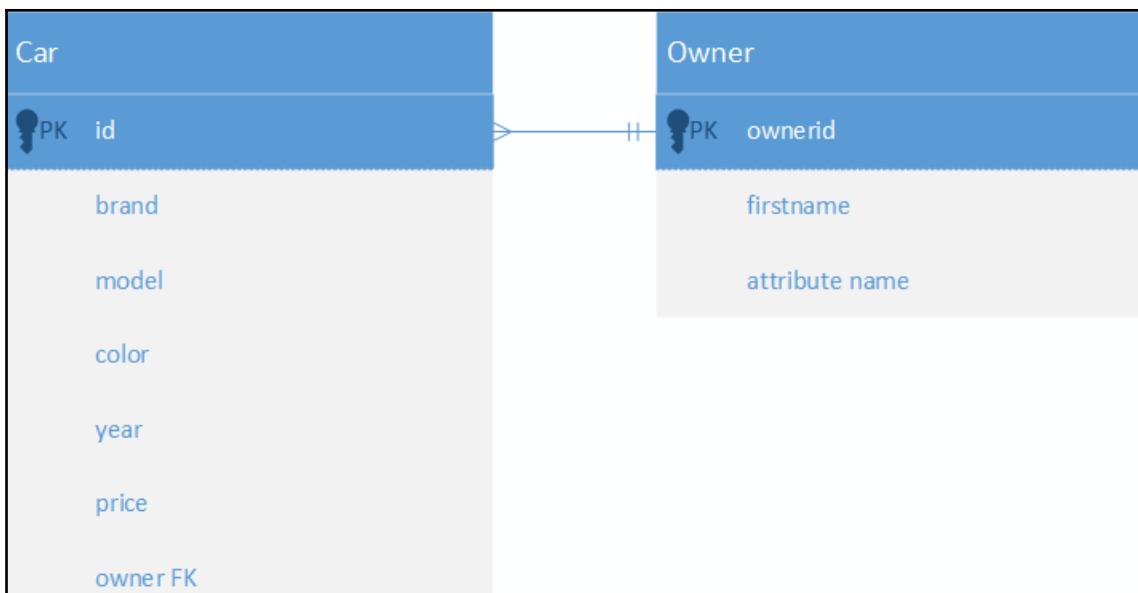
Run | Run Selected | Auto complete | Clear | SQL statement:

```
select * from car
```

select * from car;

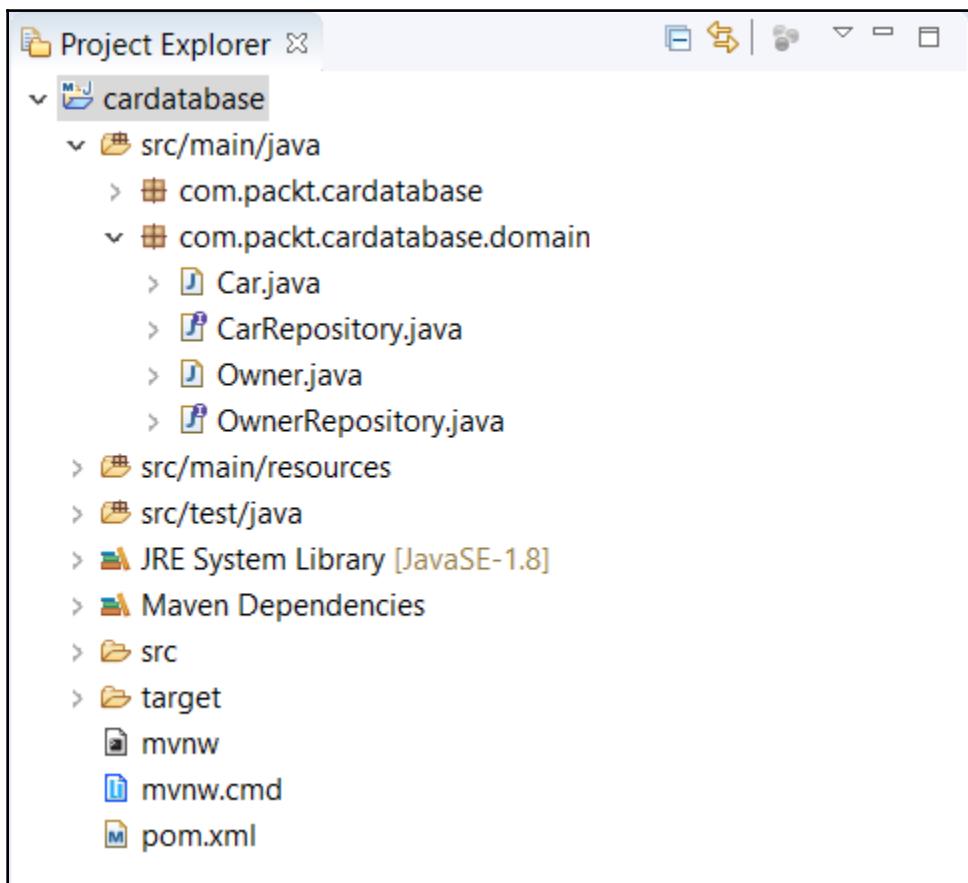
ID	BRAND	COLOR	MODEL	PRICE	REGISTER_NUMBER	YEAR	OWNER
3	Ford	Red	Mustang	59000	ADF-1121	2017	1
4	Nissan	White	Leaf	29000	SSJ-3002	2014	2
5	Toyota	Silver	Prius	39000	KKO-0212	2018	2

(3 rows, 4 ms)



The screenshot shows the Eclipse IDE's Console view with the following log output:

```
CardatabaseApplication [Java Application] C:\Program Files\Java\jre1.8.0_101\bin\javaw.exe (22.4.2018 klo 14:49:58)
2018-04-22 16:17:17.441 INFO 6912 --- [ restartedMain] org.hibernate.dialect.Dialect : HHH000400: Using dialect: org.hibernate.dialect.H2Dialect
Hibernate: drop table car if exists
Hibernate: drop table owner if exists
Hibernate: drop sequence if exists hibernate_sequence
Hibernate: create sequence hibernate_sequence start with 1 increment by 1
Hibernate: create table car (id bigint not null, brand varchar(255), color varchar(255), model varchar(255), price integer not null, register_number varchar(255), primary key (id))
Hibernate: create table owner (ownerid bigint not null, firstname varchar(255), lastname varchar(255), primary key (ownerid))
2018-04-22 16:17:17.474 INFO 6912 --- [ restartedMain] o.m.c.Schema.internal.SchemaCreatorImpl : hibernate:400: Executing import script org.hibernate.tool.schema.internal.SchemaCreatorImpl$ImportScript@55e00040:0. Initializing JPA EntityManagerFactory for persistence unit 'cardatabase'
2018-04-22 16:17:17.475 INFO 6912 --- [ restartedMain] j.LocalContainerEntityManagerFactoryBean : Initialized JPA EntityManagerFactory for persistence unit 'cardatabase'
2018-04-22 16:17:17.538 INFO 6912 --- [ restartedMain] o.s.w.s.handler.SimpleUrlHandlerMapping : Mapped URL path [/**/favicon.ico] onto handler of type [org.springframework.web.servlet.handler.SimpleUrlHandlerMapping]
2018-04-22 16:17:17.598 INFO 6912 --- [ restartedMain] s.w.s.m.m.a.RequestMappingHandlerAdapter : Looking for @ControllerAdvice: org.springframework.boot.autoconfigure.web.servlet.error.WebMvcErrorController
2018-04-22 16:17:17.603 WARN 6912 --- [ restartedMain] aWebConfiguration$JpaWebMvcConfiguration : spring.io.ia.open-in-view is enabled by default. Therefore, <
```



```

Markers Properties Servers Data Source Explorer Snippets Console
CardatabaseApplication [Java Application] C:\Program Files\Java\jre1.8.0_101\bin\javaw.exe (22.4.2018 klo 17.51.54)
2018-04-22 17:51:58.963 INFO 16596 --- [ restartedmain] o.n.t.schema.internal.SchemaReactorImpl : HHH000476: Executing import script 'org.hibernate.tool.hbm2ddl.SchemaUpdateScript'
2018-04-22 17:51:58.966 INFO 16596 --- [ restartedmain] j.LocalContainerEntityManagerFactoryBean : Initialized JPA EntityManagerFactory for persistence unit 'cardb'
2018-04-22 17:51:59.489 INFO 16596 --- [ restartedmain] o.s.w.s.handler.SimpleUrlHandlerMapping : Mapped URL path [/**/favicon.ico] onto handler of type [org.springframework.boot.web.servlet.error.ErrorMvcHandler]
2018-04-22 17:51:59.766 INFO 16596 --- [ restartedmain] s.w.s.m.m.a.RequestMappingHandlerAdapter : Looking for @ControllerAdvice: org.springframework.boot.web.servlet.error.ErrorMvcHandler

```

Auto commit Max rows: 1000 Auto complete Off Auto select On

jdbc:h2:mem:testdb

Run Run Selected Auto complete Clear SQL statement:

```
select * from car
```

ID	BRAND	COLOR	MODEL	PRICE	REGISTER_NUMBER	YEAR	OWNER
3	Ford	Red	Mustang	59000	ADF-1121	2017	1
4	Nissan	White	Leaf	29000	SSJ-3002	2014	2
5	Toyota	Silver	Prius	39000	KKO-0212	2018	2

(3 rows, 4 ms)

File Edit Search Tools Go to Help

Database filter Table filter

Host: 127.0.0.1 Database: cardb Query

Name	Rows	Size	Created	Updated	Engine	Comment
car	0	16,0 KiB	2018-04-25 14:47:49		InnoDB	
car_owner	0	32,0 KiB	2018-04-25 14:47:49		InnoDB	
hibernate_sequenc...	2	16,0 KiB	2018-04-25 14:47:49	2018-04-25 14:47:51	InnoDB	
owner	2	16,0 KiB	2018-04-25 14:47:50	2018-04-25 14:47:51	InnoDB	

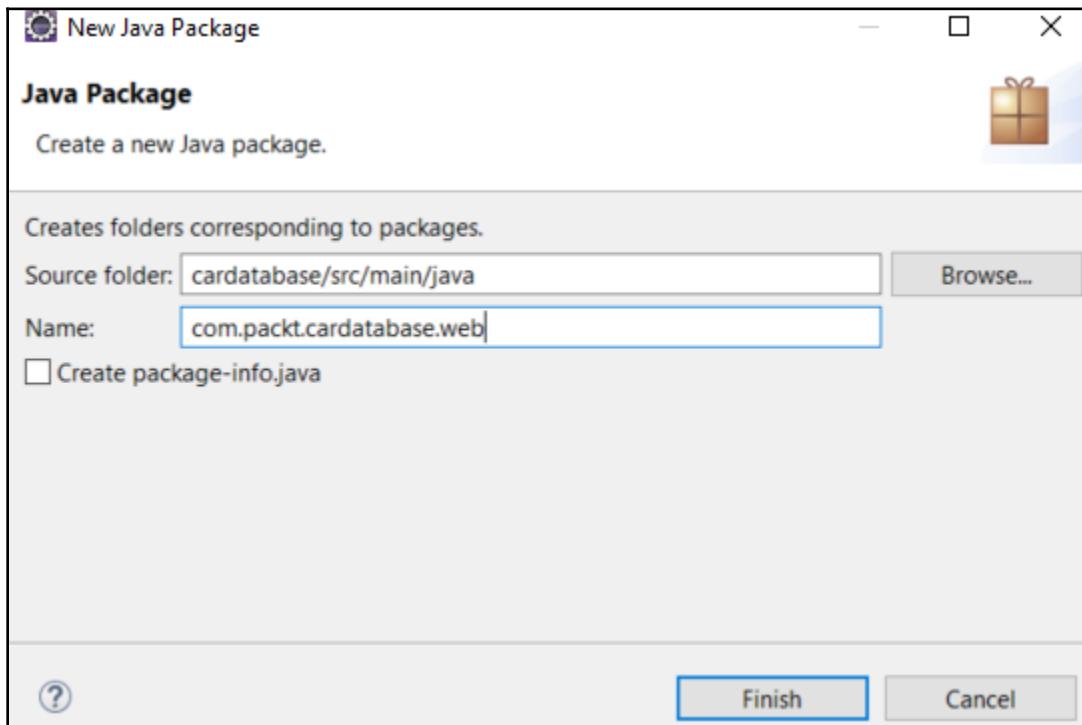
The screenshot shows the HeidiSQL interface. On the left is a tree view of databases: Unnamed, information_schema (176,0 KiB), mysql (0 B), performance_schema (0 B), and test (0 B). A context menu is open over the 'test' database, listing options like Edit, Drop, Empty table(s), Run routine(s), Create new, Export database as SQL, Maintenance, Find text on server, Bulk table editor, Expand all, Collapse all, Tree style options, Print, Refresh, and Disconnect. The main pane displays database statistics for Host: 127.0.0.1, including Databases (4), Variables, Status, Processes, and Command-Statistics. Below the stats is a table with columns: Database, Size, Items, Last ..., Tables, Views, Func..., Proc..., Trigg..., Events. The 'information_schema' row shows 176,0 KiB, 75 items, 2018..., 75 tables, 0 views, 0 functions, 0 procedures, 0 triggers, and 0 events. The 'mysql' row shows 0 B, 52 items, 52 tables, 0 views, 0 functions, 0 procedures, 0 triggers, and 0 events. The 'performance schema' row shows 0 B, 0 items, 0 tables, 0 views, 0 functions, 0 procedures, 0 triggers, and 0 events. The bottom pane shows a query history with several SHOW STATUS and SELECT * queries from the 'test' database. The status bar at the bottom indicates a connection time of 52 h, UTC: 2018-04-23 16:59, and the database is Idle.

This screenshot shows the database tree in HeidiSQL. The 'cardb' database is selected and highlighted in blue. Other databases listed are information_schema, mysql, performance_schema, and test. The status bar at the bottom is not visible in this specific screenshot.

The screenshot shows the HeidiSQL interface for a database named 'cardb'. The left pane displays the database structure with tables: car, car_owner, hibernate_sequence, and owner. The right pane shows a detailed table of these four tables with columns: Name, Rows, Size, Created, Updated, Engine, and Comment. The 'car' and 'car_owner' tables have 0 rows and 16,0 KiB size. The 'hibernate_sequence' and 'owner' tables have 2 rows and 16,0 KiB size. All tables were created and updated on 2018-04-25 14:47:49, and their engines are InnoDB.

Name	Rows	Size	Created	Updated	Engine	Comment
car	0	16,0 KiB	2018-04-25 14:47:49		InnoDB	
car_owner	0	32,0 KiB	2018-04-25 14:47:49		InnoDB	
hibernate_sequence	2	16,0 KiB	2018-04-25 14:47:49	2018-04-25 14:47:51	InnoDB	
owner	2	16,0 KiB	2018-04-25 14:47:50	2018-04-25 14:47:51	InnoDB	

Chapter 4: Creating a RESTful Web Service with Spring Boot



 New Java Class

Java Class

Create a new Java class.



Source folder:

Package:

Enclosing type:

Name:

Modifiers: public package private protected
 abstract final static

Superclass:

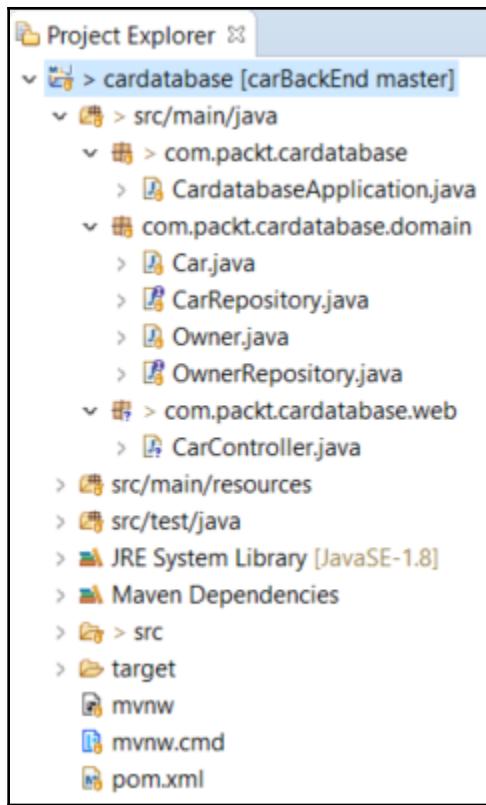
Interfaces:

Which method stubs would you like to create?

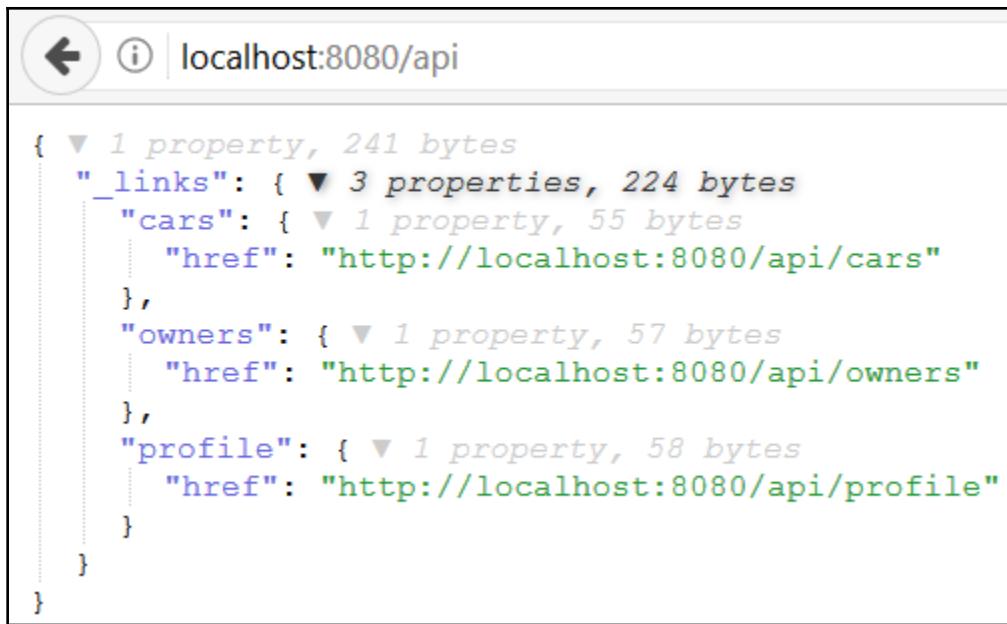
public static void main(String[] args)
 Constructors from superclass
 Inherited abstract methods

Do you want to add comments? (Configure templates and default value [here](#))

Generate comments



```
[▼ 3 items, 502 bytes
{▼ 7 properties, 164 bytes
"brand": "Ford",
"model": "Mustang",
"color": "Red",
"registerNumber": "ADF-1121",
"year": 2017,
"price": 59000,
"owner": {▼ 3 properties, 53 bytes
"ownerid": 1,
"firstname": "John",
"lastname": "Johnson"
},
},
{▼ 7 properties, 166 bytes
"brand": "Nissan",
"model": "Leaf",
"color": "White",
"registerNumber": "SSJ-3002",
"year": 2014,
"price": 29000,
"owner": {▼ 3 properties, 54 bytes
"ownerid": 2,
"firstname": "Mary",
"lastname": "Robinson"
},
},
{▼ 7 properties, 168 bytes
"brand": "Toyota",
"model": "Prius",
"color": "Silver",
"registerNumber": "KKO-0212",
"year": 2018,
"price": 39000,
"owner": {▼ 3 properties, 54 bytes
"ownerid": 2,
"firstname": "Mary",
"lastname": "Robinson"
}
}]
```



A screenshot of a web browser window displaying a JSON object. The address bar shows "localhost:8080/api". The JSON structure is as follows:

```
{ ▼ 1 property, 241 bytes
  "_links": { ▼ 3 properties, 224 bytes
    "cars": { ▼ 1 property, 55 bytes
      "href": "http://localhost:8080/api/cars"
    },
    "owners": { ▼ 1 property, 57 bytes
      "href": "http://localhost:8080/api/owners"
    },
    "profile": { ▼ 1 property, 58 bytes
      "href": "http://localhost:8080/api/profile"
    }
  }
}
```

GET ▾ http://localhost:8080/api/cars

Body Cookies (1) Headers (3) Test Results

Pretty Raw Preview JSON ▾

```
1 ▾ []
2 ▾   "_embedded": {
3 ▾     "cars": [
4 ▾       {
5 ▾         "brand": "Ford",
6 ▾         "model": "Mustang",
7 ▾         "color": "Red",
8 ▾         "registerNumber": "ADF-1121",
9 ▾         "year": 2017,
10        "price": 59000,
11        "_links": {
12          "self": {
13            "href": "http://localhost:8080/api/cars/3"
14          },
15          "car": {
16            "href": "http://localhost:8080/api/cars/3"
17          },
18          "owner": {
19            "href": "http://localhost:8080/api/cars/3/owner"
20          }
21        }
22      },
23      {
24        "brand": "Nissan",
25        "model": "Leaf",
26        "color": "White",
27        "registerNumber": "SSJ-3002",
28        "year": 2014,
29        "price": 29000,
30        "_links": {
31          "self": {
```

GET ▼ http://localhost:8080/api/cars/3/owner

Body Cookies (1) Headers (4) Test Results

Pretty Raw Preview JSON ▼

```
1 {  
2   "firstname": "John",  
3   "lastname": "Johnson",  
4   "_links": {  
5     "self": {  
6       "href": "http://localhost:8080/api/owners/1"  
7     },  
8     "owner": {  
9       "href": "http://localhost:8080/api/owners/1"  
10    },  
11    "cars": {  
12      "href": "http://localhost:8080/api/owners/1/cars"  
13    }  
14  }  
15 }
```

root@HJMXX4717: ~

```
root@HJMXX4717:~# curl -X "DELETE" http://localhost:8080/api/cars/4
```

POST ▾ http://localhost:8080/api/cars

Authorization Headers (1) Body ● Pre-request Script Tests

form-data x-www-form-urlencoded raw binary **JSON (application/json)** ▾

```
1 <pre>{  
2   "brand": "Toyota",  
3   "model": "Corolla",  
4   "color": "black",  
5   "year": 2017,  
6   "price": 31000  
7 }</pre>
```

GET ▼ http://localhost:8080/api/cars

Pretty Raw Preview JSON ▼

```
20
21
22
23 ▾
24
25
26
27
28
29
30 ▾
31 ▾
32
33
34 ▾
35
36
37 ▾
38
39
40
41
42
43
```

}

},

{

 "brand": "Toyota",
 "model": "Corolla",
 "color": "black",
 "registerNumber": null,
 "year": 2017,
 "price": 31000,
 "_links": {
 "self": {
 "href": "http://localhost:8080/api/cars/6"
 },
 "car": {
 "href": "http://localhost:8080/api/cars/6"
 },
 "owner": {
 "href": "http://localhost:8080/api/cars/6/owner"
 }
 }
}

]

},

PATCH ▼ http://localhost:8080/api/cars/6

Authorization Headers (1) Body ● Pre-request Script Tests

form-data x-www-form-urlencoded raw binary **JSON (application/json)** ▼

```
1 ▾ {  
2   "color": "white",  
3   "registerNumber": "AAR-3440",  
4   "owner": "http://localhost:8080/api/owners/1"  
5 }
```

GET ▼ http://localhost:8080/api/cars

Pretty Raw Preview JSON ▼

59 }

60 },

61 {

62 "brand": "Toyota",

63 "model": "Corolla",

64 "color": "white",

65 "registerNumber": "AAR-3440",

66 "year": 2017,

67 "price": 31000,

68 "_links": {

69 "self": {

70 "href": "http://localhost:8080/api/cars/6"

71 },

72 "car": {

73 "href": "http://localhost:8080/api/cars/6"

74 },

75 "owner": {

76 "href": "http://localhost:8080/api/cars/6/owner"

77 }

78 }

79 },

80]

81 },

GET ▼ http://localhost:8080/api/cars/search

Pretty Raw Preview JSON ▼

```
1 [
2   "_links": {
3     "findByBrand": {
4       "href": "http://localhost:8080/api/cars/search/findByBrand{?brand}",
5       "templated": true
6     },
7     "findByColor": {
8       "href": "http://localhost:8080/api/cars/search/findByColor{?color}",
9       "templated": true
10    },
11    "self": {
12      "href": "http://localhost:8080/api/cars/search"
13    }
14  }
15 ]
```

GET ▼ http://localhost:8080/api/cars/search/findByBrand?brand=Ford

Pretty Raw Preview JSON ▼ ⚙

```
1 {  
2   "_embedded": {  
3     "cars": [  
4       {  
5         "brand": "Ford",  
6         "model": "Mustang",  
7         "color": "Red",  
8         "registerNumber": "ADF-1121",  
9         "year": 2017,  
10        "price": 59000,  
11        "_links": {  
12          "self": {  
13            "href": "http://localhost:8080/api/cars/3"  
14          },  
15          "car": {  
16            "href": "http://localhost:8080/api/cars/3"  
17          },  
18          "owner": {  
19            "href": "http://localhost:8080/api/cars/3/owner"  
20          }  
21        }  
22      }  
23    ],  
24  },  
},  
]  
}
```

Chapter 5: Securing and Testing Your Backend

The screenshot shows the Eclipse IDE interface with the Java Application perspective selected. A terminal window at the bottom displays application logs from 2018-04-29 17:41:49.387 to 17:41:49.673. The logs show the application restarting, mapping URLs to controllers, and generating a security password.

```
Overview | Dependencies | Dependency Hierarchy | Effective POM | pom.xml  
Markers Properties Servers Data Source Explorer Snippets Console JUnit  
CardatabaseApplication [Java Application] C:\Program Files\Java\jre1.8.0_101\bin\javaw.exe (24.4-2018-b6 17.41.42)  
2018-04-29 17:41:49.387 INFO 4460 --- [ restartedMain] o.s.d.r.w.BasePathAwareHandlerMapping : Mapped "[/{api}/profile],methods=[GET]" onto org.springframework.  
2018-04-29 17:41:49.673 INFO 4460 --- [ restartedMain] .s.s.UserDetailsServiceAutoConfiguration :  
Using generated security password: 8ff17db6-f297-46d9-8b75-330d1927e5ab  
2018-04-29 17:41:49.881 INFO 4460 --- [ restartedMain] o.s.s.web.DefaultSecurityFilterChain : Creating filter chain: org.springframework.security.web.util...  
2018-04-29 17:41:49.980 INFO 4460 --- [ restartedMain] o.s.b.d.a.OptionalLocalReloadServer : LiveReload server is running on port 35729  
2018-04-29 17:41:50.023 INFO 4460 --- [ restartedMain] o.s.j.e.a.AnnotationMBeanExporter : Registering beans for JMX exposure on startup  
2018-04-29 17:41:50.023 INFO 4460 --- [ restartedMain] o.s.j.e.a.AnnotationMBeanExporter :
```

The screenshot shows a terminal window with the command `curl http://localhost:8080/api` being run. The response indicates an unauthorized status (401) with the message "Unauthorized".

```
root@HMX4717:~# curl http://localhost:8080/api  
{"timestamp": "2018-04-29T16:33:23.004+0000", "status": 401, "error": "Unauthorized", "message": "Unauthorized", "path": "/api"}root@HMX4717:~#
```

The screenshot shows the Postman application interface. A GET request is made to `http://localhost:8080/api`. The response body is displayed in JSON format, showing the root object with links to owners, cars, and profile.

Request Details:

- Type: GET
- URL: `http://localhost:8080/api`
- Method: Send

Authorization:

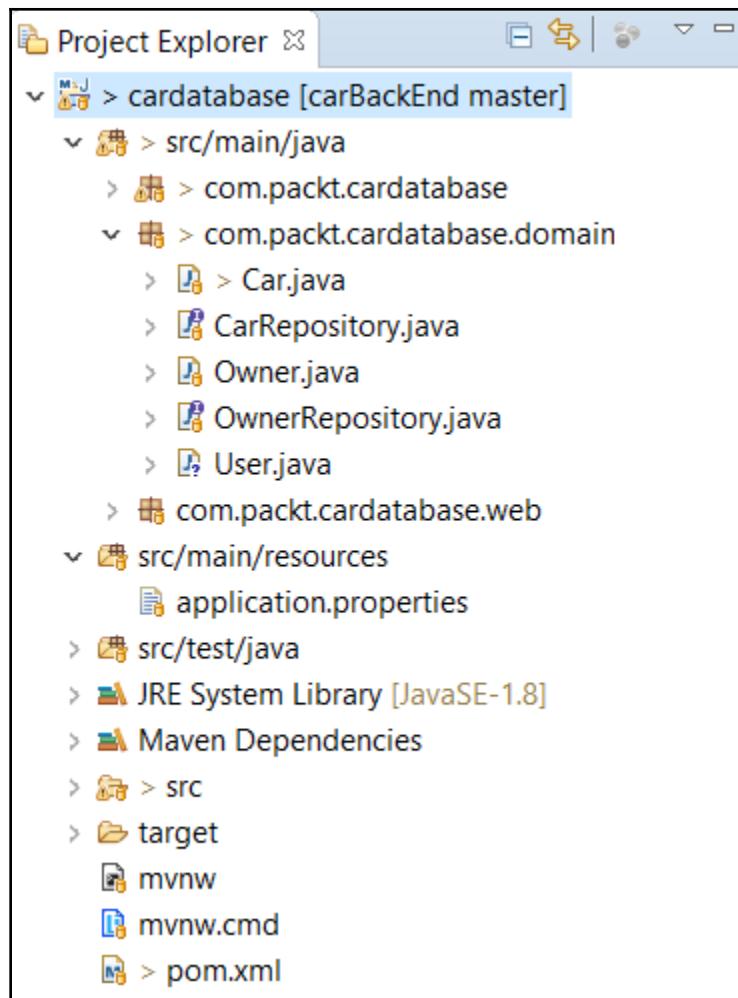
- Basic Auth

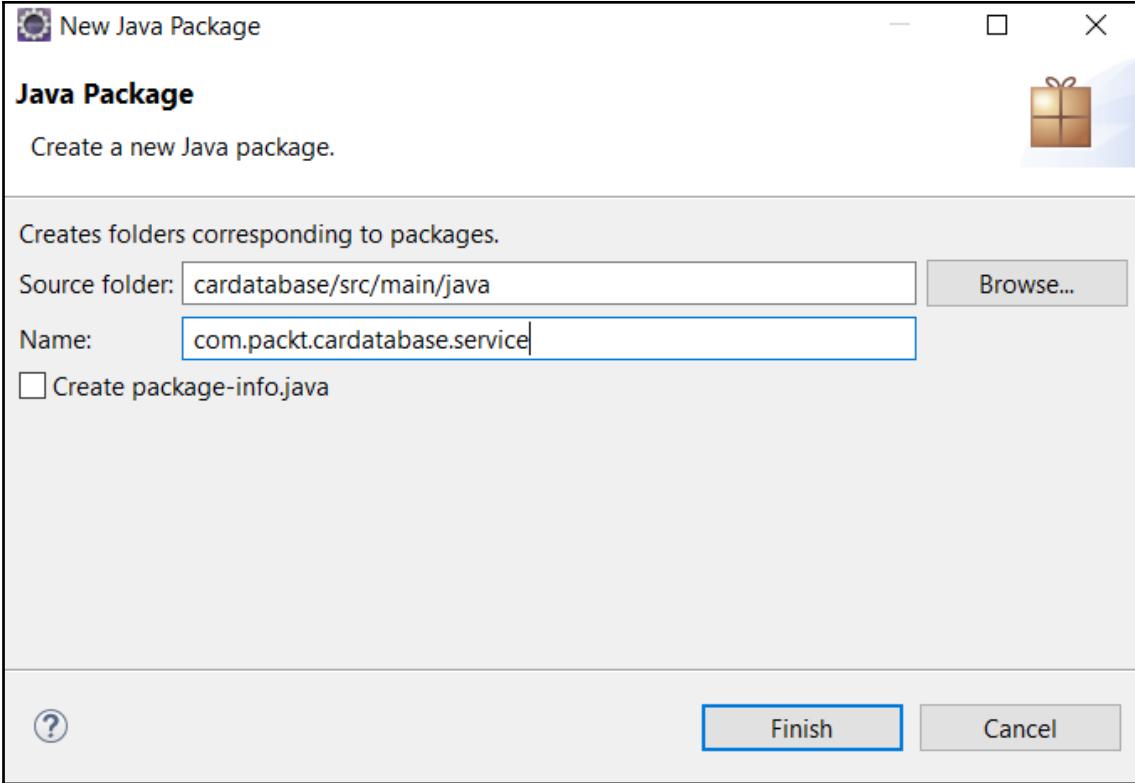
Response Headers:

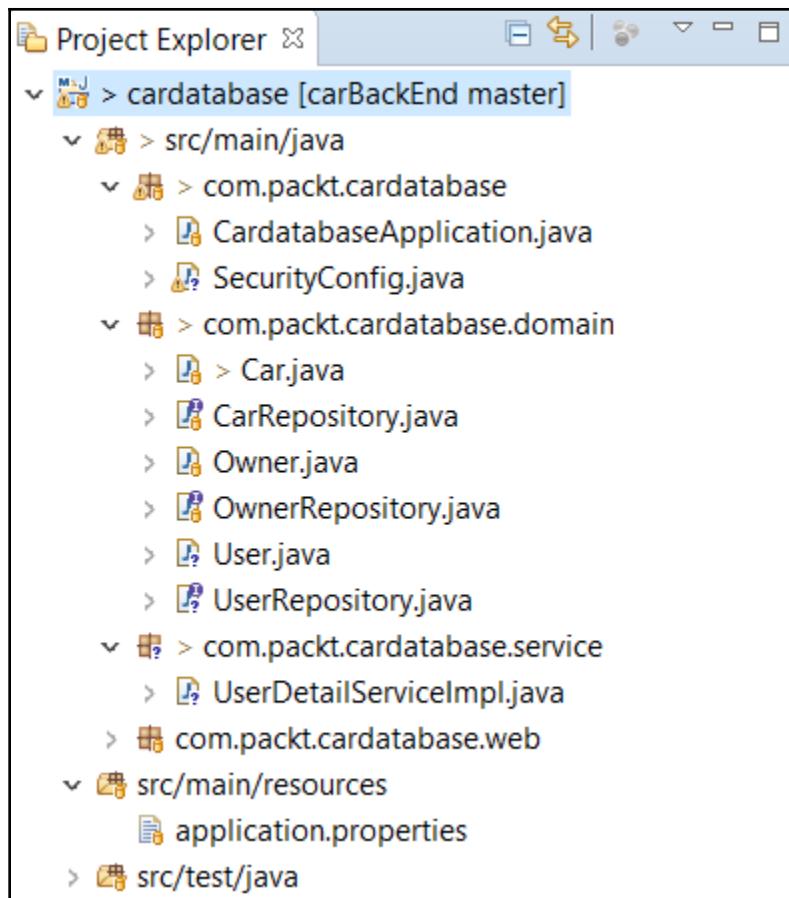
- Content-Type: application/json
- Content-Length: 103
- Date: Mon, 29 Apr 2018 16:33:23 GMT
- Server: Apache-Coyote/1.1

Body (JSON):

```
1 {  
2   "_links": {  
3     "owners": {  
4       "href": "http://localhost:8080/api/owners"  
5     },  
6     "cars": {  
7       "href": "http://localhost:8080/api/cars"  
8     },  
9     "profile": {  
10       "href": "http://localhost:8080/api/profile"  
11     }  
12   }  
13 }
```







The screenshot shows the HeidiSQL interface connected to a MySQL database named 'cardb' on host '127.0.0.1'. The database structure is:

- Database filter
- Table filter
- Host: 127.0.0.1
- Database: cardb
- Table: user
- Data
- Query

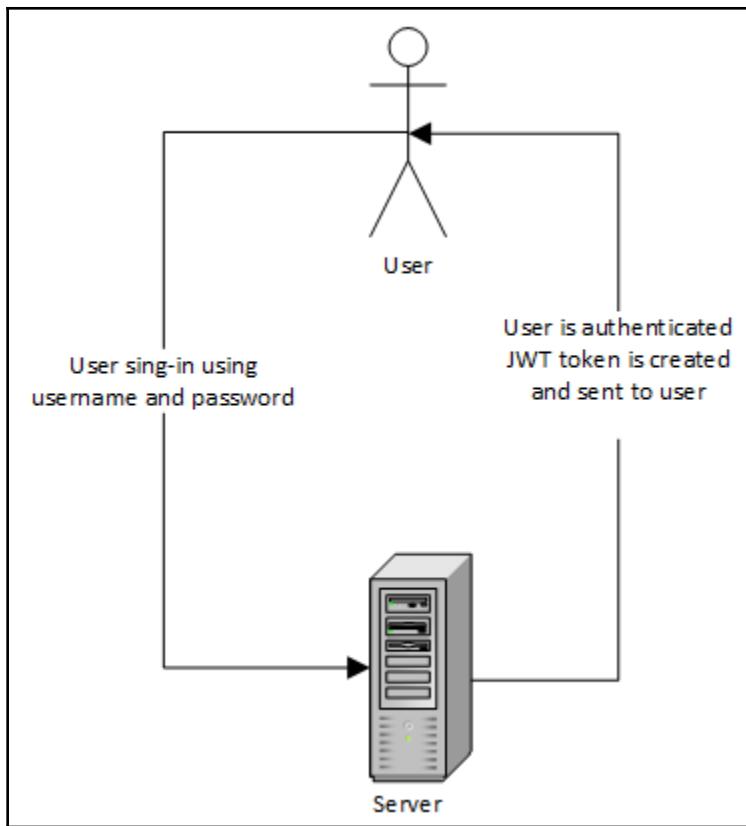
The 'user' table contains the following data:

	id	password	role	username
1	1	\$2a\$04\$1.YhMigNX/8TkCKGFUONWO1waedKhQ5KrnB30...	USER	user
2	2	\$2a\$04\$KNLUwOWHVQZ/pXyMBNc7J0zbLIBjb9Tk9bP7K...	ADMIN	admin



root@HMX4717: ~

```
root@HMX4717:~# curl http://localhost:8080/api -u admin
Enter host password for user 'admin':
{
  "_links" : {
    "owners" : {
      "href" : "http://localhost:8080/api/owners"
    },
    "users" : {
      "href" : "http://localhost:8080/api/users"
    },
    "cars" : {
      "href" : "http://localhost:8080/api/cars"
    },
    "profile" : {
      "href" : "http://localhost:8080/api/profile"
    }
  }
}root@HMX4717:~#
```



POST <http://localhost:8080/login>

Params Send Save

Authorization Headers Body Pre-request Script Tests Cookies Code

Body (radio buttons): form-data, x-www-form-urlencoded, raw (selected), binary, Text

```
1 {"username": "admin", "password": "admin"}
```

Headers (10) Test Results Status: 200 OK Time: 455 ms Size: 478 B

Access-Control-Expose-Headers → Authorization

Authorization → Bearer eyJhbGciOiJIUzIwMjUyJ... (long token)

GET ▼ http://localhost:8080/api/cars

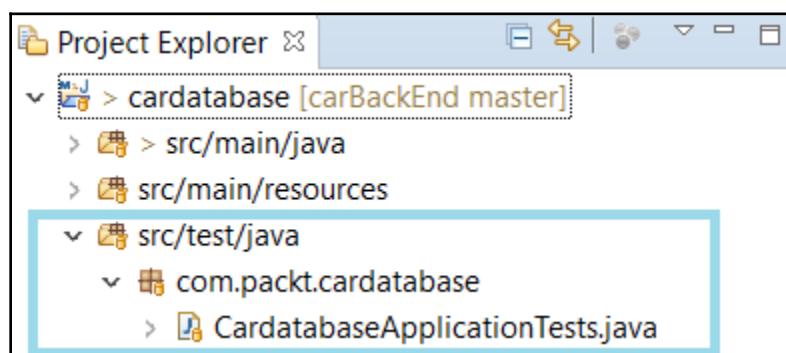
Authorization Headers (1) Body Pre-request Script Tests

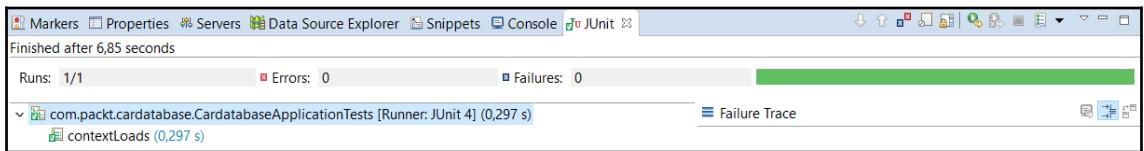
Key	Value
Authorization	eyJhbGciOiJIUzUxMiJ9eyJzdWlIiOiJhZG1pbmlsImV4cCI6MTUyNTMz... New key Value

Body Cookies (1) Headers (10) Test Results

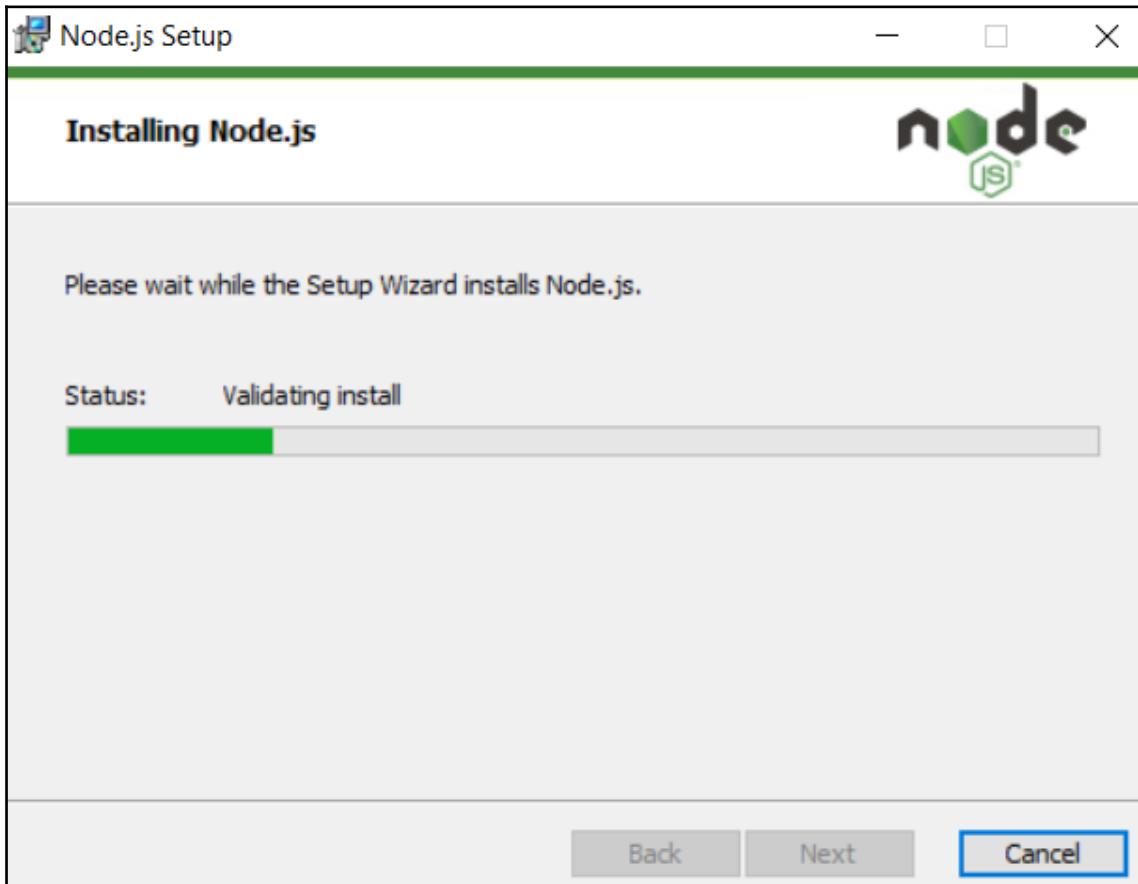
Pretty Raw Preview JSON ▾

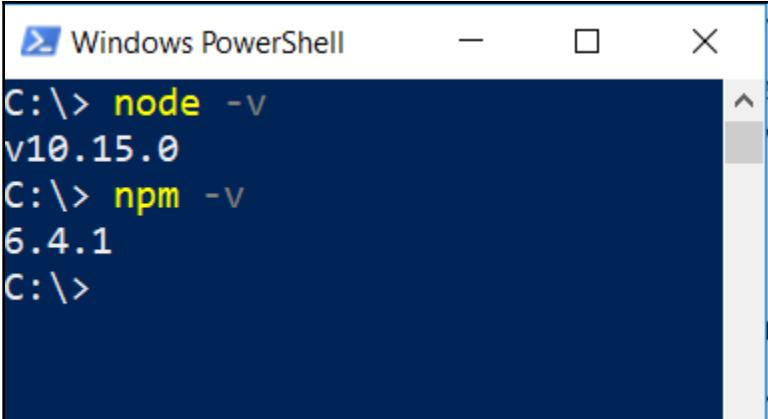
```
1 <!
2   "_embedded": {
3     "cars": [
4       {
5         "brand": "Ford",
6         "model": "Mustang",
7         "color": "Red",
8         "registerNumber": "ADF-1121",
9         "year": 2017,
10        "price": 50000,
11        "_links": {
12          "self": {
13            "href": "http://localhost:8080/api/cars/3"
14          },
15          "car": {
16            "href": "http://localhost:8080/api/cars/3"
17          },
18          "owner": {
19            "href": "http://localhost:8080/api/cars/3/owner"
20          }
21        },
22      },
23    ],
24  }
```





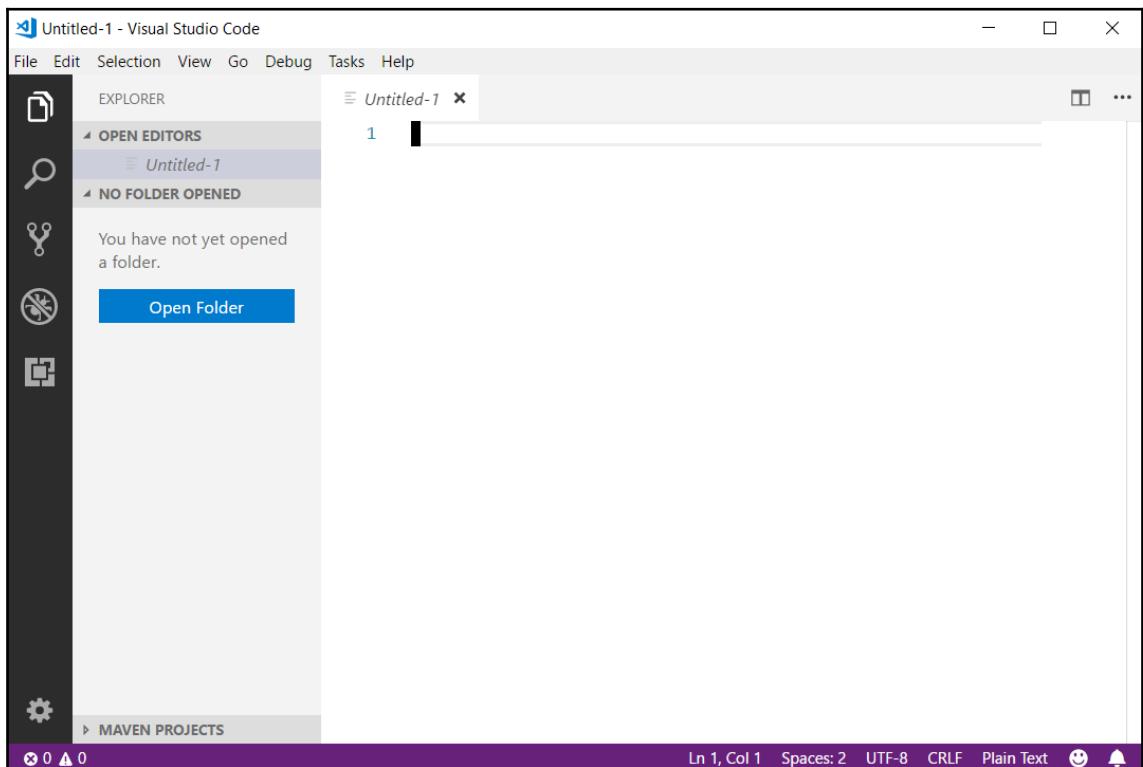
Chapter 6: Setting Up the Environment and Tools - Frontend





```
Windows PowerShell

C:\> node -v
v10.15.0
C:\> npm -v
6.4.1
C:\>
```



Extension: Reactjs code snippets - Visual Studio Code

File Edit Selection View Go Debug Tasks Help

EXTENSIONS: MA.. ...

React.js code snippets

Full React/React Nat... 1.1.2
Code snippets for React/R...
Walter Ribeiro [Install](#)

Angular v5 Snippets 2.16.1
Angular v5 snippets by Joh...
John Papa [Install](#)

React-Native/React/... 1.8.0
Code snippets for React-N...
EQuimper [Install](#)

JavaScript (ES6) cod... 1.6.0
Code snippets for JavaScript...
charalampos karypidis [Install](#)

Code Runner 0.9.3
Run C, C++, Java, JS, PHP, ...
Jun Han [Install](#)

ES7 React/Redux/Gra... 1.5.2
Simple extensions for React...
dsznajder [Install](#)

Angular 6 Snippets... 6.0.14
181 Angular Snippets (Typ...
Mikael Morlund [Install](#)

React Standard Styl... 1.1.0
Code snippets for React de...
Timon van Spronsen [Install](#)

Reactjs code snippets 2.1.0
Code snippets for Reactjs ...
charalampos karypidis [Install](#)

Reactjs code snippets xabikos.reactsnippets
charalampos karypidis | 475,290 | ★★★★★ | Repository
Code snippets for Reactjs development in ES6 syntax
[Disable](#) [Uninstall](#)

[Details](#) [Contributions](#) [Changelog](#) [Dependencies](#)

Reactjs

VS Code Reactjs snippets

Visual Studio Marketplace v2.1.0 installs 475290 rating average: 4.93/5 (15 ratings)

This extension contains code snippets for **Reactjs** and is based on the awesome [babel-sublime-snippets](#) package.

Installation

In order to install an extension you need to launch the Command Pallete (Ctrl + Shift + P or Cmd + Shift + P) and type Extensions. There you have either the option to show the already installed snippets or install new ones.

Supported languages (file extensions)

- JavaScript (.js)
- TypeScript (.ts)

eslint

ESLint 1.8.2
Integrates ESLint JavaScript...
Dirk Baeumer [Install](#)

Disable eslint rule 0.0.2
WoodHead [Install](#)

Richa's ESLint Sni... 0.0.2
Richa Avasthi [Install](#)

Debugger ESLint ... 0.0.3
Pierre Marchal [Install](#)

LintLens — ESLint... 2.3.0
Augment your ESLint ru...
Gabriel McAdams [Install](#)

eslint-disable-sni... 1.2.0
Simple snippets for disa...
Adam Knox [Install](#)

ESLint dbaeumer.vscode-eslint
Dirk Baeumer | 19,094,969 | ★★★★★ | Repository | License
Integrates ESLint JavaScript into VS Code.
[Disable](#) [Uninstall](#)

This extension is recommended based on the files you recently opened. [Ignore Recommendation](#)

[Details](#) [Contributions](#) [Changelog](#)

VS Code ESLint extension

 [Build Status](#)

Integrates **ESLint** into VS Code. If you are new to ESLint check the [documentation](#).

The extension uses the ESLint library installed in the opened workspace folder. If the folder doesn't provide one the extension looks for a global install version. If you haven't installed ESLint either locally or globally do so by running `npm install eslint` in the workspace

prettier

Prettier - Code formatter 1.8.1
VS Code plugin for prettier
Esben Petersen

Prettier Now 1.4.9
VS Code plugin for Prettier
Remi Marsal

Prettier - JavaScript 1.1.0
VS Code plugin for json...
Bastian Kistner

Prettier - Java... 0.17.101
Fork of prettier-vscode: ...
Mathieu SCHRO...

Prettier - JavaSc... 0.22.1
prettier or prettier + sta...
bySabi Files

Prettier - JavaSc... 0.22.1
prettier or prettier + se...
bySabi Files

Prettier Fuge Sta... 0.1.1
prettier with fuge-stand...



Prettier - Code formatter

esbenp.prettier-vscode

Esben Petersen | ⚡ 7,708,910 | ★★★★☆ | Repository | License

VS Code plugin for prettier/prettier

[Disable](#) [Uninstall](#)

[Details](#) [Contributions](#) [Changelog](#)

Prettier formatter for Visual Studio Code

VS Code package to format your JavaScript / TypeScript / CSS using Prettier.

Installation

Install through VS Code extensions. Search for **Prettier - Code formatter**

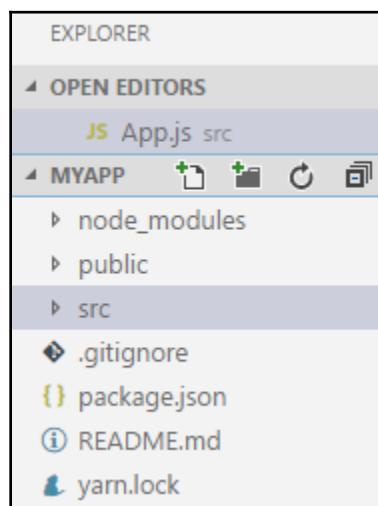
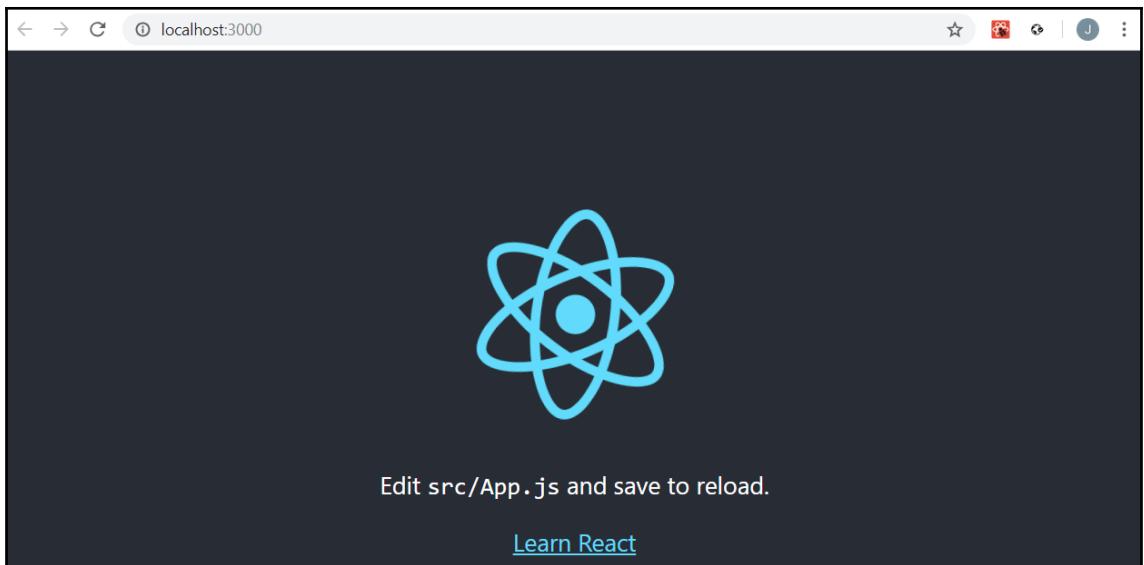
[Visual Studio Code Market Place: Prettier - Code formatter](#)

Can also be installed in VS Code: Launch VS Code Quick Open (Ctrl+P), paste the following command, and press enter.

```
npm
PS C:\> npx create-react-app myapp

Creating a new React app in C:\myapp.

Installing packages. This might take a couple of minutes.
Installing react, react-dom, and react-scripts...
```

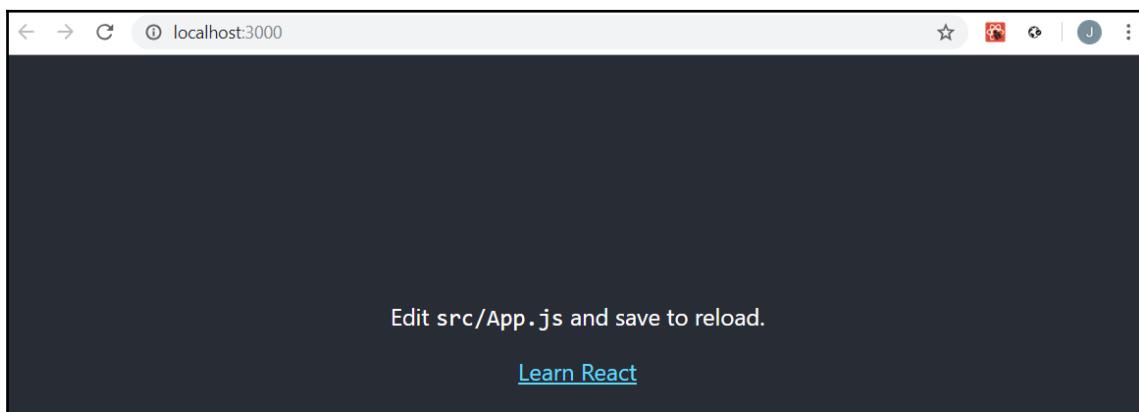


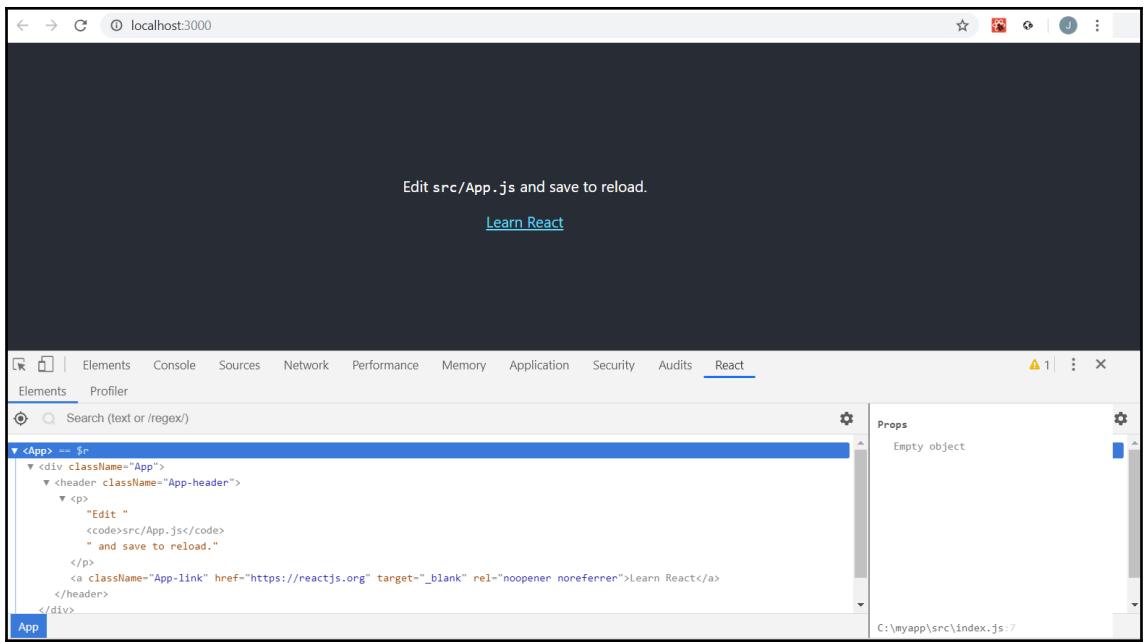
The screenshot shows the Visual Studio Code interface with the following details:

- File Menu:** File, Edit, Selection, View, Go, Debug, Terminal, Help.
- Title Bar:** App.js - myapp - Visual Studio Code.
- Explorer Panel:** Shows the project structure with files like App.js, logo.svg, index.css, etc.
- Editor Panel:** Displays the content of App.js. A specific line of code is highlighted with a blue box:

```
1 import React from 'react';
2 import logo from './logo.svg';
3 import './App.css';
4
5 function App() {
6   return (
7     <div className="App">
8       <header className="App-header">
9         <img src={logo} className="App-logo" alt="logo" />
```

A tooltip appears above the highlighted line: "Edit <code>src/App.js</code> and save to reload."
- Bottom Status Bar:** master, 0 ▲ 0, Live Share, Ln 1, Col 1, Spaces: 2, UTF-8, LF, JavaScript, Prettier, icons for settings, help, and notifications.

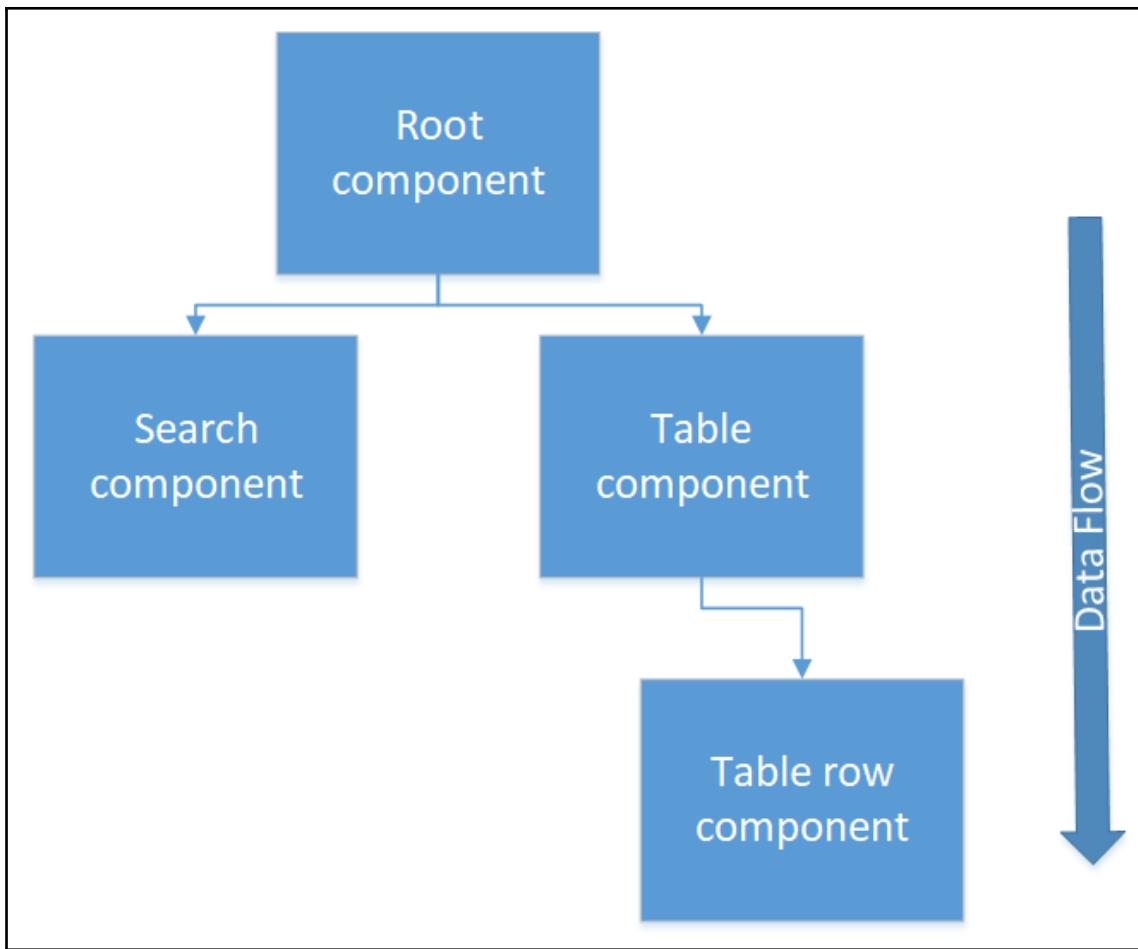




Chapter 7: Getting Started with React

The image shows a user interface for managing tasks. At the top, there is a search bar with a placeholder 'Name' and a 'Search' button. Below the search bar is a table with four columns: 'Id', 'Description', 'Date', and a checkbox column. The table has four rows of data. The first row's checkbox is unselected. The second row's checkbox is selected. The third and fourth rows have radio buttons in their checkbox columns.

▼ Id	▼ Description	▼ Date	
1	Go shopping	1.7.2017	<input type="checkbox"/>
4	Read to exam	23.8.2017	<input checked="" type="checkbox"/>
7	Coffee with Mike	1.9.2017	<input type="radio"/>
10	Wash car	2.9.2017	<input type="radio"/>



The screenshot shows the Babel.js website interface. The top navigation bar includes links for **BABEL**, **Learn ES2015**, **Docs**, **Try it out**, **Blog**, **FAQ**, and **Team**. On the far right are search, donation, and social media links. The main area has a yellow header with "Settings" and a dropdown menu. Below this, there are two code editors. The left editor shows the input code:

```
1 (x, y) => {x + y};
```

 The right editor shows the transformed output code:

```
1 "use strict";
2
3 (function (x, y) {
4   x + y;
5 });
```

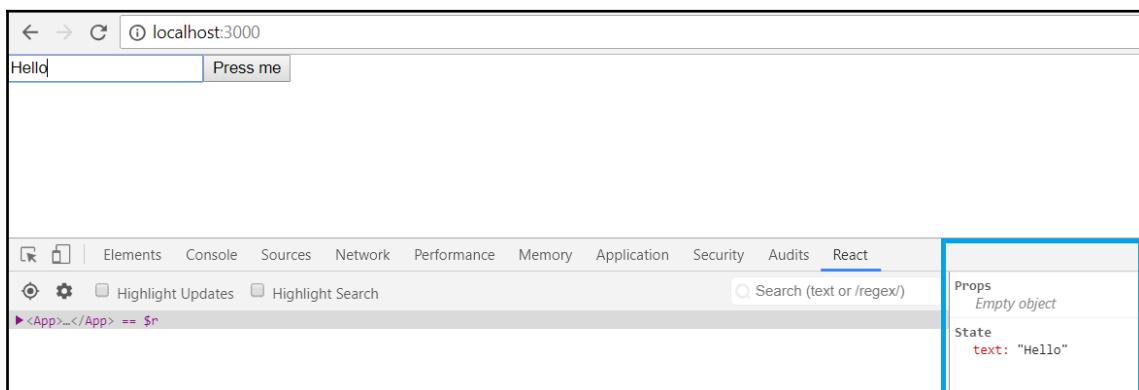
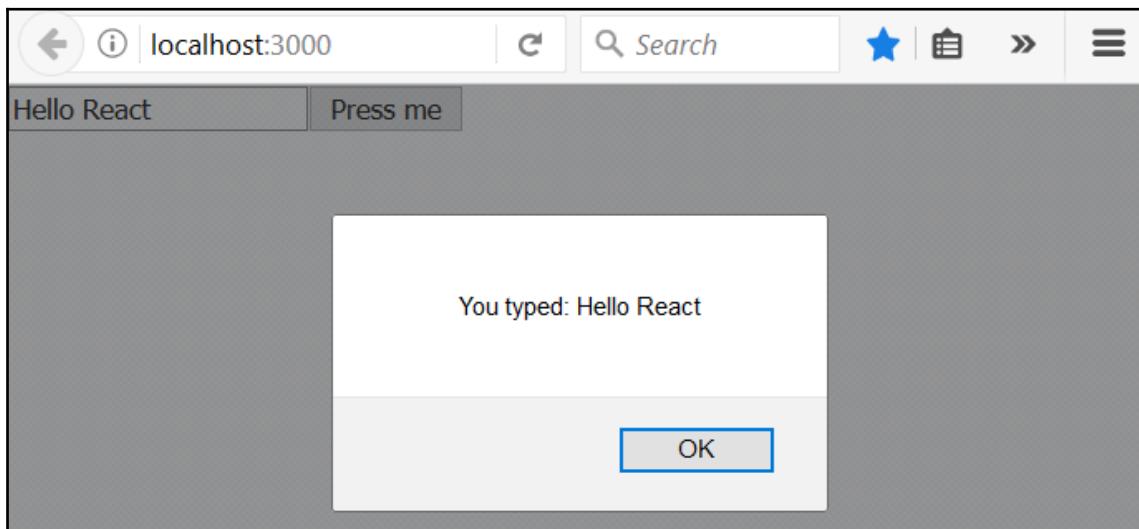
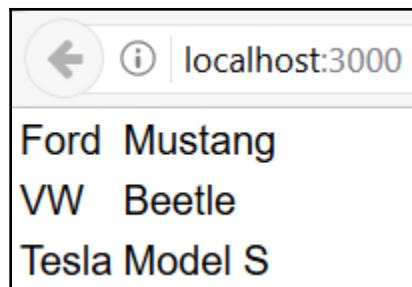
A screenshot of a web browser window. The address bar shows 'localhost:3000'. The main content area displays a digital counter with the number '3' and a button labeled 'Increment'. Below the browser window is the Chrome DevTools interface, specifically the 'Console' tab. The console log shows the following entries:

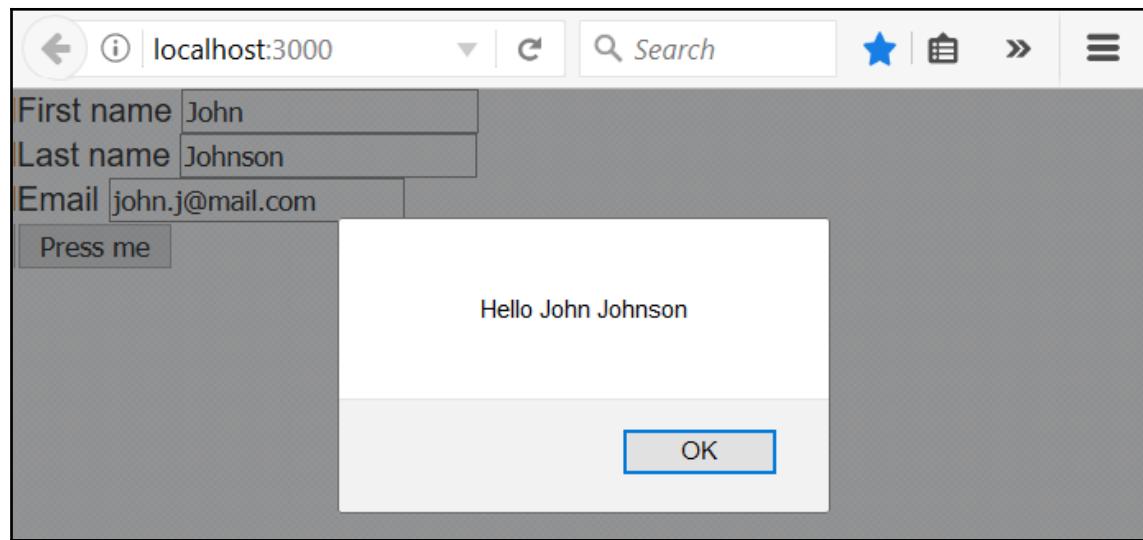
```
count value is 0
Clean up function
count value is 1
Clean up function
count value is 2
Clean up function
count value is 3
```

The right side of each log entry shows the file name and line number: Counter.js:7, Counter.js:9, Counter.js:7, Counter.js:9, Counter.js:7, Counter.js:9, Counter.js:7.

A screenshot of a web browser window. The address bar shows 'localhost:3000'. The main content area displays a list of five list items, each preceded by a bullet point:

- Listitem 1
- Listitem 2
- Listitem 3
- Listitem 4
- Listitem 5





Chapter 8: Consuming the REST API with React

The screenshot shows the OpenWeatherMap API keys management interface. At the top, there's a navigation bar with links for Weather, Maps, API, Price, Partners, Stations, Widgets, News, and About. Below the navigation is a sub-navigation bar with links for Setup, API keys (which is highlighted), My Services, My Payments, Billing plans, Map editor, Block logs, and History bulk. On the far right of this bar is a 'Logout' button. A message box in the center states: "Activation of an API key for **Free** and **Startup** accounts takes **10 minutes**. For **other accounts** it takes from **10 to 60 minutes**. You can generate as many API keys as needed for your subscription. We accumulate the total load from all of them." Below the message box is a table with one row. The first column is labeled 'Key' and contains the value 'c36b03a963176b9a63985'. The second column is labeled 'Name' and contains the value 'Default'. To the right of the table are two small buttons with icons (refresh and delete) and a 'Create key' button. Below the table is a field labeled '* Name' with a dropdown arrow.

The screenshot shows a browser developer tools Network tab with a request to `api.openweathermap.org/data/2.5/weather?q=`. The response is a JSON object representing weather data for a location. The JSON structure includes properties for coordinates, weather conditions, and main atmospheric parameters. Two specific sections are highlighted with blue boxes: the weather description and the main temperature information.

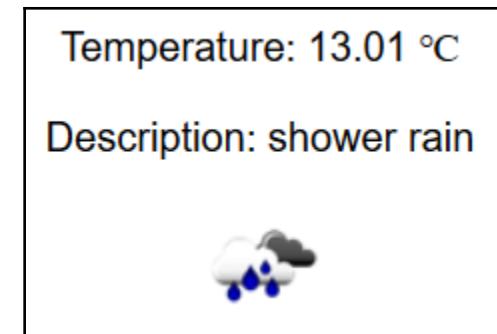
```
{ ▼ 12 properties, 442 bytes
  "coord": { ▼ 2 properties, 25 bytes
    "lon": -0.13,
    "lat": 51.51
  },
  "weather": [ ▼ 1 item, 73 bytes
    { ▼ 4 properties, 71 bytes
      "id": 804,
      "main": "Clouds",
      "description": "overcast clouds",
      "icon": "04d"
    }
  ],
  "base": "stations",
  "main": { ▼ 5 properties, 72 bytes
    "temp": 15.45,
    "pressure": 1014,
    "humidity": 45,
    "temp_min": 14,
    "temp_max": 17
  }
},
```

The screenshot shows a browser developer tools React DevTools panel. It displays the state of a component, which is an object with three properties: `Props`, `Empty object`; `State`, which contains `desc: "moderate rain"`, `icon: "10d"`, and `temp: 12.34`.

Props
Empty object

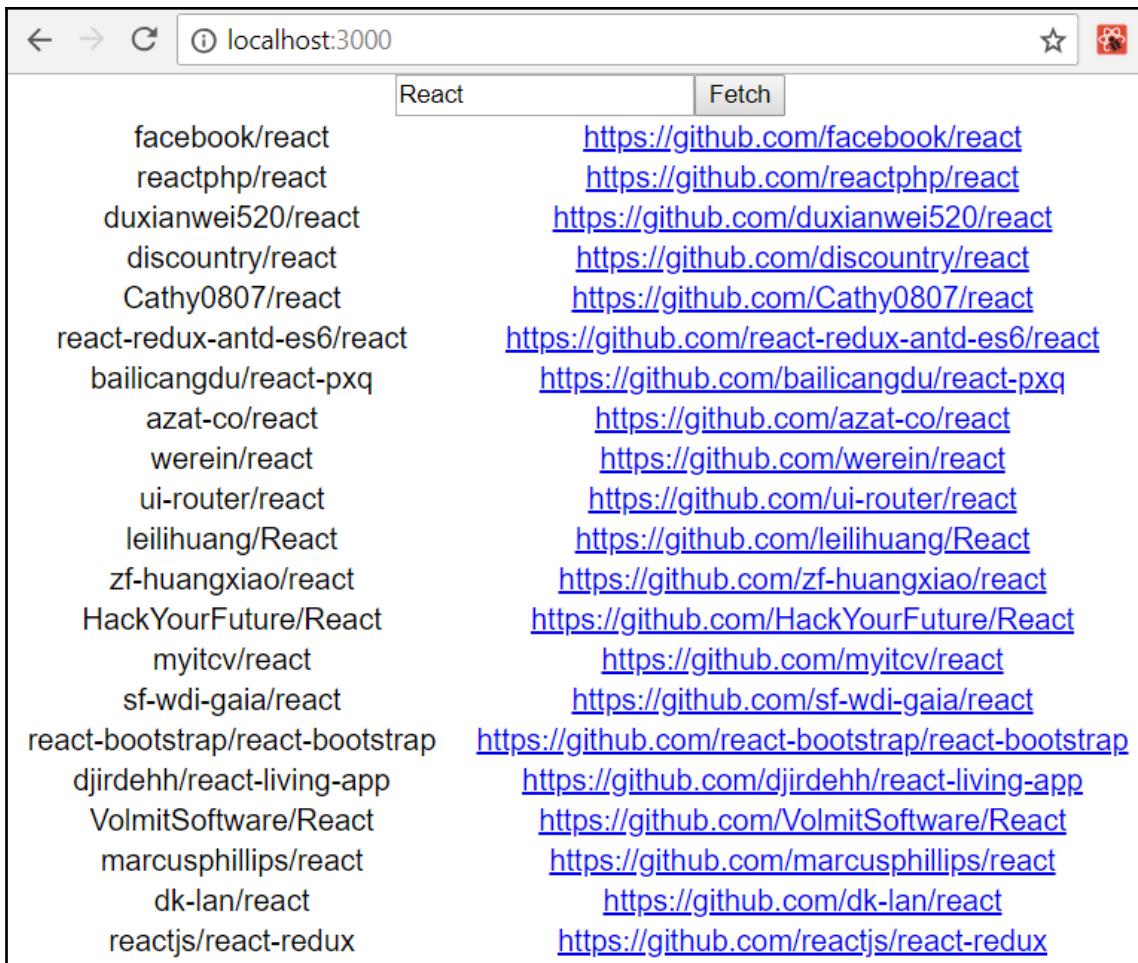
State

```
desc: "moderate rain"
icon: "10d"
temp: 12.34
```



← ⓘ 🔒 | <https://api.github.com/search/repositories?q=react>

```
"items": [ ▼ 30 items, 165 KB
  { ▼ 72 properties, 5 KB
    "id": 10270250,
    "name": "react",
    "full_name": "facebook/react",
    "owner": { ▶ 17 properties, 1 KB "login": "facebook", "id": 69631, "avatar_url": "https://avatars3.githubusercontent.com/u/69631?v=4", "private": false },
    "html_url": "https://github.com/facebook/react",
    "description": "A declarative, efficient, and flexible JavaScript library for building user interfaces.",
    "fork": false,
    "url": "https://api.github.com/repos/facebook/react",
    "forks_url": "https://api.github.com/repos/facebook/react/forks",
    "keys_url": "https://api.github.com/repos/facebook/react/keys{/key_id}",
    "collaborators_url": "https://api.github.com/repos/facebook/react/collaborators{/collaborator}",
    "teams_url": "https://api.github.com/repos/facebook/react/teams",
    "hooks_url": "https://api.github.com/repos/facebook/react/hooks",
    "issue_events_url": "https://api.github.com/repos/facebook/react/issues/events{/number}",
    "events_url": "https://api.github.com/repos/facebook/react/events",
    "assignees_url": "https://api.github.com/repos/facebook/react/assignees{/user}",
    "branches_url": "https://api.github.com/repos/facebook/react/branches{/branch}",
    "tags_url": "https://api.github.com/repos/facebook/react/tags",
    "blobs_url": "https://api.github.com/repos/facebook/react/git/blobs{/sha}",
    "git_tags_url": "https://api.github.com/repos/facebook/react/git/tags{/sha}",
    "git_refs_url": "https://api.github.com/repos/facebook/react/git/refs{/sha}",
    "trees_url": "https://api.github.com/repos/facebook/react/git/trees{/sha}",
    "statuses_url": "https://api.github.com/repos/facebook/react/statuses{/sha}",
    "languages_url": "https://api.github.com/repos/facebook/react/languages",
    "stargazers_url": "https://api.github.com/repos/facebook/react/stargazers",
    "contributors_url": "https://api.github.com/repos/facebook/react/contributors",
    "subscribers_url": "https://api.github.com/repos/facebook/react/subscribers",
    "subscription_url": "https://api.github.com/repos/facebook/react/subscription",
    "commits_url": "https://api.github.com/repos/facebook/react/commits{/sha}",
    "git_commits_url": "https://api.github.com/repos/facebook/react/git/commits{/sha}",
    "comments_url": "https://api.github.com/repos/facebook/react/comments{/number}",
    "issue_comment_url": "https://api.github.com/repos/facebook/react/issues/comments{/number}",
    "contents_url": "https://api.github.com/repos/facebook/react/contents{/+path}"
```



A screenshot of a web browser window displaying a list of GitHub repositories under the 'React' tab. The browser address bar shows 'localhost:3000'. The 'React' tab is selected. The list includes:

Repository	URL
facebook/react	https://github.com/facebook/react
reactphp/react	https://github.com/reactphp/react
duxianwei520/react	https://github.com/duxianwei520/react
discountry/react	https://github.com/discountry/react
Cathy0807/react	https://github.com/Cathy0807/react
react-redux-antd-es6/react	https://github.com/react-redux-antd-es6/react
bailicangdu/react-pxq	https://github.com/bailicangdu/react-pxq
azat-co/react	https://github.com/azat-co/react
werein/react	https://github.com/werein/react
ui-router/react	https://github.com/ui-router/react
leilihuang/React	https://github.com/leilihuang/React
zf-huangxiao/react	https://github.com/zf-huangxiao/react
HackYourFuture/React	https://github.com/HackYourFuture/React
myitcv/react	https://github.com/myitcv/react
sf-wdi-gaia/react	https://github.com/sf-wdi-gaia/react
react-bootstrap/react-bootstrap	https://github.com/react-bootstrap/react-bootstrap
djirdehh/react-living-app	https://github.com/djirdehh/react-living-app
VolmitSoftware/React	https://github.com/VolmitSoftware/React
marcusphillips/react	https://github.com/marcusphillips/react
dk-lan/react	https://github.com/dk-lan/react
reactjs/react-redux	https://github.com/reactjs/react-redux

Chapter 9: Useful Third-Party Components for React

JS.coach

Search: table

All **React** React Native Webpack Babel PostCSS Clear filters

Sort by relevance ▾

fixed-data-table v0.6.5 updated 6 months ago by facebookarchive

A React table component designed to allow presenting thousands of rows of data.

BSD-3-Clause ★ 4k ↓ 93k ⚙ 0 ⚡

react-table v6.8.2 updated 3 weeks ago by react-tools

A fast, lightweight, opinionated table and datagrid built on React.

MIT ★ 4k ↓ 246k ⚙ 0 ⚡

react-bootstrap-table v4.3.1 updated 2 months ago by AllenFang

It's a react table for bootstrap.

MIT ★ 2k ↓ 87k ⚙ 0 ⚡

fixed-data-table-2 v0.8.13 updated 2 days ago by schrodinger

A React table component designed to allow presenting thousands of rows of data.

BSD-3-Clause ★ 671 ↓ 72k ⚙ 0 ⚡

JS.coach



list

All React React Native Webpack Babel PostCSS

Sort by relevance ▾

React Popular

react-tiny-virtual-list v2.1.4 updated 6 months ago by  clauderic

A tiny but mighty list virtualization component, with zero dependencies ⚡

MIT

★ 813

⬇ 31k

📦 0

React Native Popular

react-native-sortable-listview v0.2.8 updated 3 months ago by  deanmcpherson

Drag drop capable wrapper of ListView for React Native.

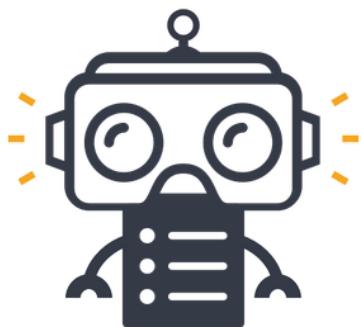
MIT

★ 631

⬇ 5k

📦 0





npm v2.1.4 downloads 31k/month build passing codecov 93% </> TypeScript license MIT chat on gitter

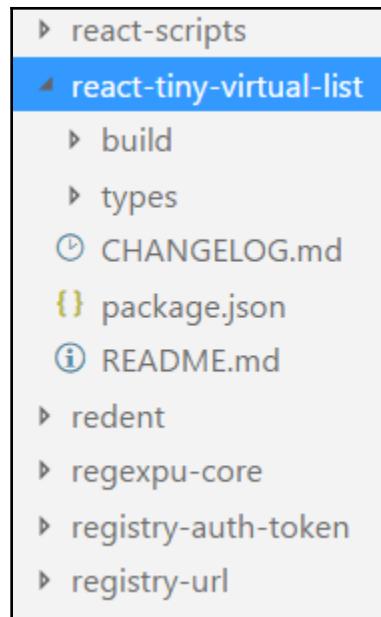
- **Tiny & dependency free** - Only 3kb gzipped
- **Render millions of items**, without breaking a sweat
- **Scroll to index or set the initial scroll offset**
- **Supports fixed or variable heights/widths**
- **Vertical or Horizontal lists**

Check out the [demo](#) for some examples, or take it for a test drive right away in [Code Sandbox](#).

Getting Started

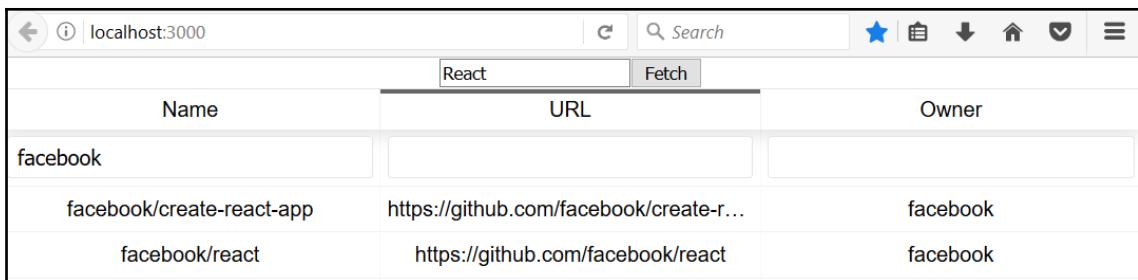
Using [npm](#):

```
npm install react-tiny-virtual-list --save
```

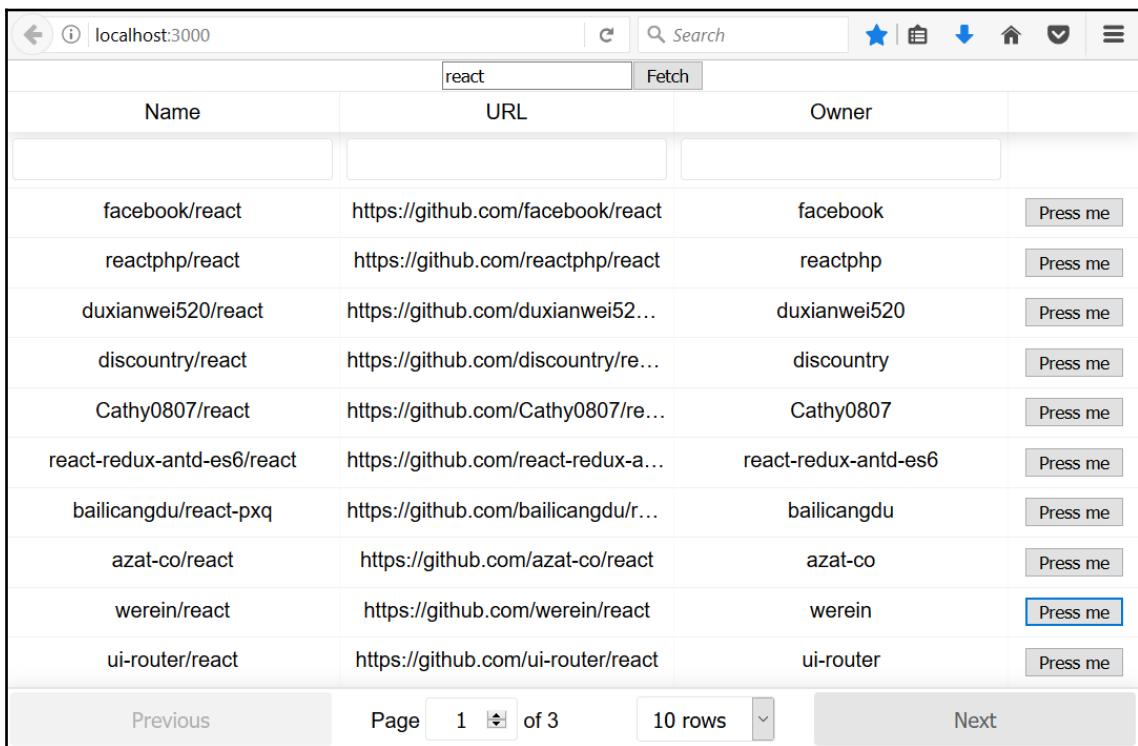


A screenshot of a GitHub search results page. The search term is 'react'. The results table has columns for Name, URL, and Owner. There are 3 pages of results, with 10 rows per page.

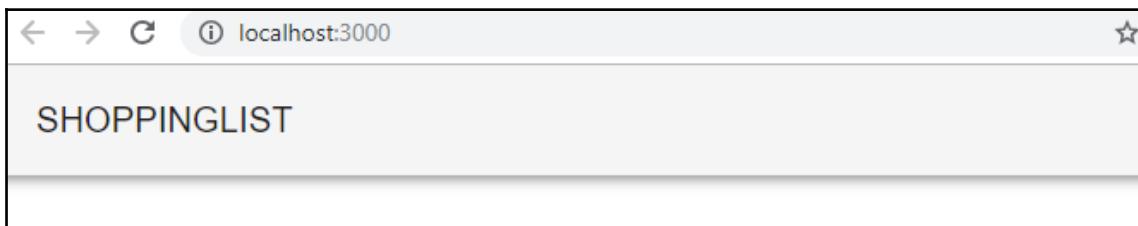
Name	URL	Owner
facebook/react	https://github.com/facebook/react	facebook
reactphp/react	https://github.com/reactphp/react	reactphp
duxianwei520/react	https://github.com/duxianwei520/react	duxianwei520
discountry/react	https://github.com/discountry/react	discountry
Cathy0807/react	https://github.com/Cathy0807/react	Cathy0807
react-redux-antd-es6/react	https://github.com/react-redux-antd-es6/react	react-redux-antd-es6
bailicangdu/react-pxq	https://github.com/bailicangdu/react-pxq	bailicangdu
azat-co/react	https://github.com/azat-co/react	azat-co
werein/react	https://github.com/werein/react	werein
ui-router/react	https://github.com/ui-router/react	ui-router



Name	URL	Owner
facebook		
facebook/create-react-app	https://github.com/facebook/create-r...	facebook
facebook/react	https://github.com/facebook/react	facebook



Name	URL	Owner	
facebook/react	https://github.com/facebook/react	facebook	<button>Press me</button>
reactphp/react	https://github.com/reactphp/react	reactphp	<button>Press me</button>
duxianwei520/react	https://github.com/duxianwei52...	duxianwei520	<button>Press me</button>
discountry/react	https://github.com/discountry/re...	discountry	<button>Press me</button>
Cathy0807/react	https://github.com/Cathy0807/re...	Cathy0807	<button>Press me</button>
react-redux-antd-es6/react	https://github.com/react-redux-a...	react-redux-antd-es6	<button>Press me</button>
bailicangdu/react-pxq	https://github.com/bailicangdu/r...	bailicangdu	<button>Press me</button>
azat-co/react	https://github.com/azat-co/react	azat-co	<button>Press me</button>
werein/react	https://github.com/werein/react	werein	<button>Press me</button>
ui-router/react	https://github.com/ui-router/react	ui-router	<button>Press me</button>



SHOPPINGLIST

← → ⌛ ⓘ localhost:3000 ⭐ 🚙 🔍 🚨 🌐 ⋮

SHOPPINGLIST

ADD ITEM

New Item

Product
Potatoes

Amount
1 kg

CANCEL **ADD**

← → ⌛ ⓘ localhost:3000 ⭐ 🌐 ⋮

SHOPPINGLIST

ADD ITEM

Eggs
12 pcs

Potatoes
1 kg

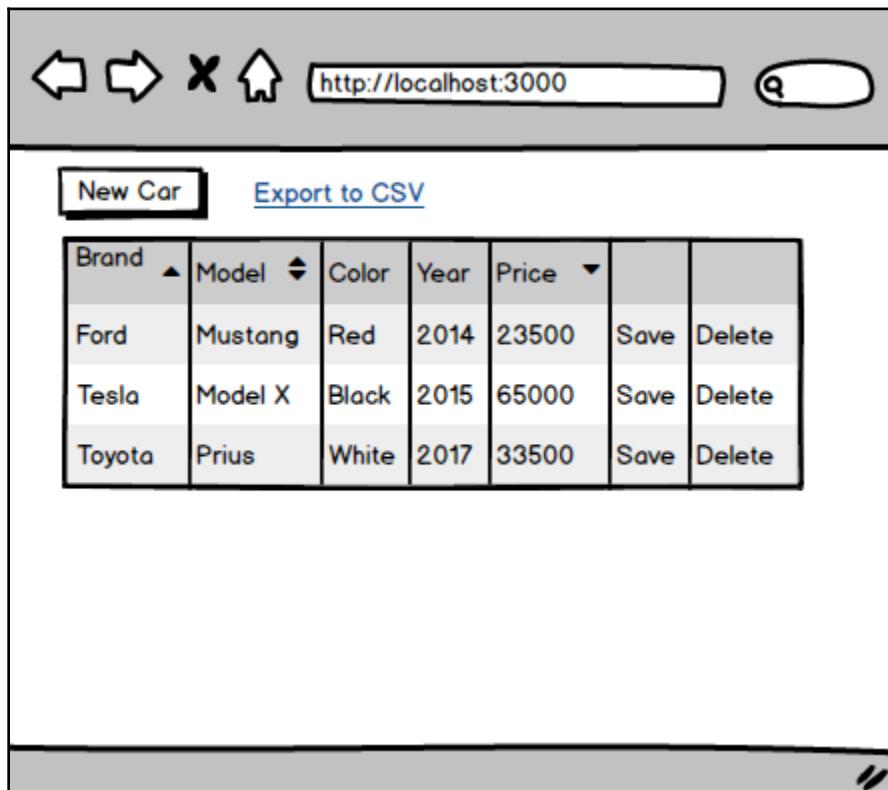
[Home](#) [Contact](#) [Links](#)

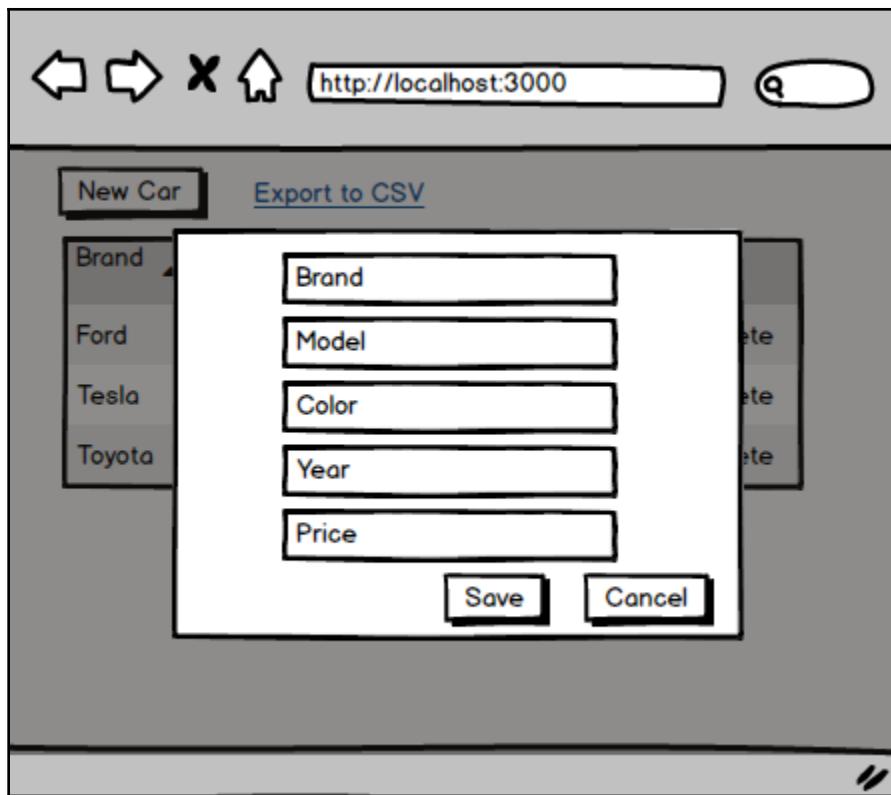
Home.js

[Home](#) [Contact](#) [Links](#)

Contact.js

Chapter 10: Setting Up the Frontend for Our Spring Boot RESTful Web Service

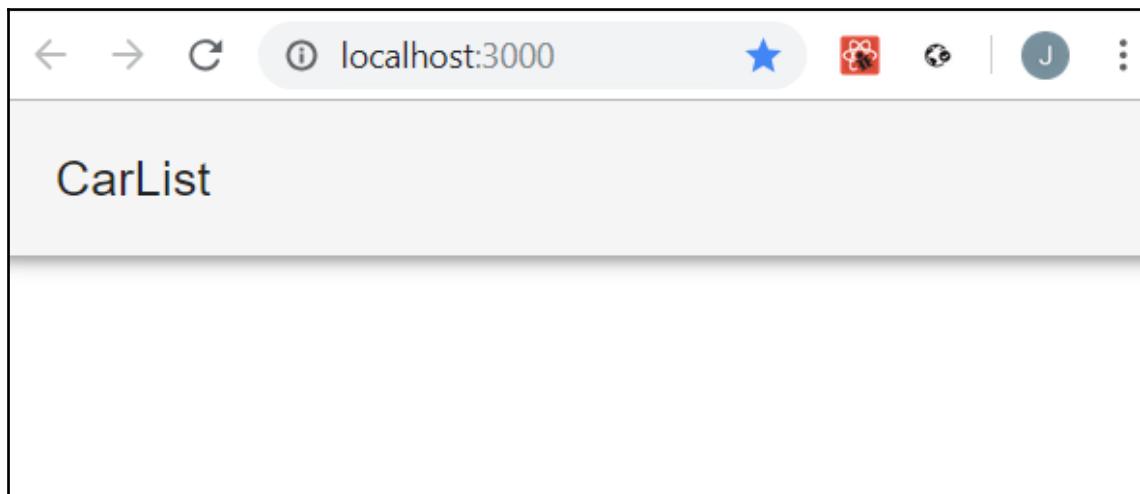




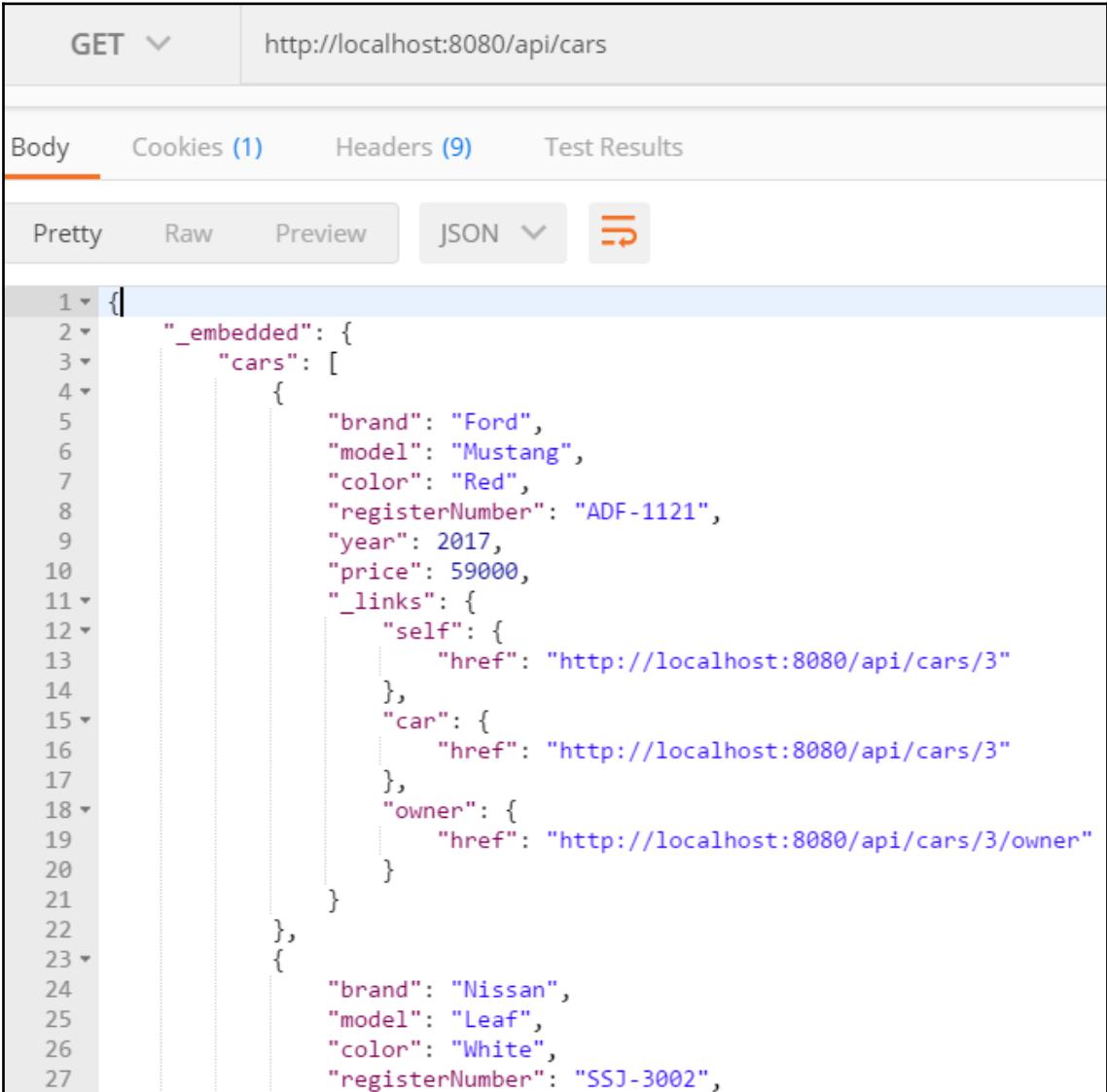
GET ▼ http://localhost:8080/api/cars Params Send Save

Pretty Raw Preview JSON ▾

```
1  {
2   "_embedded": {
3     "cars": [
4       {
5         "brand": "Ford",
6         "model": "Mustang",
7         "color": "Red",
8         "registerNumber": "ADF-1121",
9         "year": 2017,
10        "price": 59000,
11        "_links": {
12          "self": {
13            "href": "http://localhost:8080/api/cars/3"
14          },
15          "car": {
16            "href": "http://localhost:8080/api/cars/3"
17          },
18          "owner": {
19            "href": "http://localhost:8080/api/cars/3/owner"
20          }
21        },
22      },
23      {
24        "brand": "Nissan",
25        "model": "Leaf",
26        "color": "White",
27        "registerNumber": "SSJ-3002",
28        "year": 2014,
29        "price": 30000
30      }
31    ]
32  }
33 }
```



Chapter 11: Adding CRUD Functionalities

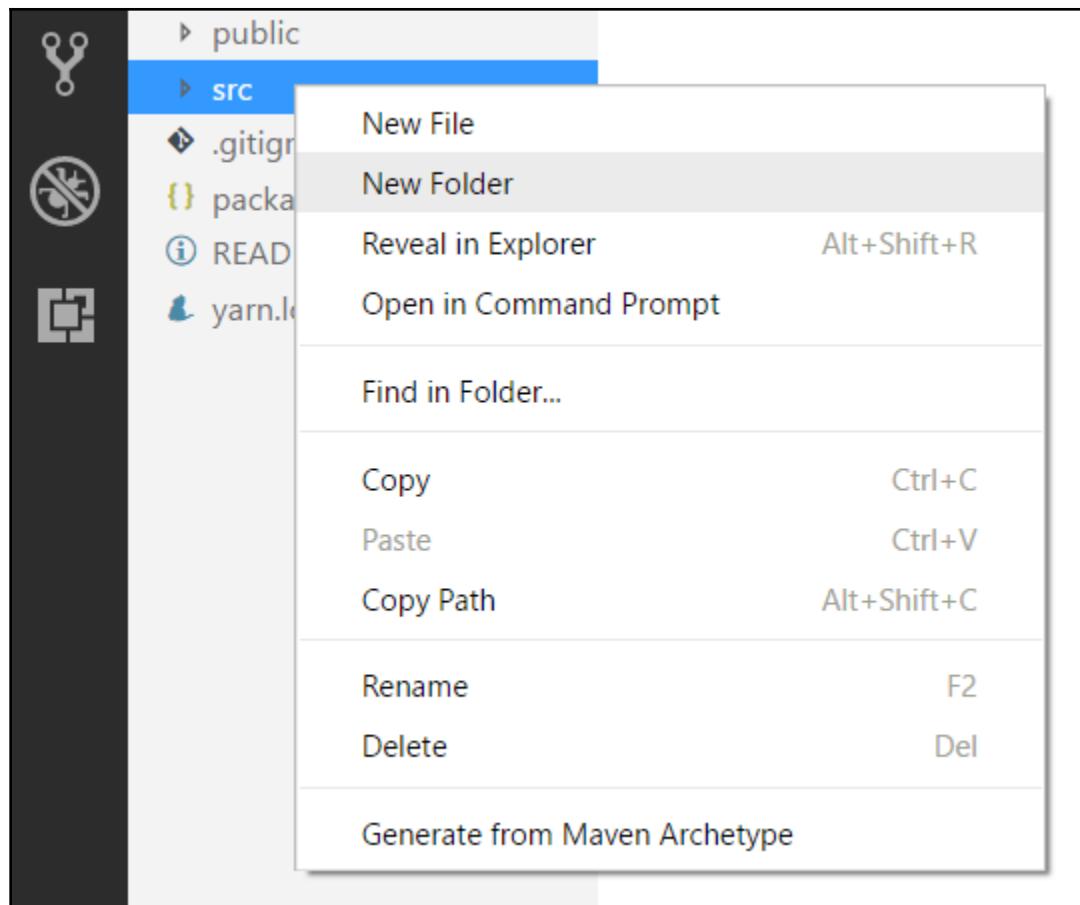


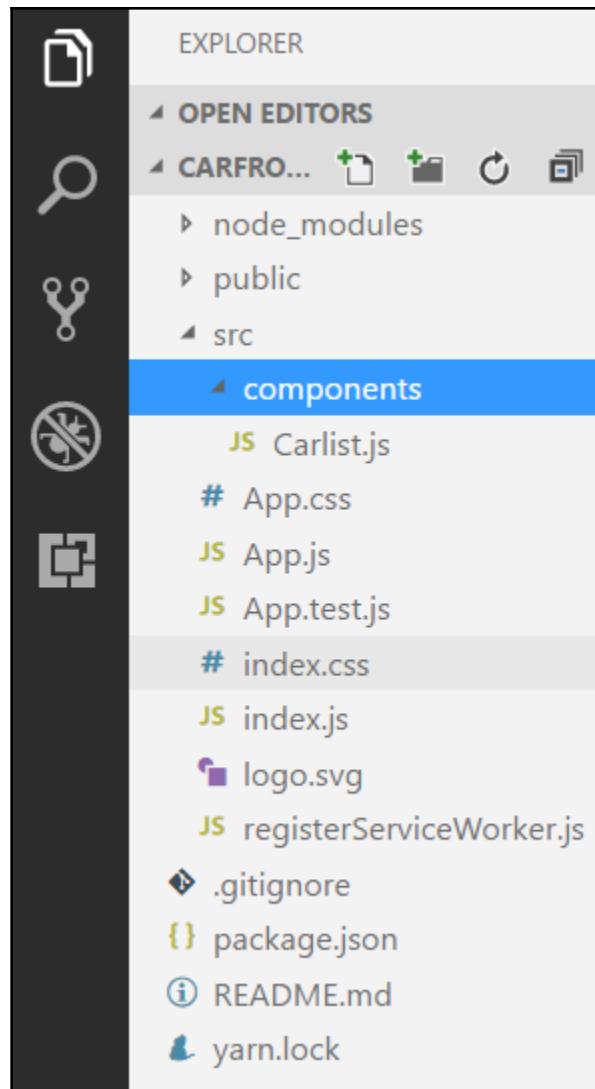
GET <http://localhost:8080/api/cars>

Body Cookies (1) Headers (9) Test Results

Pretty Raw Preview JSON

```
1  []
2  " _embedded": {
3  " cars": [
4  {
5  "brand": "Ford",
6  "model": "Mustang",
7  "color": "Red",
8  "registerNumber": "ADF-1121",
9  "year": 2017,
10 "price": 59000,
11 " _links": {
12 "self": {
13 "href": "http://localhost:8080/api/cars/3"
14 },
15 "car": {
16 "href": "http://localhost:8080/api/cars/3"
17 },
18 "owner": {
19 "href": "http://localhost:8080/api/cars/3/owner"
20 }
21 }
22 },
23 {
24 "brand": "Nissan",
25 "model": "Leaf",
26 "color": "White",
27 "registerNumber": "SSJ-3002",
```





A screenshot of a web browser window titled "CarList". The address bar shows "localhost:3000". The page content displays a list of three cars:

Brand	Model	Color	Year	Price
Ford	Mustang	Red	2017	59000
Nissan	Leaf	White	2014	29000
Toyota	Prius	Silver	2018	39000

A screenshot of a web browser window titled "CarList". The address bar shows "localhost:3000". The page content displays the same car data in a tabular format:

Brand	Model	Color	Year	Price €
Ford	Mustang	Red	2017	59000
Nissan	Leaf	White	2014	29000
Toyota	Prius	Silver	2018	39000

GET ▼ http://localhost:8080/api/cars

Body Cookies (1) Headers (9) Test Results

Pretty Raw Preview JSON ▾

```
1  {}
2  " _embedded": {
3  " cars": [
4  {
5  "brand": "Ford",
6  "model": "Mustang",
7  "color": "Red",
8  "registerNumber": "ADF-1121",
9  "year": 2017,
10 "price": 59000
11 },
12 " _links": {
13 " self": {
14 " href": "http://localhost:8080/api/cars/3"
15 },
16 " car": {
17 " href": "http://localhost:8080/api/cars/3"
18 },
19 " owner": {
20 " href": "http://localhost:8080/api/cars/3/owner"
21 }
22 },
23 {
24 "brand": "Nissan",
25 "model": "Leaf",
26 "color": "White",
27 "registerNumber": "SSJ-3002",
```

localhost:3000

CarList

Brand	Model	Color	Year	Price €	
					<button>Delete</button>
Ford	Mustang	Red	2017	59000	<button>Delete</button>
Nissan	Leaf	White	2014	29000	<button>Delete</button>
Toyota	Prius	Silver	2018	39000	<button>Delete</button>

localhost:3000

CarList

Brand	Model	Color	Year	Price €	
					<button>Delete</button>
Nissan	Leaf	White	2014	29000	<button>Delete</button>
Toyota	Prius	Silver	2018	39000	<button>Delete</button>

Car deleted

localhost:3000

CarList

Brand	Model	Color	Year	Price €	
Nissan	Leaf	White	2014	29000	<button>Delete</button>

localhost:3000 says
Are you sure to delete?

OK Cancel

localhost:3000

CarList

New Car

Brand	Model	Color	Year	Price €	
Ford	Mustang	Red	2017	59000	<button>Delete</button>
Nissan	Leaf	White	2014	29000	<button>Delete</button>
Toyota	Prius	Silver	2018	39000	<button>Delete</button>

localhost:3000

CarList

New Car

Brand	Model	Color	Year	Price €	
Ford	Mustang		2017	59000	<button>Delete</button>
Nissan	Leaf		2014	29000	<button>Delete</button>
Toyota	Prius		2018	39000	<button>Delete</button>

New car

Volkswagen
Beetle
Green
2019
23000

Cancel Save

localhost:3000

CarList

New Car

Brand	Model	Color	Year	Price €	
Ford	Mustang	Red	2017	59000	<button>Delete</button>
Nissan	Leaf	White	2014	29000	<button>Delete</button>
Toyota	Prius	Silver	2018	39000	<button>Delete</button>
Volkswagen	Beetle	Green	2019	23000	<button>Delete</button>

localhost:3000

CarList

Brand	Model	Color	Year	Price €		
Ford	Mustang	Red	2017	59000	<button>Edit</button>	<button>Delete</button>
Nissan	Leaf	White	2017	29000	<button>Edit</button>	<button>Delete</button>
Toyota	Prius	Silver	2017	39000	<button>Edit</button>	<button>Delete</button>

New Car

Edit car

Ford
Mustang
Red
2017
59000

Cancel Save

← → ⌂ ⓘ localhost:3000

CarList

New Car

Export CSV

generatedBy_react-csv (5).csv - Excel

	brand	model	color	registerNu	year	price	_links
1	Ford	Mustang	Red	ADF-1121	2017	59000	[object Object]
2	Nissan	Leaf	White	SSJ-3002	2014	29000	[object Object]
3	Toyota	Prius	Silver	KKO-0212	2018	39000	[object Object]
4							
5							
6							
7							
8							
9							
10							
11							

generatedBy_react-csv (5)

Ready

100 %

Chapter 12: Styling the Frontend with React Material-UI

[NEW CAR](#)
[Export CSV](#)

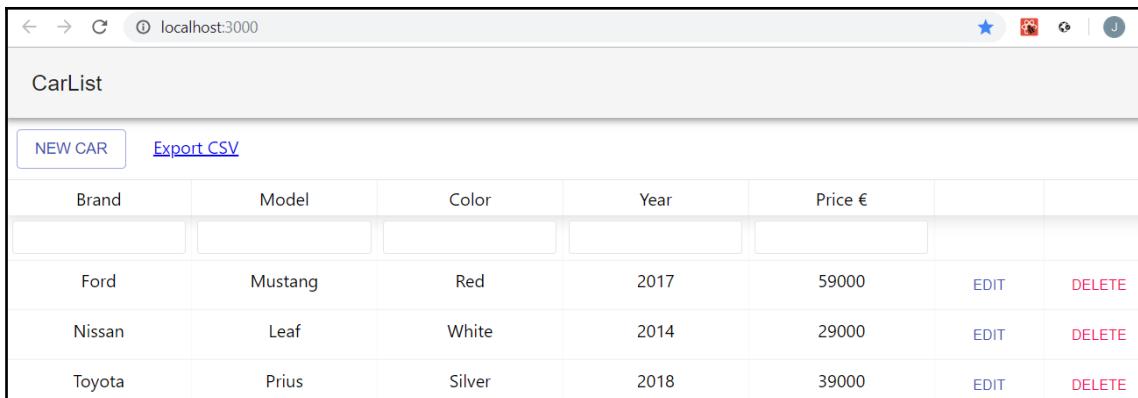
Color

Year

New car

[CANCEL](#) [SAVE](#)

Brand	Model	Color	Year	Price €		
Ford	Mustang	Red	2017	59000	EDIT	DELETE
Nissan	Leaf	White	2014	29000	EDIT	DELETE
Toyota	Prius	Silver	2018	39000	EDIT	DELETE



A screenshot of a web browser window titled "CarList" at "localhost:3000". The page contains a table with columns: Brand, Model, Color, Year, Price €, EDIT, and DELETE. There are four rows of data:

Brand	Model	Color	Year	Price €		
Ford	Mustang	Red	2017	59000	EDIT	DELETE
Nissan	Leaf	White	2014	29000	EDIT	DELETE
Toyota	Prius	Silver	2018	39000	EDIT	DELETE

Buttons: NEW CAR, Export CSV.

New car

Brand
Tesla

Model
Model S

Color
Red

Year
2019

Price
85000

[CANCEL](#) [SAVE](#)

Chapter 13: Testing Your Frontend

```
► node_modules
► public
▲ src
  ▲ components
    JS AddCar.js      U
    JS Carlist.js     U
    JS EditCar.js     U
  # App.css
  JS App.js          M
  JS App.test.js
  JS constants.js    U
  # index.css
  JS index.js
  logo.svg
  JS serviceWorker.js
```

```
PASS  src\App.test.js
✓ renders without crashing (156ms)

Test Suites: 1 passed, 1 total
Tests:       1 passed, 1 total
Snapshots:   0 total
Time:        3.623s
Ran all test suites related to changed files.
```

```
PASS  src/App.test.jstal
✓ renders without crashing (208ms)
✓ renders a snapshot (30ms)

> 1 snapshot written.
Snapshot Summary
> 1 snapshot written from 1 test suite.

Test Suites: 1 passed, 1 total
Tests:       2 passed, 2 total
Snapshots:   1 written, 1 total
Time:        5.548s
```

▲	src	●
▲	_snapshots_	●
≡	App.test.js.snap	U
▲	components	●
JS	AddCar.js	U
JS	Carlist.js	U
JS	EditCar.js	U
#	App.css	
JS	App.js	M
JS	App.test.js	M
JS	constants.js	U

PASS src\AddCar.test.js

Test Suites: 2 passed, 2 total
Tests: 3 passed, 3 total
Snapshots: 1 passed, 1 total
Time: 6.212s
Ran all test suites.

Chapter 14: Securing Your Application

The screenshot shows a browser window with the URL `localhost:3000`. The page title is "CarList". Below the title are two buttons: "NEW CAR" and "Export CSV". A table with columns "Brand", "Model", "Color", and "Year" is partially visible. At the bottom of the page is a navigation bar with links: Elements, Console, Sources, Network, Performance, Memory, Application, Security, Audits, and React. The Network tab is selected. The "View" dropdown shows "Group by frame", "Preserve log", "Disable cache", and "Offline/Online" options. The "Filter" section includes a "Hide data URLs" checkbox and buttons for All, XHR, JS, CSS, Img, Media, Font, Doc, WS, Manifest, and Other. Below the filter is a timeline from 100 ms to 800 ms with several colored bars representing network requests. The main content area displays a list of requests under the "Timing" tab. The first request listed is for `/api/cars`, which has failed with a status code of 403. The details for this request are expanded:

- Request URL:** `http://localhost:8080/api/cars`
- Request Method:** GET
- Status Code:** 403
- Remote Address:** [::1]:8080
- Referrer Policy:** no-referrer-when-downgrade

Below the expanded details, it says "9 requests | 5.7 KB transferred...".

▲	src	●
▲	__snapshots__	●
≡	App.test.js.snap	U
▲	components	●
JS	AddCar.js	U
JS	Carlist.js	U
JS	EditCar.js	U
JS	Login.js	U
JS	AddCar.test.js	U
#	App.css	
JS	App.js	M
JS	App.test.js	M
JS	constants.js	U
#	index.css	
JS	index.js	
📁	logo.svg	
JS	serviceWorker.js	
⚙️	.eslintrc.json	U
⚡	.gitignore	
{}	package.json	M
ⓘ	README.md	

localhost:3000

CarList

Username

Password

LOGIN

localhost:3000

CarList

[NEW CAR](#) [Export CSV](#)

Brand	Model	Color	Year	Price €

Application

- Manifest
- Service Workers
- Clear storage

Storage

- Local Storage
- Session Storage

jwt

```
Bearer eyJhbGciOiJIUzI1NiJ9.eyJzdWIiOijhZG1pbmJlMjczM30..ob8hT9SUSJ_GdgxkWASmpsEnvy-OxLU6Kthzd7THmuC3K5ee1Rp58-xFSOfbx8cNFQ4HaadqPLiCB1SzI9VyQ
```

1 Bearer eyJhbGciOiJIUzI1NiJ9.eyJzdWIiOijhZG1pbmJlMjczM30..ob8hT9SUSJ_GdgxkWASmpsEnvy-OxLU6Kthzd7THmuC3K5ee1Rp58-xFSOfbx8cNFQ4HaadqPLiCB1SzI9VyQ

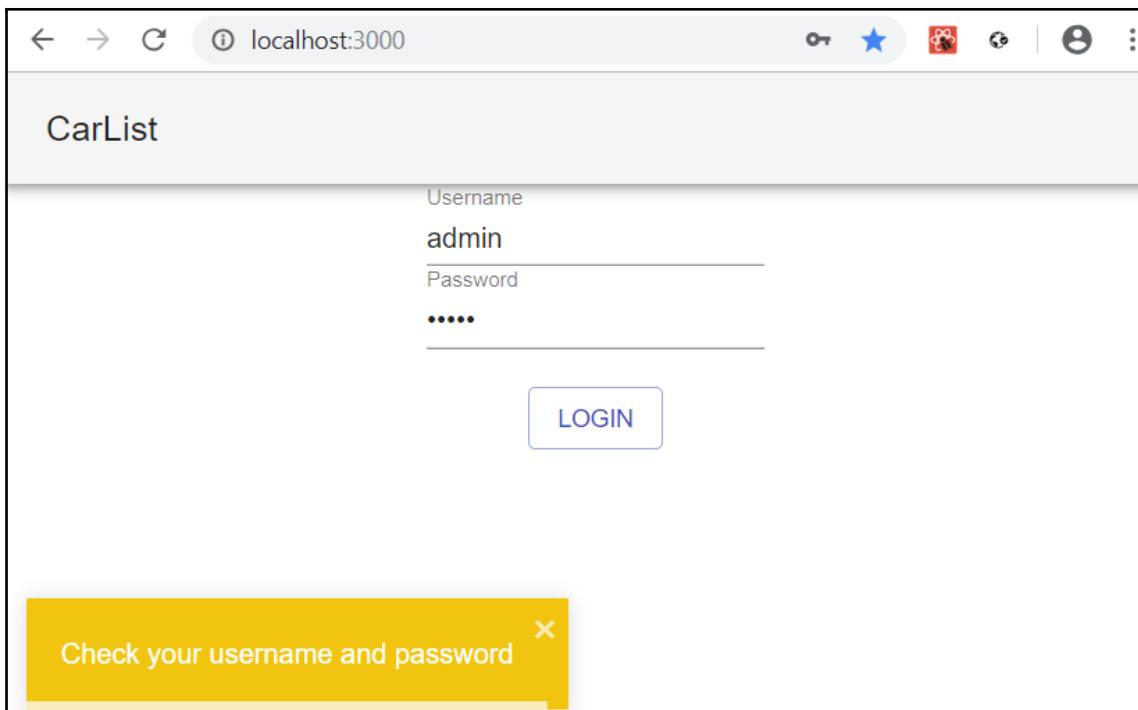
localhost:3000

CarList

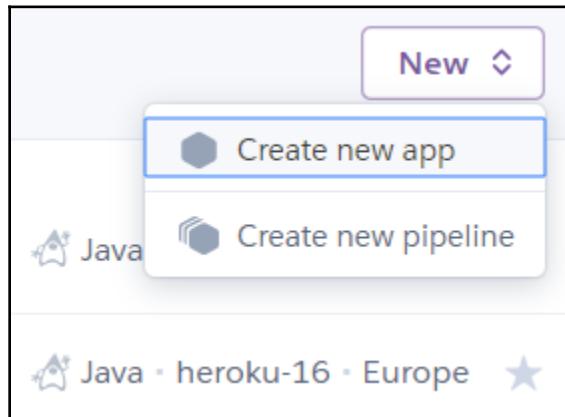
[NEW CAR](#) [Export CSV](#)

Brand	Model	Color	Year	Price €		
Ford	Mustang	Red	2017	59000	EDIT	DELETE
Nissan	Leaf	White	2014	29000	EDIT	DELETE
Toyota	Prius	Silver	2018	39000	EDIT	DELETE

Headers	Cookies	Params	Response	Timings	Stack Trace
Request URL: http://localhost:8080/api/cars					
Request method: GET					
Remote address: 127.0.0.1:8080					
Status code:	● 200	?	Edit and Resend	Raw headers	
Version: HTTP/1.1					
<input type="checkbox"/> Filter headers					
▼ Request headers (40+ D)					
<ul style="list-style-type: none">② Accept: */*② Accept-Encoding: gzip, deflate② Accept-Language: en-US,en;q=0.5② authorization: Bearer eyJhbGciOiJIUzUxMiJ9eyJ...oO4Thw4dqw25B8LDUCG5aLNUJGdDQ② Connection: keep-alive② Host: localhost:8080② origin: http://localhost:3000② Referer: http://localhost:3000/② User-Agent: Mozilla/5.0 (Windows NT 10.0; ...) Gecko/20100101 Firefox/60.0					



Chapter 15: Deploying Your Application



Create New App

App name

✓

carbackend is available

Choose a region

 Europe ▼

 Add to pipeline...

Create app

Deployment method

 Heroku Git
Use Heroku CLI

 GitHub
Connect to GitHub

 Dropbox
Connect to Dropbox

 Container Registry
Use Heroku CLI

Deploy using Heroku Git

Use git in the command line or a GUI tool to deploy this app.

Install the Heroku CLI

Download and install the Heroku CLI.

If you haven't already, log in to your Heroku account and follow the prompts to create a new SSH public key.

```
$ heroku login
```

Create a new Git repository

Initialize a git repository in a new or existing directory

```
$ cd my-project/  
$ git init  
$ heroku git:remote -a carbackend
```

Connect to GitHub

Connect this app to GitHub to enable code diffs and deploys.

Search for a repository to connect to

 juhahinkula **Search**

Missing a GitHub organization? [Ensure Heroku Dashboard has team access.](#)

 juhahinkula/carBackEnd **Connect**

Automatic deploys

Enables a chosen branch to be automatically deployed to this app.

Enable automatic deploys from GitHub

Every push to the branch you specify here will deploy a new version of this app. **Deploys happen automatically:** be sure that this branch is always in a deployable state and any tests have passed before you push. [Learn more.](#)

 master Wait for CI to pass before deploy
Only enable this option if you have a Continuous Integration service configured on your repo.

Enable Automatic Deploys

Manual deploy

Deploy the current state of a branch to this app.

Deploy a GitHub branch

This will deploy the current state of the branch you specify below. [Learn more.](#)

 master **Deploy Branch**

Deploy a GitHub branch

This will deploy the current state of the branch you specify below. [Learn more.](#)

master

Deploy Branch

Receive code from GitHub



Build master [Hide build log](#)



```
[INFO] -----  
----> Discovering process types  
      Procfile declares types     -> (none)  
      Default types for buildpack -> web  
----> Compressing...  
      Done: 77.9M  
----> Launching...  
      Released v3  
      https://carbackend.herokuapp.com/ deployed to Heroku
```

Build finished

[View build log](#)

Release phase



Deploy to Heroku



Your app was successfully deployed.

Overview Resources Deploy Metrics Activity Access Settings

Free Dynos [Upgrade to Hobby...](#)

Web Dyno Autoscaling: Available now for Performance web dynos and Private Spaces. [Hide](#) [Learn More](#)

web java -Dserver.port=\$PORT \$JAVA_OPTS -jar target/cardatabase-0.0.1-SNAPSHOT.jar \$0.00

Add-ons [Find more add-ons](#)

JawsDB

JawsDB MySQL

JawsDB Maria

Connection Info

Connection String

```
mysql://bdcpogfahcyf6fjb:ke68n28w6ka6ttvo@n7qmaptgs6baip9z.chr7pe7iynqr.eu-west-1.rds.amazonaws.com:3306/ebp6gq2544v5gcpc
```

You can use your connection information to connect manually through a client such as [HeidiSQL](#) to administer your database.

Property	Value
Host	n7qmaptgs6baip9z.chr7pe7iynqr.eu-west-1.rds.amazonaws.com
Username	bdcpogf
Password	ke68n28
Port	3306
Database	ebp6gq2544v5gcpc

POST https://carbackend.herokuapp.com/login Params

Authorization Headers **Body** Pre-request Script Tests

form-data x-www-form-urlencoded raw binary **Text**

```
1 {"username": "admin", "password": "admin"}
```

Body Cookies (1) Headers (14) Test Results Status: 200 OK Time: 320 ms

Access-Control-Expose-Headers → Authorization

Authorization → Bearer eyJhbGciOiJIUzUxMiJ9eyJzdWlOiJhZG1pbilsImV4cCl6MTUyNzQxODcxOX0.rX7wvSb1KfV54-KBkLiMN0X1jY_aG4vtBKWCkohXB5TfkbsuPaGmi8Ww6s_NpXr5R0Z8vi0P4pTs5aUJHud2A

Cache-Control → no-cache, no-store, max-age=0, must-revalidate

Connection → keep-alive

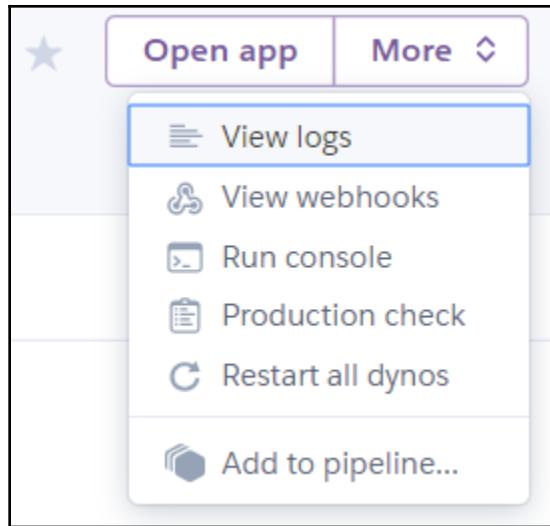
Content-Length → 0

File Edit Search Tools Go to Help 

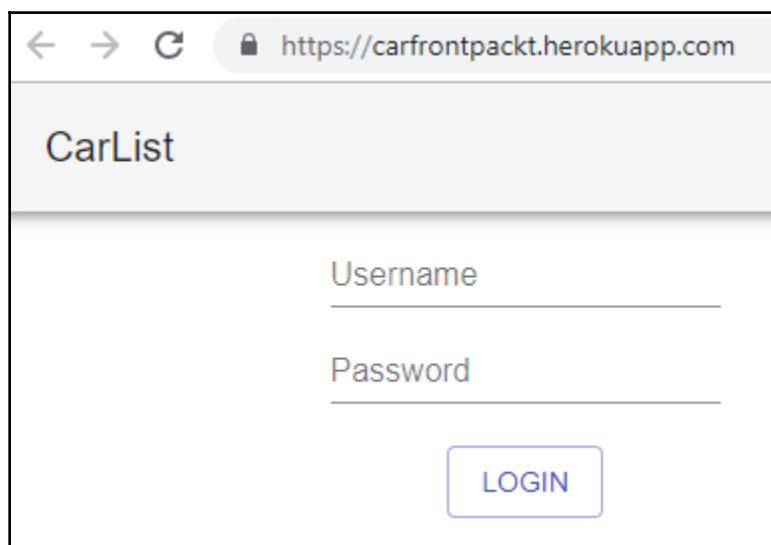
Database filter Table filter 

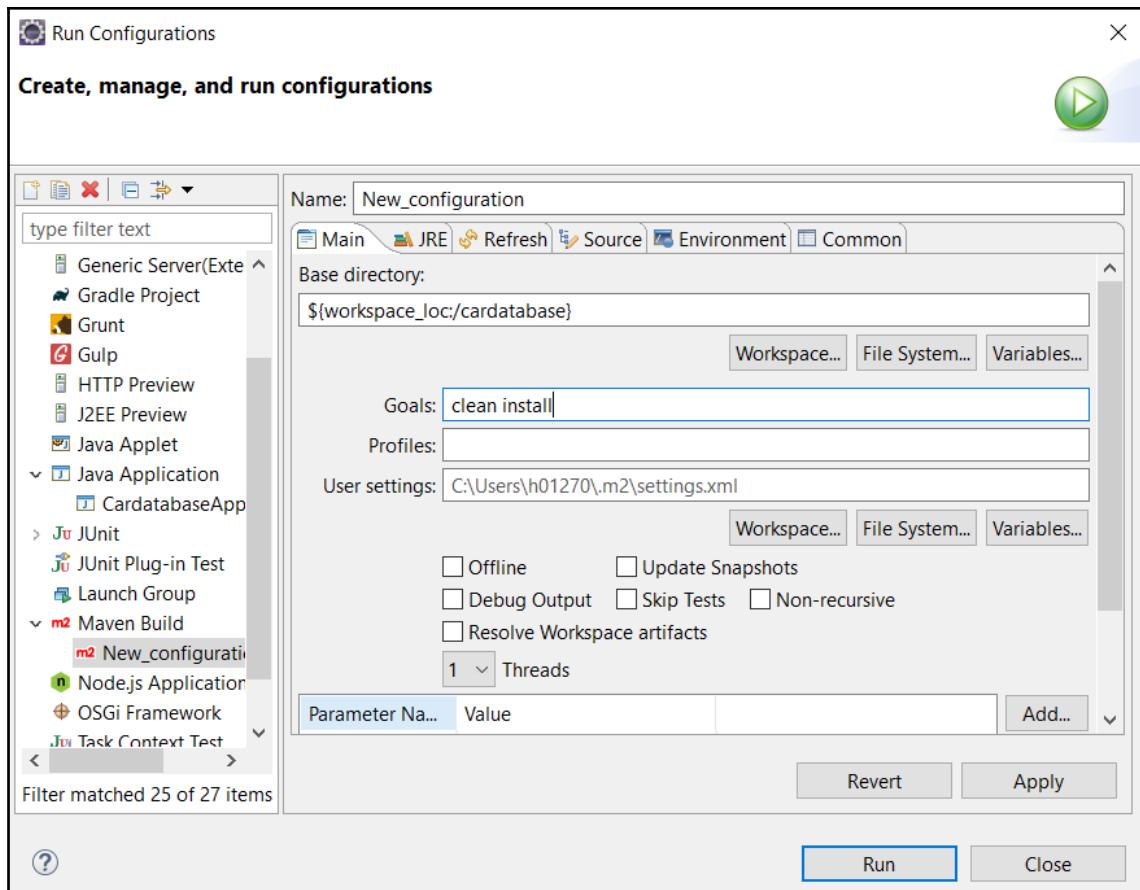
Host: n7qmaptg5baip9z.ch... Database: ebp6gq2544v5gcpc 

Name	Rows	Size	Created	Updated	Engine
car	0	1,0 KiB	2018-05-26 11:07:56	2018-05-26 11:07:56	MyISAM
hibernate_sequ...	2	1,0 KiB	2018-05-26 11:07:56	2018-05-26 11:07:56	MyISAM
owner	0	1,0 KiB	2018-05-26 11:07:56	2018-05-26 11:07:56	MyISAM
user	0	4,0 KiB	2018-05-26 11:07:56	2018-05-26 11:07:56	MyISAM



```
remote:  
remote: The build folder is ready to be deployed.  
remote: You may serve it with a static server:  
remote:  
remote:   yarn global add serve  
remote:   serve -s build  
remote:  
remote: Find out more about deployment here:  
remote:  
remote:   http://bit.ly/2vY88Kr  
remote:  
remote: =====> Downloading Buildpack: https://github.com/heroku/heroku-buildpack-static.git  
remote: =====> Detected Framework: Static HTML  
remote:   % Total     % Received % Xferd  Average Speed   Time   Time     Time  Current  
remote:          Dload  Upload Total Spent   Left Speed  
remote: 100  838k  100  838k    0      0 5894k      0 --::-- --::-- --::-- 5905k  
remote: -----> Installed directory to /app/bin  
remote: Using release configuration from last framework (Static HTML).  
remote: -----> Discovering process types  
remote:       Procfile declares types    -> (none)  
remote:       Default types for buildpack -> web  
remote:  
remote: -----> Compressing...  
remote:       Done: 47.6M  
remote: -----> Launching...  
remote:       Released v4  
remote:       https://carfront.herokuapp.com/ deployed to Heroku  
remote:  
remote: Verifying deploy... done.  
To https://git.heroku.com/carfront.git  
  32a5ecd..4565486  master -> master
```





classes	21.4.2019 16:30	File folder
generated-sources	21.4.2019 16:30	File folder
generated-test-sources	21.4.2019 16:30	File folder
maven-archiver	21.4.2019 16:30	File folder
maven-status	21.4.2019 16:30	File folder
surefire-reports	21.4.2019 16:30	File folder
test-classes	21.4.2019 16:30	File folder
cardatabase-0.0.1-SNAPSHOT.jar	21.4.2019 16:31	Executable Jar File

```
PS C:\work\carBackEnd> docker build -t carbackend .
Sending build context to Docker daemon 32.67MB
Step 1/5 : FROM openjdk:8-jdk-alpine
--> 224765a6bdbe
Step 2/5 : VOLUME /tmp
--> Using cache
--> a03de6ca0e4e
Step 3/5 : ARG JAR_FILE
--> Using cache
--> f237684c815f
Step 4/5 : COPY target/cardatabase-0.0.1-SNAPSHOT.jar app.jar
--> Using cache
--> 13c0ee6b4cd2
Step 5/5 : ENTRYPOINT ["java","-Djava.security.egd=file:/dev/./urandom","-jar","/app.jar"]
--> Using cache
--> 7edc33ec6be6
Successfully built 7edc33ec6be6
Successfully tagged carbackend:latest
```

```
PS C:\work\carBackEnd> docker image ls
REPOSITORY          TAG      IMAGE ID      CREATED       SIZE
carbackend          latest   7edc33ec6be6  2 minutes ago  134MB
openjdk              8-jdk-alpine   224765a6bdbe  4 months ago  102MB
```

```
s): 8080 (http) with context path ''
2018-05-27 12:48:34.234  INFO 1 --- [           main] c.p.cardatabase.CardatabaseApplication : Started CardatabaseAppl
ication in 6.67 seconds (JVM running for 7.3)
Hibernate: select next_val as id_val from hibernate_sequence for update
Hibernate: update hibernate_sequence set next_val= ? where next_val=?
Hibernate: insert into owner (firstname, lastname, ownerid) values (?, ?, ?)
Hibernate: select next_val as id_val from hibernate_sequence for update
Hibernate: update hibernate_sequence set next_val= ? where next_val=?
Hibernate: insert into owner (firstname, lastname, ownerid) values (?, ?, ?)
Hibernate: select next_val as id_val from hibernate_sequence for update
Hibernate: update hibernate_sequence set next_val= ? where next_val=?
Hibernate: insert into car (brand, color, model, owner, price, register_number, year, id) values (?, ?, ?, ?, ?, ?, ?, ?, ?)
Hibernate: select next_val as id_val from hibernate_sequence for update
Hibernate: update hibernate_sequence set next_val= ? where next_val=?
Hibernate: insert into car (brand, color, model, owner, price, register_number, year, id) values (?, ?, ?, ?, ?, ?, ?, ?, ?)
Hibernate: select next_val as id_val from hibernate_sequence for update
Hibernate: update hibernate_sequence set next_val= ? where next_val=?
Hibernate: insert into car (brand, color, model, owner, price, register_number, year, id) values (?, ?, ?, ?, ?, ?, ?, ?, ?)
Hibernate: insert into user (password, role, username) values (?, ?, ?)
Hibernate: insert into user (password, role, username) values (?, ?, ?)
```

Chapter 16: Best Practices

No images