Learning Spring Boot

Greg L. Turnquist

Video 2.2

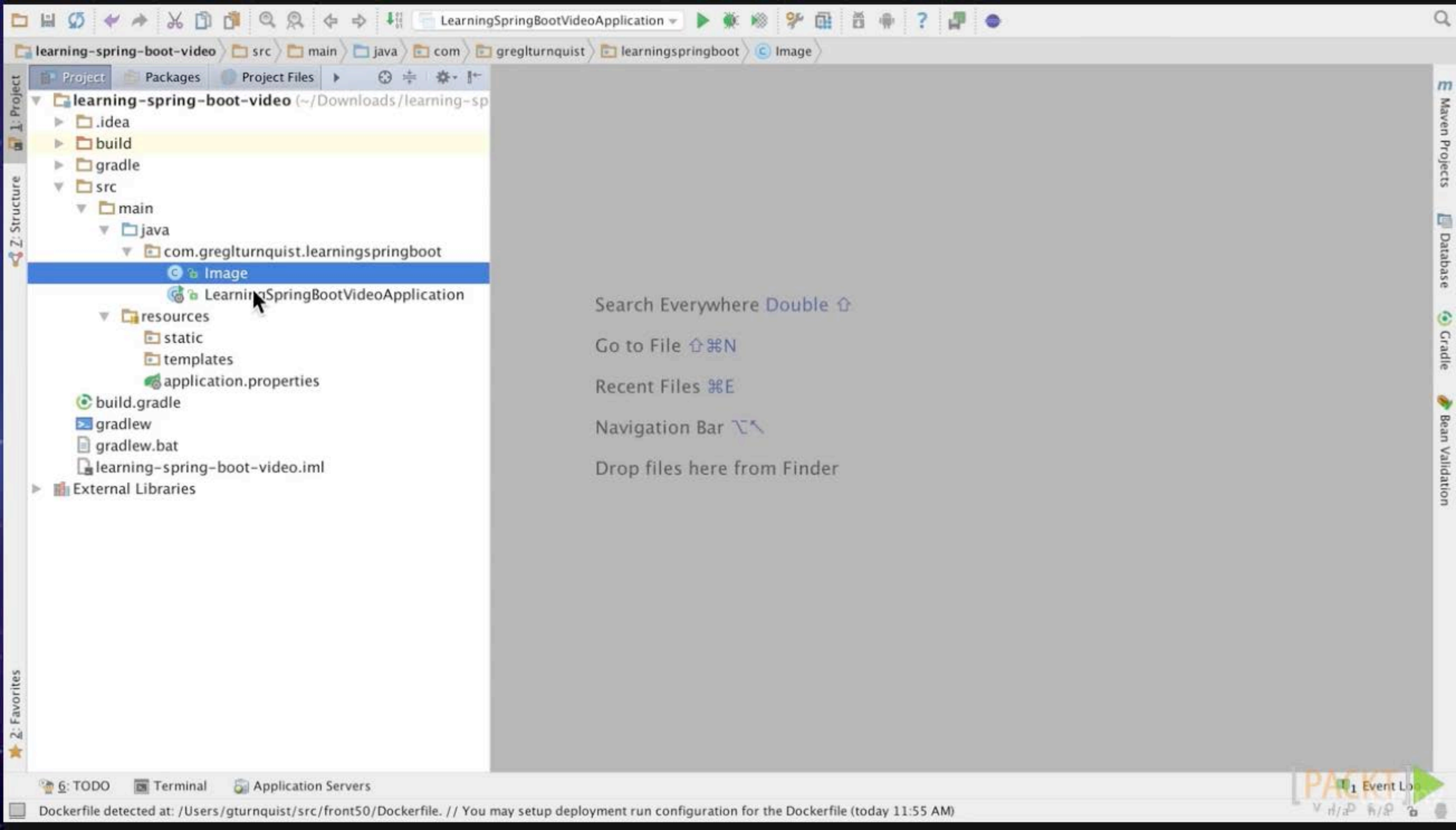
Creating a Repository Interface for the Image Domain Object

[PACKT] VIDEO udemy

In this Video, we are going to take a look at...

- Creating a custom repository by declaring an interface
- Touring Spring Data's PagingAndSortingRepository
- Creating a custom finder method

[PACKT] VIDEO udemy


LearningSpringBootVideoApplication
learning-spring-boot-video
src
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greglturnquist
learningspringboot
Image
Project
Packages
Project Files
learning-spring-boot-video (~/Downloads/learning-sp
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LearningSpringBootVideoApplication
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templates
application.properties
build.gradle
gradlew
gradlew.bat
learning-spring-boot-video.iml
External Libraries
Search Everywhere Double ⇧
Go to File ⇧⌘N
Recent Files ⌘E
Navigation Bar ⌥↖
Drop files here from Finder
1: Project
Z: Structure
2: Favorites
Maven Projects
Database
Gradle
Bean Validation
6: TODO
Terminal
Application Servers
Event Log
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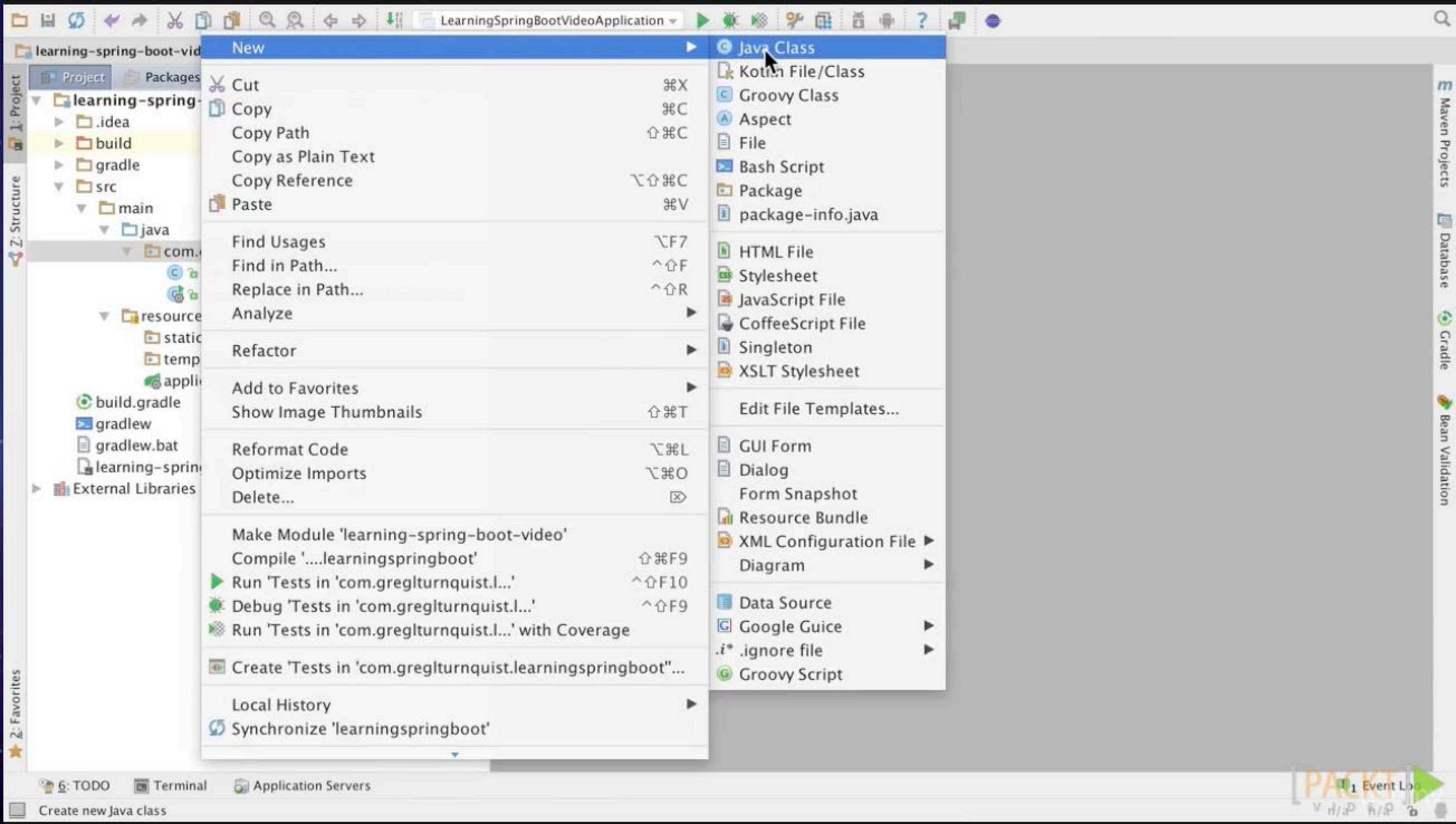
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Cut ⌘X
Copy ⌘C
Copy Path ⇧⌘C
Copy as Plain Text
Copy Reference ⌥⇧⌘C
Paste ⌘V
Find Usages ⌥F7
Find in Path... ^⇧F
Replace in Path... ^⇧R
Analyze
Refactor
Add to Favorites
Show Image Thumbnails ⇧⌘T
Reformat Code ⌥⌘L
Optimize Imports ⌥⌘O
Delete...
Make Module 'learning-spring-boot-video'
Compile '....learningspringboot' ⇧⌘F9
Run 'Tests in 'com.greglturnquist.l...' ^⇧F10
Debug 'Tests in 'com.greglturnquist.l...' ^⇧F9
Run 'Tests in 'com.greglturnquist.l...' with Coverage
Create 'Tests in 'com.greglturnquist.learningspringboot''...
Local History
Synchronize 'learningspringboot'
Java Class
Kotlin File/Class
Groovy Class
Aspect
File
Bash Script
Package
package-info.java
HTML File
Stylesheet
JavaScript File
CoffeeScript File
Singleton
XSLT Stylesheet
Edit File Templates...
GUI Form
Dialog
Form Snapshot
Resource Bundle
XML Configuration File
Diagram
Data Source
Google Guice
.ignore file
Groovy Script
1: Project
Z: Structure
2: Favorites
Maven Projects
Database
Gradle
Bean Validation
6: TODO
Terminal
Application Servers
Event Log
Create new Java class

LearningSpringBootVideoApplication

learning-spring-boot-video › src › main › java › com › greglturnquist › learningspringboot

Project | Packages | Project Files

learning-spring-boot-video (~/Downloads/learning-sp
- .idea
- build
- gradle
- src
  - main
    - java
      - com.greglturnquist.learningspringboot
        - Image
        - LearningSpringBootVideoApplication
    - resources
      - static
      - templates
      - application.properties
- build.gradle
- gradlew
- gradlew.bat
- learning-spring-boot-video.iml
- External Libraries

Search Everywhere Double ⇧

Create New Class

Name: ImageRepository

Kind: Interface

Cancel | OK

1: Project | Z: Structure | 2: Favorites

Maven Projects | Database | Gradle | Bean Validation

6: TODO | Terminal | Application Servers | 1 Event Log

Dockerfile detected at: /Users/gturnquist/src/front50/Dockerfile. // You may setup deployment run configuration for the Dockerfile (today 11:55 AM)

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LearningSpringBootVideoApplication

learning-spring-boot-video > src > main > java > com > greglturnquist > learningspringboot

Project | Packages | Project Files

- learning-spring-boot-video (~/Downloads/learning-sp
  - .idea
  - build
  - gradle
  - src
    - main
      - java
        - com.greglturnquist.learningspringboot
          - Image
          - LearningSpringBootVideoApplication
      - resources
        - static
        - templates
        - application.properties
  - build.gradle
  - gradlew
  - gradlew.bat
  - learning-spring-boot-video.iml
- External Libraries

ImageRepository.java

```
1   /.../
16  package com.greglturnquist.learningspringboot;
17
18  /**
19   * @author Greg Turnquist
20   */
21  public interface ImageRepository {
22
23  }
24
```

1: Project | Z: Structure | 2: Favorites | Maven Projects | Database | Gradle | Bean Validation

6: TODO | Terminal | Application Servers | Event Log

Dockerfile detected at: /Users/gturnquist/src/front50/Dockerfile. // You may setup deployment run configuration for the Dockerfile (today 11:55 AM)

21:33 LF

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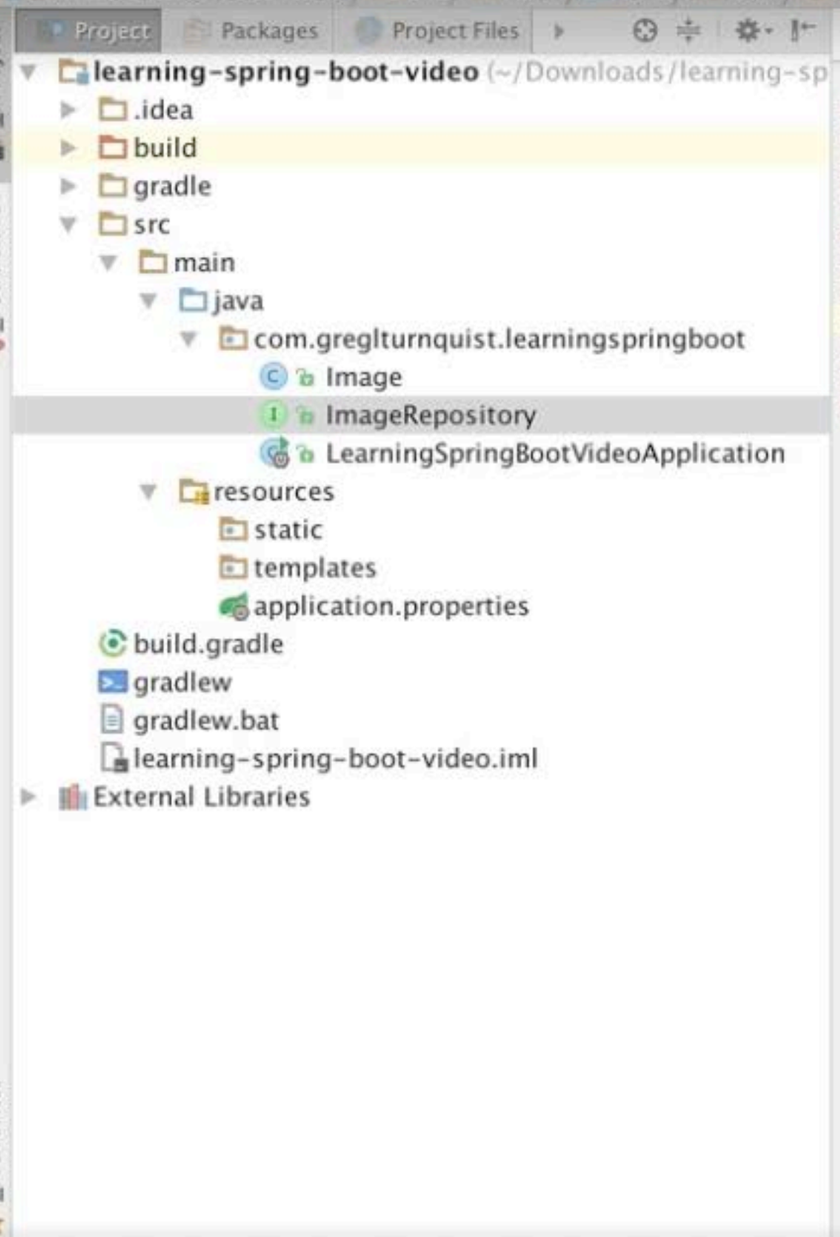
learning-spring-boot-video › src › main › java › com › greglturnquist › learningspringboot › ImageRepository

Project | Packages | Project Files



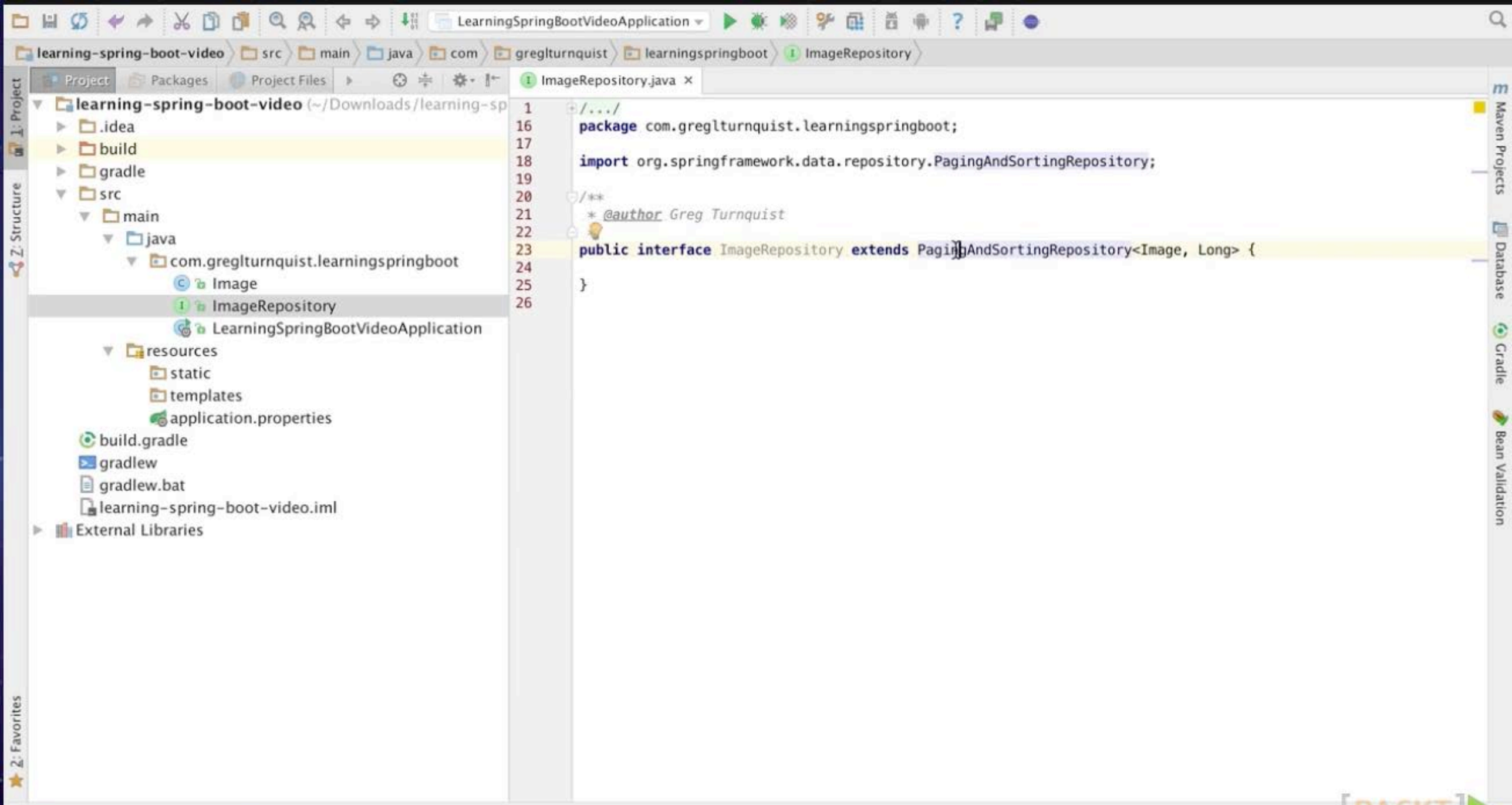
ImageRepository.java

```
1   /.../
16  package com.greglturnquist.learningspringboot;
17
18  import org.springframework.data.repository.PagingAndSortingRepository;
19
20  /**
21   * @author Greg Turnquist
22   */
23  public interface ImageRepository extends PagingAndSortingRepository<Image, Long> {
24
25  }
26
```

Maven Projects | Database | Gradle | Bean Validation | 1: Project | Z: Structure | 2: Favorites

6: TODO | Terminal | Application Servers

Dockerfile detected at /Users/rgturnquist/src/front50/Dockerfile. // You may setup deployment run configuration for the Dockerfile (today 11:55 AM)


LearningSpringBootVideoApplication
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learningspringboot
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Project Files
ImageRepository.java
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Image
ImageRepository
LearningSpringBootVideoApplication
resources
static
templates
application.properties
build.gradle
gradlew
gradlew.bat
learning-spring-boot-video.iml
External Libraries
1 /.../
16 package com.greglturnquist.learningspringboot;
17
18 import org.springframework.data.repository.PagingAndSortingRepository;
19
20 /**
21 * @author Greg Turnquist
22
23 public interface ImageRepository extends PagingAndSortingRepository<Image, Long> {
24
25 }
26
1: Project
Z: Structure
2: Favorites
Maven Projects
Database
Gradle
Bean Validation
6: TODO
Terminal
Application Servers
Event Log
Dockerfile detected at: /Users/gturnquist/src/front50/Dockerfile. // You may setup deployment run configuration for the Dockerfile (today 11:55 AM)
23:47
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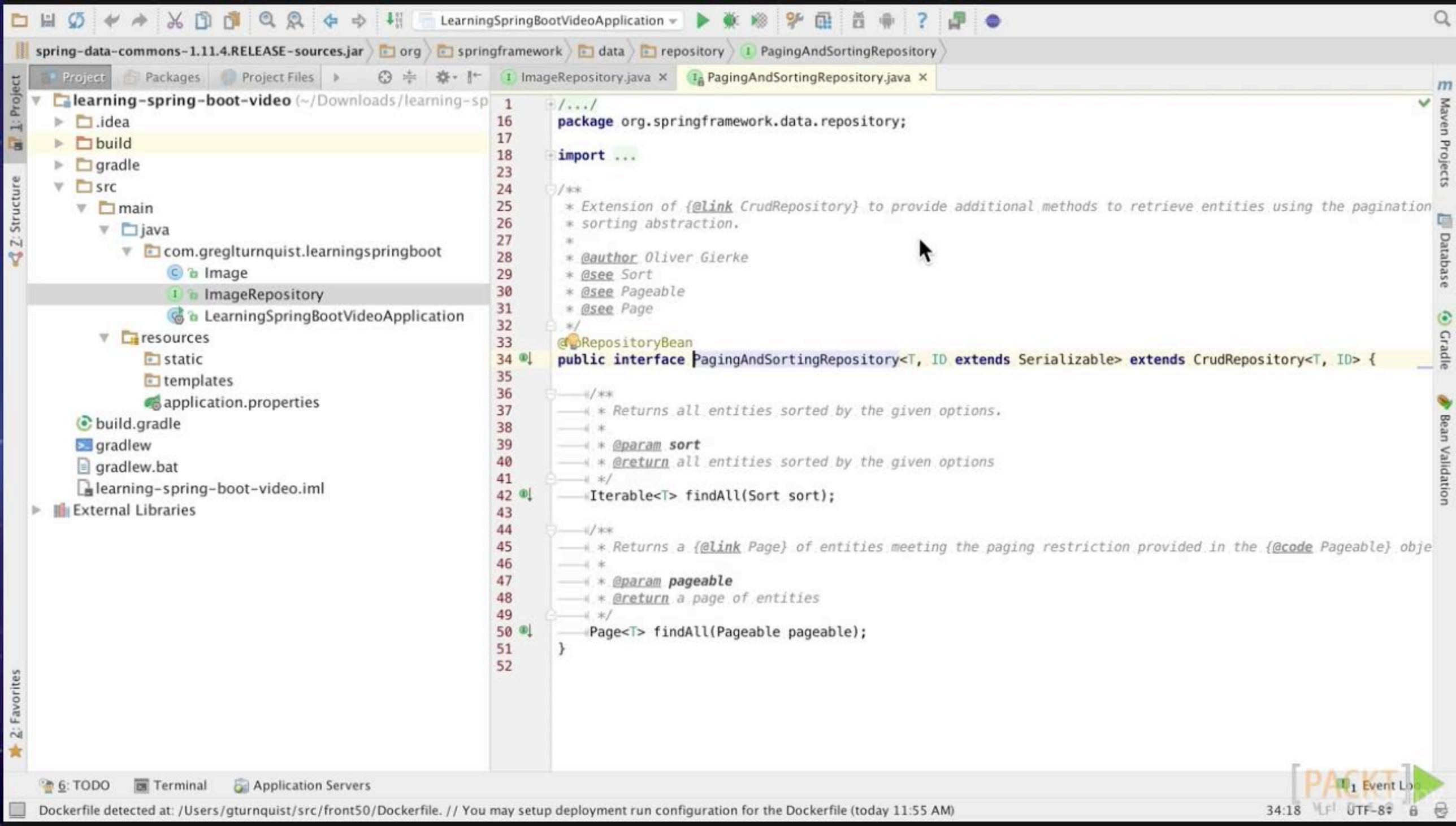
LearningSpringBootVideoApplication
spring-data-commons-1.11.4.RELEASE-sources.jar
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Image
ImageRepository
LearningSpringBootVideoApplication
resources
static
templates
application.properties
build.gradle
gradlew
gradlew.bat
learning-spring-boot-video.iml
External Libraries
ImageRepository.java
PagingAndSortingRepository.java
1 /.../
16 package org.springframework.data.repository;
17
18 import ...
23
24 /**
25 * Extension of {@link CrudRepository} to provide additional methods to retrieve entities using the pagination
26 * sorting abstraction.
27 *
28 * @author Oliver Gierke
29 * @see Sort
30 * @see Pageable
31 * @see Page
32 */
33 @RepositoryBean
34 public interface PagingAndSortingRepository<T, ID extends Serializable> extends CrudRepository<T, ID> {
35
36 /**
37 * Returns all entities sorted by the given options.
38 *
39 * @param sort
40 * @return all entities sorted by the given options
41 */
42 Iterable<T> findAll(Sort sort);
43
44 /**
45 * Returns a {@link Page} of entities meeting the paging restriction provided in the {@code Pageable} obje
46 *
47 * @param pageable
48 * @return a page of entities
49 */
50 Page<T> findAll(Pageable pageable);
51 }
52
Maven Projects
Database
Gradle
Bean Validation
1: Project
Z: Structure
2: Favorites
6: TODO
Terminal
Application Servers
1 Event Log
Dockerfile detected at: /Users/gturnquist/src/front50/Dockerfile. // You may setup deployment run configuration for the Dockerfile (today 11:55 AM)
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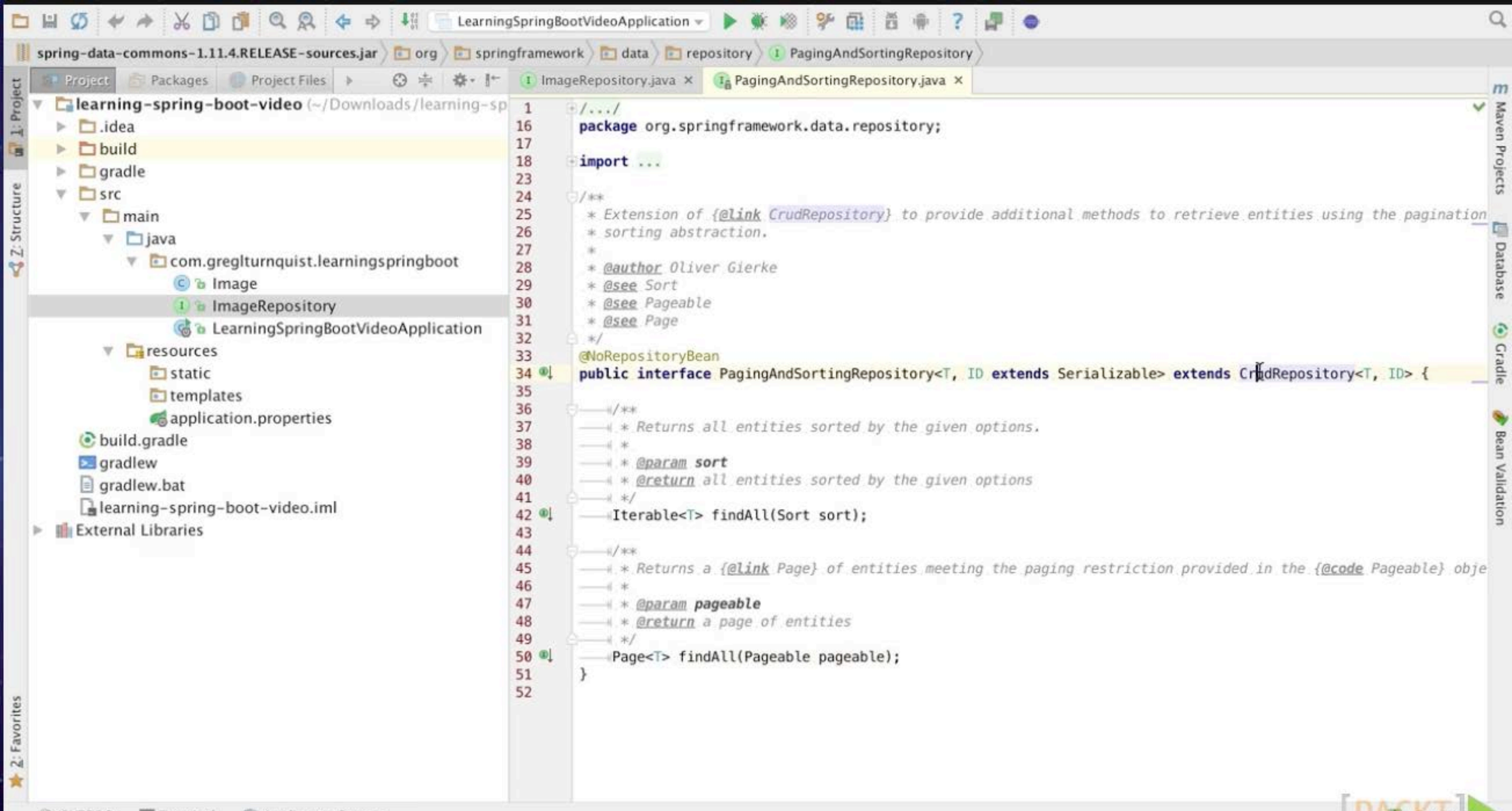
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ImageRepository
LearningSpringBootVideoApplication
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static
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application.properties
build.gradle
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gradlew.bat
learning-spring-boot-video.iml
External Libraries
ImageRepository.java
PagingAndSortingRepository.java
/.../
package org.springframework.data.repository;
import ...
/**
* Extension of {@link CrudRepository} to provide additional methods to retrieve entities using the pagination
* sorting abstraction.
*
* @author Oliver Gierke
* @see Sort
* @see Pageable
* @see Page
*/
@NoRepositoryBean
public interface PagingAndSortingRepository<T, ID extends Serializable> extends CrudRepository<T, ID> {
/**
* Returns all entities sorted by the given options.
*
* @param sort
* @return all entities sorted by the given options
*/
Iterable<T> findAll(Sort sort);
/**
* Returns a {@link Page} of entities meeting the paging restriction provided in the {@code Pageable} obje
*
* @param pageable
* @return a page of entities
*/
Page<T> findAll(Pageable pageable);
}
1: Project
Z: Structure
2: Favorites
Maven Projects
Database
Gradle
Bean Validation
6: TODO
Terminal
Application Servers
1 Event Log
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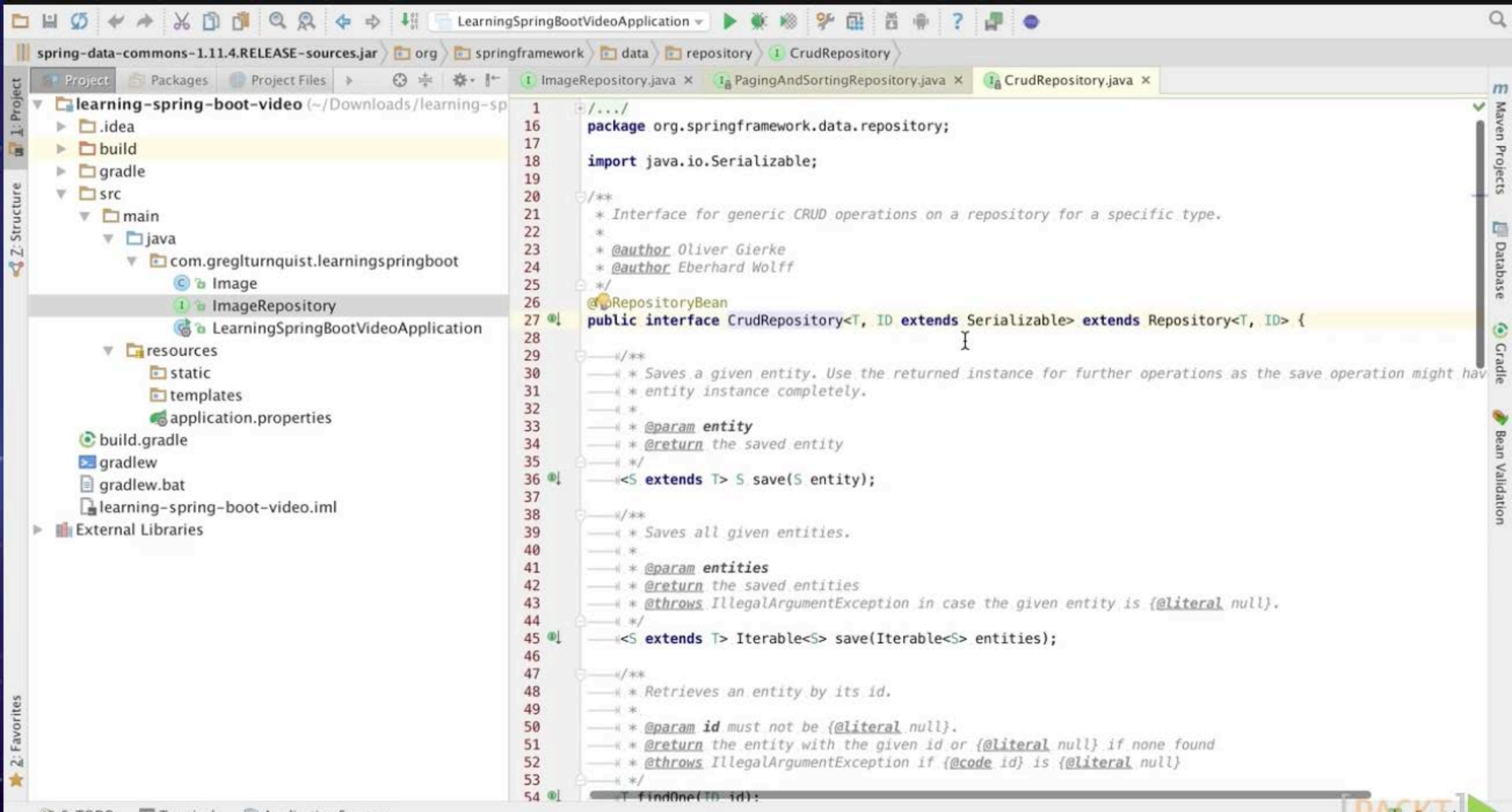
LearningSpringBootVideoApplication
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ImageRepository
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templates
application.properties
build.gradle
gradlew
gradlew.bat
learning-spring-boot-video.iml
External Libraries
ImageRepository.java
PagingAndSortingRepository.java
CrudRepository.java
1 /.../
16 package org.springframework.data.repository;
17
18 import java.io.Serializable;
19
20 /**
21 * Interface for generic CRUD operations on a repository for a specific type.
22 *
23 * @author Oliver Gierke
24 * @author Eberhard Wolff
25 */
26 @NoRepositoryBean
27 public interface CrudRepository<T, ID extends Serializable> extends Repository<T, ID> {
28
29 /**
30 * Saves a given entity. Use the returned instance for further operations as the save operation might hav
31 * entity instance completely.
32 *
33 * @param entity
34 * @return the saved entity
35 */
36 <S extends T> S save(S entity);
37
38 /**
39 * Saves all given entities.
40 *
41 * @param entities
42 * @return the saved entities
43 * @throws IllegalArgumentException in case the given entity is {@literal null}.
44 */
45 <S extends T> Iterable<S> save(Iterable<S> entities);
46
47 /**
48 * Retrieves an entity by its id.
49 *
50 * @param id must not be {@literal null}.
51 * @return the entity with the given id or {@literal null} if none found
52 * @throws IllegalArgumentException if {@code id} is {@literal null}
53 */
54 T findOne(ID id);
Maven Projects
Database
Gradle
Bean Validation
1: Project
Z: Structure
2: Favorites
6: TODO
Terminal
Application Servers
Event Log
Dockerfile detected at: /Users/gturnquist/src/front50/Dockerfile. // You may setup deployment run configuration for the Dockerfile (today 11:55 AM)
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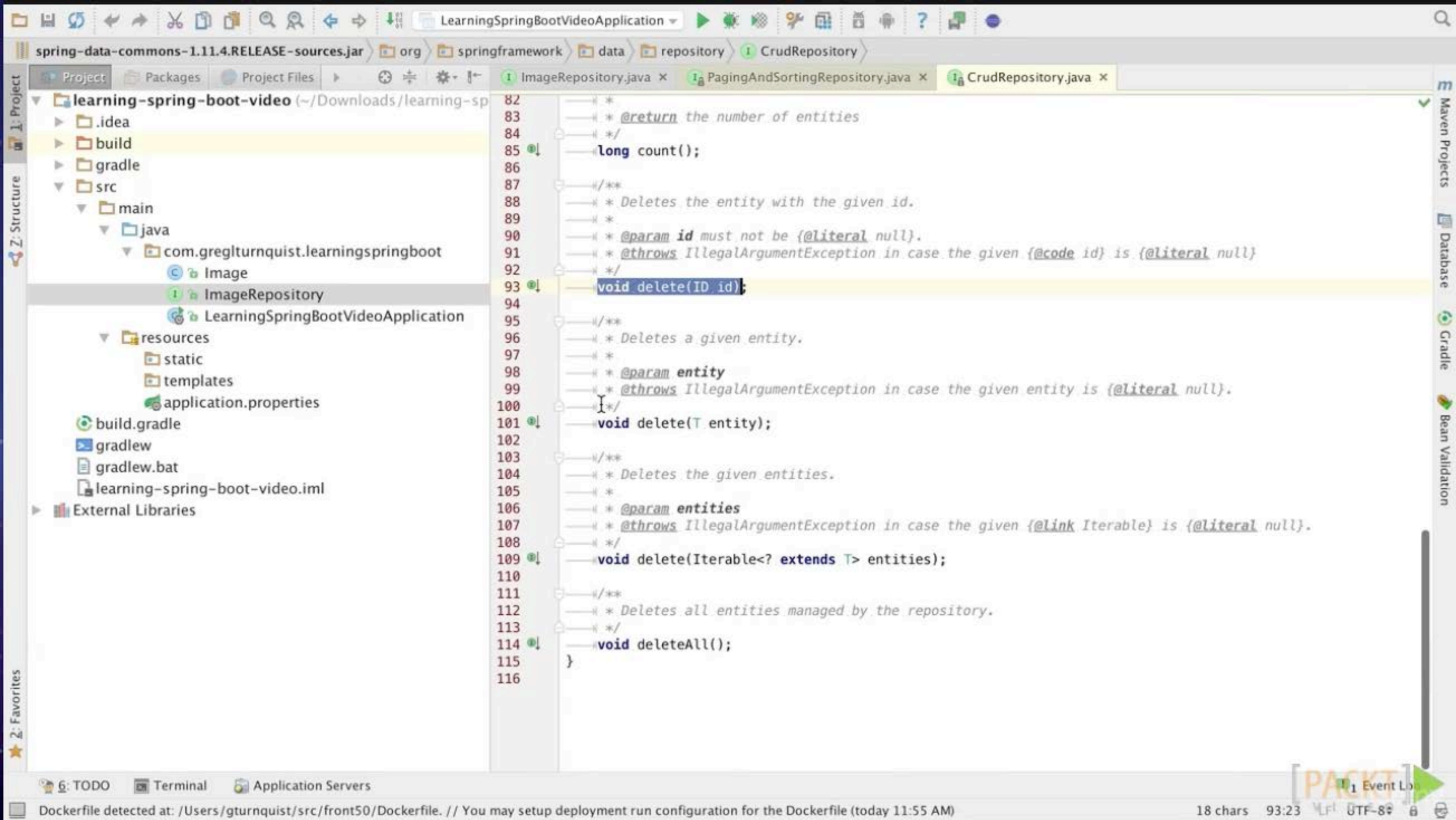
LearningSpringBootVideoApplication
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CrudRepository
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LearningSpringBootVideoApplication
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templates
application.properties
build.gradle
gradlew
gradlew.bat
learning-spring-boot-video.iml
External Libraries
ImageRepository.java
PagingAndSortingRepository.java
CrudRepository.java
* @return the number of entities
*/
long count();
/**
* Deletes the entity with the given id.
*
* @param id must not be {@literal null}.
* @throws IllegalArgumentException in case the given {@code id} is {@literal null}
*/
void delete(ID id);
/**
* Deletes a given entity.
*
* @param entity
* @throws IllegalArgumentException in case the given entity is {@literal null}.
*/
void delete(T entity);
/**
* Deletes the given entities.
*
* @param entities
* @throws IllegalArgumentException in case the given {@link Iterable} is {@literal null}.
*/
void delete(Iterable<? extends T> entities);
/**
* Deletes all entities managed by the repository.
*/
void deleteAll();
}
Maven Projects
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Gradle
Bean Validation
1: Project
Z: Structure
2: Favorites
6: TODO
Terminal
Application Servers
Event Log
Dockerfile detected at: /Users/gturnquist/src/front50/Dockerfile. // You may setup deployment run configuration for the Dockerfile (today 11:55 AM)
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LearningSpringBootVideoApplication

spring-data-commons-1.11.4.RELEASE-sources.jar › org › springframework › data › repository › CrudRepository

Project | Packages | Project Files

learning-spring-boot-video (~/Downloads/learning-sp
- .idea
- build
- gradle
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  - main
    - java
      - com.greglturnquist.learningspringboot
        - Image
        - ImageRepository
        - LearningSpringBootVideoApplication
    - resources
      - static
      - templates
      - application.properties
- build.gradle
- gradlew
- gradlew.bat
- learning-spring-boot-video.iml

External Libraries

ImageRepository.java | PagingAndSortingRepository.java | CrudRepository.java

```
1   /.../
16  package org.springframework.data.repository;
17
18  import java.io.Serializable;
19
20  /**
21   * Interface for generic CRUD operations on a repository for a specific type.
22   *
23   * @author Oliver Gierke
24   * @author Eberhard Wolff
25   */
26  @NoRepositoryBean
27  public interface CrudRepository<T, ID extends Serializable> extends Repository<T, ID> {
28
29      /**
30       * Saves a given entity. Use the returned instance for further operations as the save operation might hav
31       * entity instance completely.
32       *
33       * @param entity
34       * @return the saved entity
35       */
36      <S extends T> S save(S entity);
37
38      /**
39       * Saves all given entities.
40       *
41       * @param entities
42       * @return the saved entities
43       * @throws IllegalArgumentException in case the given entity is {@literal null}.
44       */
45      <S extends T> Iterable<S> save(Iterable<S> entities);
46
47      /**
48       * Retrieves an entity by its id.
49       *
50       * @param id must not be {@literal null}.
51       * @return the entity with the given id or {@literal null} if none found
52       * @throws IllegalArgumentException if {@code id} is {@literal null}
53       */
54      T findOne(ID id);
```

Maven Projects | Database | Gradle | Bean Validation

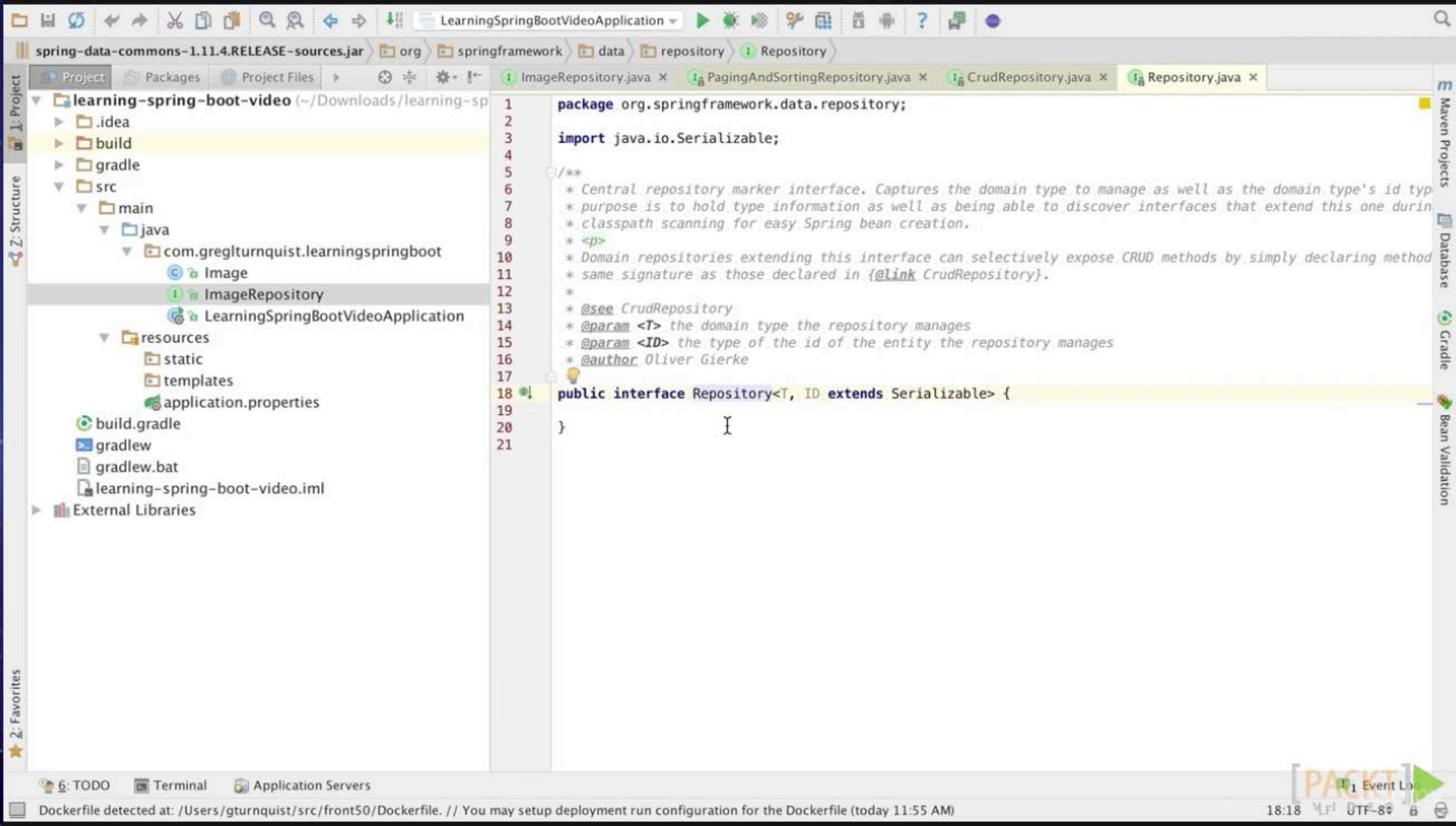
2: Favorites

6: TODO | Terminal | Application Servers | 1 Event Log

Dockerfile detected at: /Users/gturnquist/src/front50/Dockerfile. // You may setup deployment run configuration for the Dockerfile (today 11:55 AM)

27:73 LF UTF-8

PACKT


LearningSpringBootVideoApplication
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ImageRepository
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application.properties
build.gradle
gradlew
gradlew.bat
learning-spring-boot-video.iml
External Libraries
ImageRepository.java
PagingAndSortingRepository.java
CrudRepository.java
Repository.java
package org.springframework.data.repository;
import java.io.Serializable;
/**
* Central repository marker interface. Captures the domain type to manage as well as the domain type's id typ
* purpose is to hold type information as well as being able to discover interfaces that extend this one durin
* classpath scanning for easy Spring bean creation.
* <p>
* Domain repositories extending this interface can selectively expose CRUD methods by simply declaring method
* same signature as those declared in {@link CrudRepository}.
*
* @see CrudRepository
* @param <T> the domain type the repository manages
* @param <ID> the type of the id of the entity the repository manages
* @author Oliver Gierke
public interface Repository<T, ID extends Serializable> {
}
1: Project
Z: Structure
2: Favorites
Maven Projects
Database
Gradle
Bean Validation
6: TODO
Terminal
Application Servers
1 Event Log
Dockerfile detected at: /Users/gturnquist/src/front50/Dockerfile. // You may setup deployment run configuration for the Dockerfile (today 11:55 AM)
18:18
UTF-8

LearningSpringBootVideoApplication

learning-spring-boot-video > src > main > java > com > greglturnquist > learningspringboot > ImageRepository

Project | Packages | Project Files

- learning-spring-boot-video (~/Downloads/learning-sp
  - .idea
  - build
  - gradle
  - src
    - main
      - java
        - com.greglturnquist.learningspringboot
          - Image
          - ImageRepository
          - LearningSpringBootVideoApplication
      - resources
        - static
        - templates
        - application.properties
  - build.gradle
  - gradlew
  - gradlew.bat
  - learning-spring-boot-video.iml
- External Libraries

ImageRepository.java

```
1   /.../
16  package com.greglturnquist.learningspringboot;
17
18  import org.springframework.data.repository.PagingAndSortingRepository;
19
20  /**
21   * @author Greg Turnquist
22   */
23  public interface ImageRepository extends PagingAndSortingRepository<Image, Long> {
24
25  }
26
```

1: Project | Z: Structure | 2: Favorites | Maven Projects | Database | Gradle | Bean Validation

6: TODO | Terminal | Application Servers | Event Log

Dockerfile detected at: /Users/gturnquist/src/front50/Dockerfile. // You may setup deployment run configuration for the Dockerfile (today 11:55 AM)

23:47 LF UTF-8

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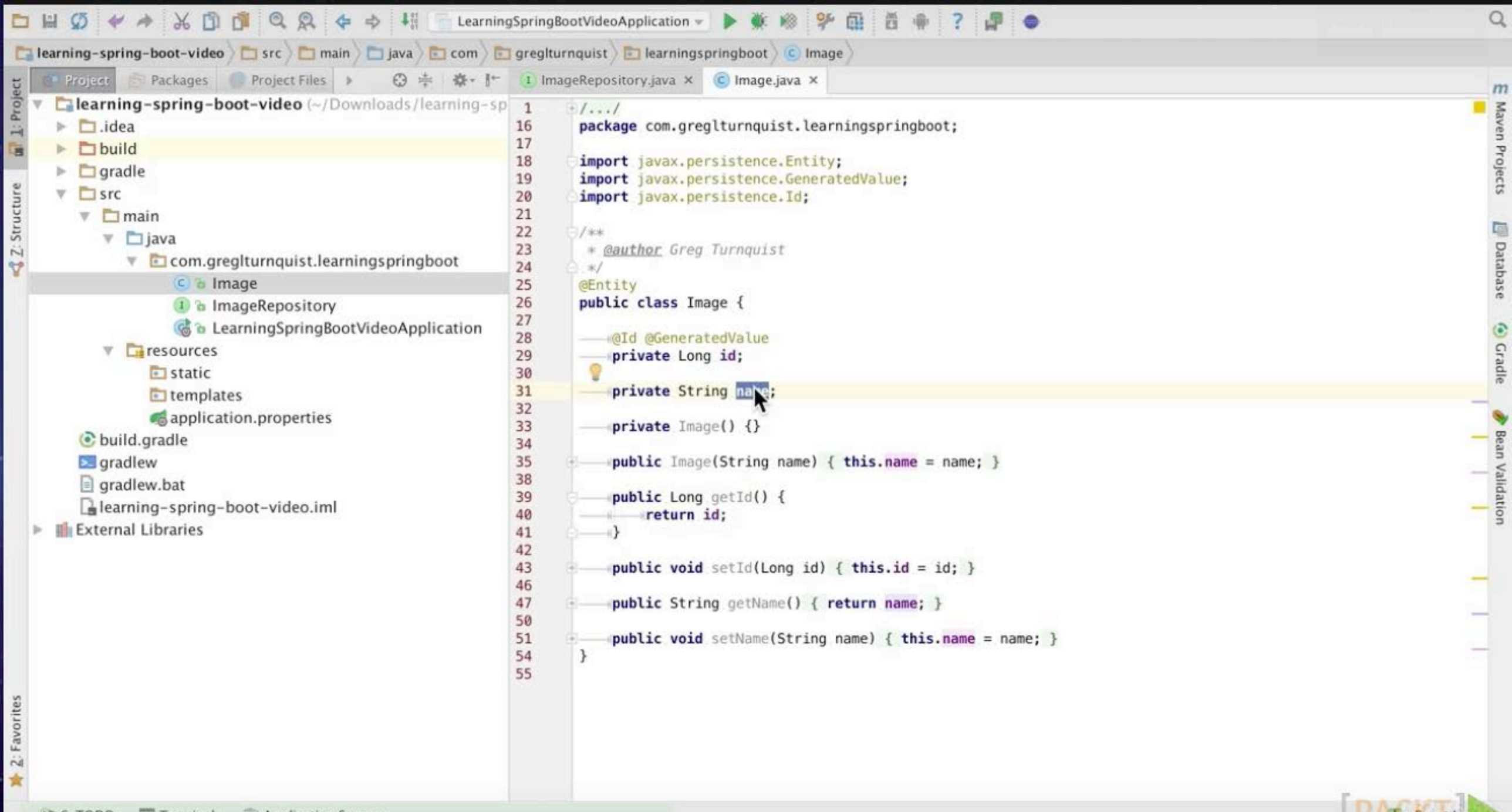
LearningSpringBootVideoApplication
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Image
ImageRepository
LearningSpringBootVideoApplication
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application.properties
build.gradle
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gradlew.bat
learning-spring-boot-video.iml
External Libraries
1 /.../
16 package com.greglturnquist.learningspringboot;
17
18 import javax.persistence.Entity;
19 import javax.persistence.GeneratedValue;
20 import javax.persistence.Id;
21
22 /**
23 * @author Greg Turnquist
24 */
25 @Entity
26 public class Image {
27
28 @Id @GeneratedValue
29 private Long id;
30
31 private String name;
32
33 private Image() {}
34
35 public Image(String name) { this.name = name; }
38
39 public Long getId() {
40 return id;
41 }
42
43 public void setId(Long id) { this.id = id; }
46
47 public String getName() { return name; }
50
51 public void setName(String name) { this.name = name; }
54 }
55
1: Project
Z: Structure
2: Favorites
Maven Projects
Database
Gradle
Bean Validation
6: TODO
Terminal
Application Servers
Event Log
Dockerfile detected at: /Users/gturnquist/src/front50/Dockerfile. // You may setup deployment run configuration for the Dockerfile (today 11:55 AM)
4 chars
31:24
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UTF-8

LearningSpringBootVideoApplication

learning-spring-boot-video › src › main › java › com › greglturnquist › learningspringboot › ImageRepository

Project | Packages | Project Files

- learning-spring-boot-video (~/Downloads/learning-sp
  - .idea
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    - main
      - java
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          - Image
          - ImageRepository
          - LearningSpringBootVideoApplication
      - resources
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        - templates
        - application.properties
  - build.gradle
  - gradlew
  - gradlew.bat
  - learning-spring-boot-video.iml
- External Libraries

ImageRepository.java × | Image.java ×

```
1   /.../
16  package com.greglturnquist.learningspringboot;
17
18  import org.springframework.data.repository.PagingAndSortingRepository;
19
20  /**
21   * @author Greg Turnquist
22   */
23  public interface ImageRepository extends PagingAndSortingRepository<Image, Long> {
24
25
26
27  }
28
```

1: Project | Z: Structure | 2: Favorites | Maven Projects | Database | Gradle | Bean Validation

6: TODO | Terminal | Application Servers | Event Log

Dockerfile detected at: /Users/gturnquist/src/front50/Dockerfile. // You may setup deployment run configuration for the Dockerfile (today 11:55 AM)

25:5 LF UTF-8

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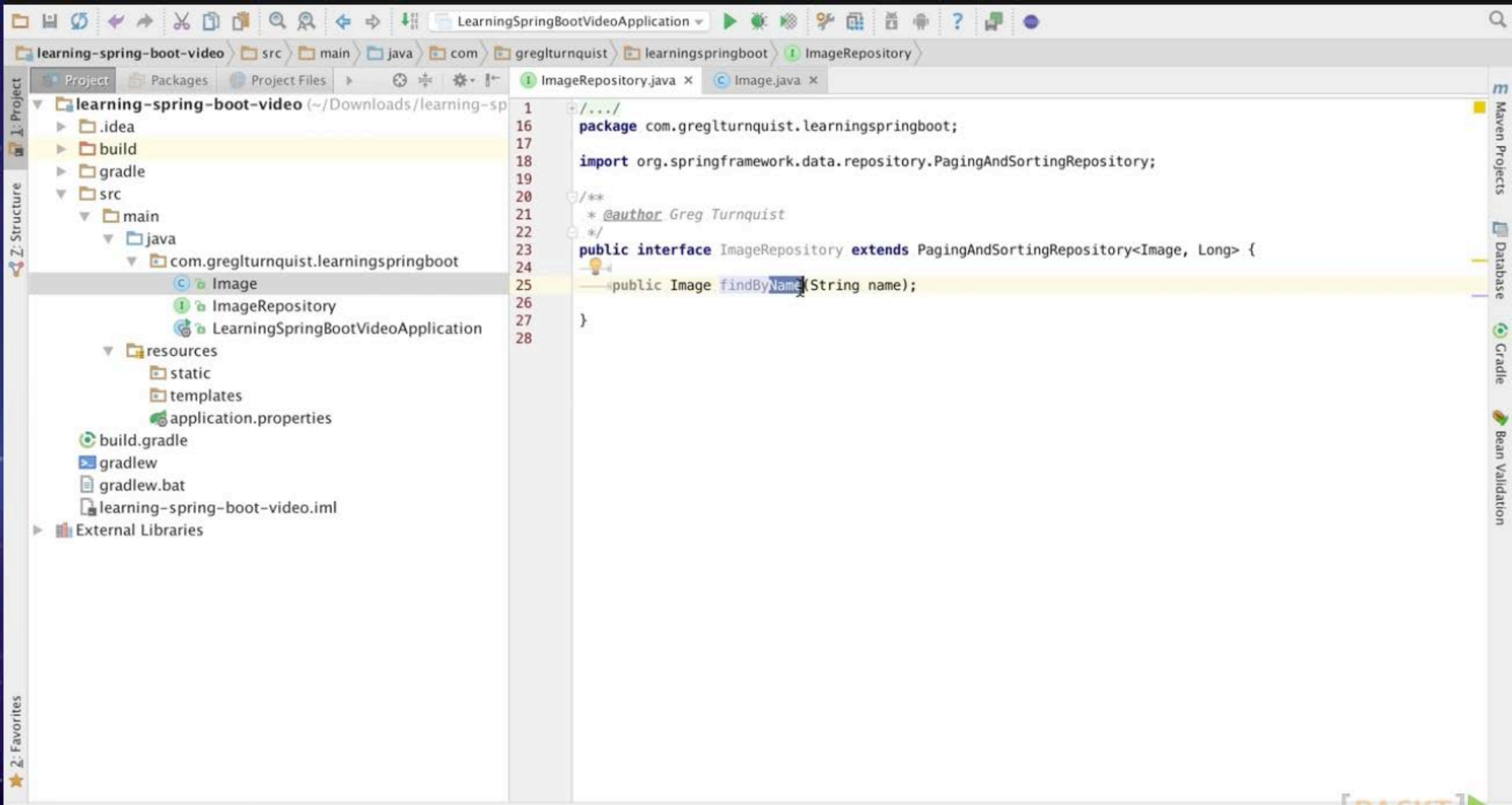
LearningSpringBootVideoApplication
learning-spring-boot-video
src
main
java
com
greglturnquist
learningspringboot
ImageRepository
Project
Packages
Project Files
ImageRepository.java
Image.java
learning-spring-boot-video (~/Downloads/learning-sp
.idea
build
gradle
src
main
java
com.greglturnquist.learningspringboot
Image
ImageRepository
LearningSpringBootVideoApplication
resources
static
templates
application.properties
build.gradle
gradlew
gradlew.bat
learning-spring-boot-video.iml
External Libraries
1 /.../
16 package com.greglturnquist.learningspringboot;
17
18 import org.springframework.data.repository.PagingAndSortingRepository;
19
20 /**
21 * @author Greg Turnquist
22 */
23 public interface ImageRepository extends PagingAndSortingRepository<Image, Long> {
24
25 public Image findByName(String name);
26
27 }
28
1: Project
Z: Structure
2: Favorites
Maven Projects
Database
Gradle
Bean Validation
6: TODO
Terminal
Application Servers
Event Log
Method 'findByName(java.lang.String)' is never used
4 chars
25:28
LF
UTF-8

Query Options

```
interface EmployeeRepository extends CrudRepository<Employee, Long>
{
        List<Employee> findByLastName(String f)
        List<Employee> findByFirstNameAndLastName(String f, String l)
        List<Employee> findByFirstNameAndManagerName(String f, String m)
        List<Employee> findTop10ByFirstName(…) // or findFirst10ByFirstName
        List<Employee> findDistinctEmployeesByFirstName(...)
        List<Employee> findByFirstNameAndLastNameAllIgnoreCase(...)
        List<Employee> findByFirstNameOrderByLastNameAsc(...)
        List<Employee> findByLastNameIsNull(...)
}
```

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Advanced Query Options

```
interface CoolRepo extends CrudRepository<Employee, Long>
{
        Stream<Employee> findByLastname(String lastname)
        @Async Future<Employee> findByLastname(…)
        @Async CompletableFuture<Employee> findByLastname(…)
        @Async ListenableFuture<Employee> findByLastname(…)

        Page<Employee> findAll(Pageable p)
        Page<Employee> findByFirstName(String f, Pageable p)
        List<Employee> findAll(Sort s)
        Page<Employee> findByFirstName(String f, Pageable p, Sort s)
}
```

Summary

- We declared a repository with a Java interface
- We extended it with a custom finder, writing zero code

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Next Section

Creating a File Upload Controller

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