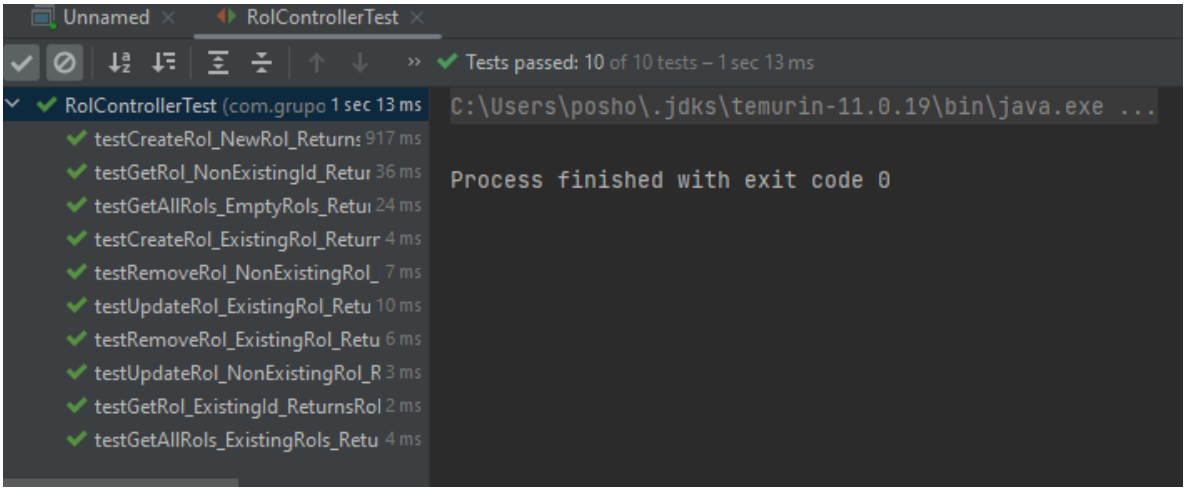
```java
package com.grupo9.digitalBooking.music.controllerTest;
import static org.junit.jupiter.api.Assertions.assertEquals;
import static org.junit.jupiter.api.Assertions.assertSame;
import static org.mockito.Mockito.*;

import java.util.HashSet;
import java.util.Set;

import
com.grupo9.digitalBooking.music.model.controller.RolController;
import org.junit.jupiter.api.BeforeEach;
import org.junit.jupiter.api.Test;
import org.mockito.InjectMocks;
import org.mockito.Mock;
import org.mockito.MockitoAnnotations;
import org.springframework.http.HttpStatus;
import org.springframework.http.ResponseEntity;

import com.grupo9.digitalBooking.music.model.DTO.RolDTO;
import
com.grupo9.digitalBooking.music.model.service.InterfacesService.IR
olService;

class RolControllerTest {

    @Mock
    private IRolService rolService;

    @InjectMocks
    private RolController rolController;

    @BeforeEach
    void setUp() {
        MockitoAnnotations.openMocks(this);
    }

    @Test
    void testGetRol_ExistingId_ReturnsRolDTO() {
        Long id = 1L;
        RolDTO rolDTO = new RolDTO();
        rolDTO.setId(id);
        rolDTO.setName("Admin");

        when(rolService.readRol(id)).thenReturn(rolDTO);

        ResponseEntity<?> response = rolController.getRol(id);

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertSame(rolDTO, response.getBody());

        verify(rolService).readRol(id);
        verifyNoMoreInteractions(rolService);
```

```
    }

    @Test
    void testGetRol_NonExistingId_ReturnsNotFound() {
        Long id = 1L;

        when(rolService.readRol(id)).thenReturn(null);

        ResponseEntity<?> response = rolController.getRol(id);

        assertSame(HttpStatus.BAD_REQUEST,
response.getStatusCode());
        assertEquals("Message: The role with " + id + " does not
exist", response.getBody());

        verify(rolService).readRol(id);
        verifyNoMoreInteractions(rolService);
    }

    @Test
    void testGetAllRols_ExistingRols_ReturnsRolsSet() {
        Set<RolDTO> rols = new HashSet<>();
        RolDTO rol1 = new RolDTO();
        rol1.setId(1L);
        rol1.setName("Admin");
        RolDTO rol2 = new RolDTO();
        rol2.setId(2L);
        rol2.setName("User");
        rols.add(rol1);
        rols.add(rol2);

        when(rolService.getAll()).thenReturn(rols);

        ResponseEntity<?> response = rolController.getAllRols();

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertSame(rols, response.getBody());

        verify(rolService).getAll();
        verifyNoMoreInteractions(rolService);
    }

    @Test
    void testGetAllRols_EmptyRols_ReturnsNotFound() {
        Set<RolDTO> rols = new HashSet<>();

        when(rolService.getAll()).thenReturn(rols);

        ResponseEntity<?> response = rolController.getAllRols();

        assertSame(HttpStatus.BAD_REQUEST,
response.getStatusCode());
```

```
        assertEquals("Message: There are not information",
response.getBody());

        verify(rolService).getAll();
        verifyNoMoreInteractions(rolService);
    }

    @Test
    void testCreateRol_NewRol_ReturnsCreatedRol() {
        RolDTO rolDTO = new RolDTO();
        rolDTO.setId(1L);
        rolDTO.setName("Admin");

        when(rolService.createRol(rolDTO)).thenReturn(rolDTO);

        ResponseEntity<?> response =
rolController.createRol(rolDTO);

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertSame(rolDTO, response.getBody());

        verify(rolService).createRol(rolDTO);
        verifyNoMoreInteractions(rolService);
    }

    @Test
    void testCreateRol_ExistingRol_ReturnsBadRequest() {
        RolDTO rolDTO = new RolDTO();
        rolDTO.setId(1L);
        rolDTO.setName("Admin");

        when(rolService.createRol(rolDTO)).thenReturn(null);

        ResponseEntity<?> response =
rolController.createRol(rolDTO);

        assertSame(HttpStatus.BAD_REQUEST,
response.getStatusCode());
        assertEquals("Message: The role already exists",
response.getBody());

        verify(rolService).createRol(rolDTO);
        verifyNoMoreInteractions(rolService);
    }

    @Test
    void testUpdateRol_ExistingRol_ReturnsUpdatedRol() {
        RolDTO rolDTO = new RolDTO();
        rolDTO.setId(1L);
        rolDTO.setName("Admin");

        when(rolService.modifyRol(rolDTO)).thenReturn(rolDTO);
```

```
        ResponseEntity<?> response =
rolController.updateRol(rolDTO);

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertSame(rolDTO, response.getBody());

        verify(rolService).modifyRol(rolDTO);
        verifyNoMoreInteractions(rolService);
    }

    @Test
    void testUpdateRol_NonExistingRol_ReturnsNotFound() {
        RolDTO rolDTO = new RolDTO();
        rolDTO.setId(1L);
        rolDTO.setName("Admin");

        when(rolService.modifyRol(rolDTO)).thenReturn(null);

        ResponseEntity<?> response =
rolController.updateRol(rolDTO);

        assertSame(HttpStatus.NOT_FOUND,
response.getStatusCode());
        assertEquals("Message: The role " + rolDTO.getId() + "
does not exist", response.getBody());

        verify(rolService).modifyRol(rolDTO);
        verifyNoMoreInteractions(rolService);
    }

    @Test
    void testRemoveRol_ExistingRol_ReturnsSuccessMessage() {
        Long id = 1L;

        when(rolService.removeRol(id)).thenReturn(true);

        ResponseEntity<?> response = rolController.removeRol(id);

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertEquals("Message: Role was delete",
response.getBody());

        verify(rolService).removeRol(id);
        verifyNoMoreInteractions(rolService);
    }

    @Test
    void testRemoveRol_NonExistingRol_ReturnsNotFound() {
        Long id = 1L;

        when(rolService.removeRol(id)).thenReturn(false);
```

```
        ResponseEntity<?> response = rolController.removeRol(id);

        assertSame(HttpStatus.NOT_FOUND,
response.getStatusCode());
        assertEquals("Message: The role " + id + " does not
exist", response.getBody());

        verify(rolService).removeRol(id);
        verifyNoMoreInteractions(rolService);
    }
}
```




```
package com.grupo9.digitalBooking.music.controllerTest;
import static org.junit.jupiter.api.Assertions.assertEquals;
import static org.junit.jupiter.api.Assertions.assertSame;
import static org.mockito.Mockito.*;

import java.util.HashSet;
import java.util.Set;

import
com.grupo9.digitalBooking.music.model.controller.BrandController;
import org.junit.jupiter.api.BeforeEach;
import org.junit.jupiter.api.Test;
import org.mockito.InjectMocks;
import org.mockito.Mock;
import org.mockito.MockitoAnnotations;
import org.springframework.http.HttpStatus;
import org.springframework.http.ResponseEntity;

import com.grupo9.digitalBooking.music.model.DTO.BrandDTO;
import
com.grupo9.digitalBooking.music.model.service.InterfacesService.IB
randService;
```

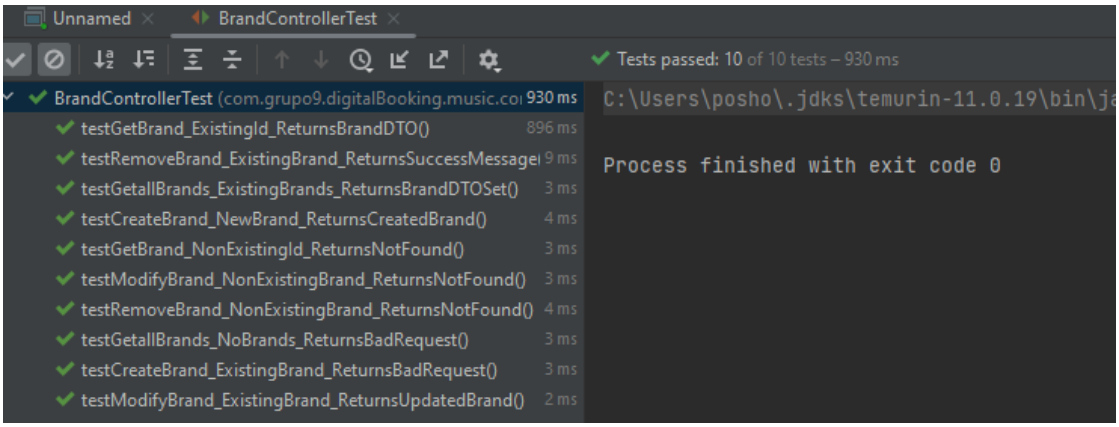
```
class BrandControllerTest {

    @Mock
    private IBrandService brandService;

    @InjectMocks
    private BrandController brandController;

    @BeforeEach
    void setUp() {
        MockitoAnnotations.openMocks(this);
    }

    @Test
    void testCreateBrand_NewBrand_ReturnsCreatedBrand() {
        BrandDTO brandDTO = new BrandDTO();
        brandDTO.setId(1L);
        brandDTO.setName("Brand 1");
        brandDTO.setImage("brand1.png");


when(brandService.createBrand(brandDTO)).thenReturn(brandDTO);

        ResponseEntity<?> response =
brandController.createBrand(brandDTO);

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertSame(brandDTO, response.getBody());

        verify(brandService).createBrand(brandDTO);
        verifyNoMoreInteractions(brandService);
    }

    @Test
    void testCreateBrand_ExistingBrand_ReturnsBadRequest() {
        BrandDTO brandDTO = new BrandDTO();
        brandDTO.setId(1L);
        brandDTO.setName("Brand 1");
        brandDTO.setImage("brand1.png");

        when(brandService.createBrand(brandDTO)).thenReturn(null);

        ResponseEntity<?> response =
brandController.createBrand(brandDTO);

        assertSame(HttpStatus.BAD_REQUEST,
response.getStatusCode());
        assertEquals("Message: The Brand already exists",
response.getBody());

        verify(brandService).createBrand(brandDTO);
        verifyNoMoreInteractions(brandService);
```

```
    }

    @Test
    void testGetBrand_ExistingId_ReturnsBrandDTO() {
        Long id = 1L;
        BrandDTO brandDTO = new BrandDTO();
        brandDTO.setId(id);
        brandDTO.setName("Brand 1");
        brandDTO.setImage("brand1.png");

        when(brandService.readBrand(id)).thenReturn(brandDTO);

        ResponseEntity<?> response = brandController.getBrand(id);

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertSame(brandDTO, response.getBody());

        verify(brandService).readBrand(id);
        verifyNoMoreInteractions(brandService);
    }

    @Test
    void testGetBrand_NonExistingId_ReturnsNotFound() {
        Long id = 1L;

        when(brandService.readBrand(id)).thenReturn(null);

        ResponseEntity<?> response = brandController.getBrand(id);

        assertSame(HttpStatus.BAD_REQUEST,
response.getStatusCode());
        assertEquals("Message: The Brand with " + id + " does not
exist", response.getBody());

        verify(brandService).readBrand(id);
        verifyNoMoreInteractions(brandService);
    }

    @Test
    void testModifyBrand_ExistingBrand_ReturnsUpdatedBrand() {
        BrandDTO brandDTO = new BrandDTO();
        brandDTO.setId(1L);
        brandDTO.setName("Brand 1");
        brandDTO.setImage("brand1.png");


when(brandService.modifyBrand(brandDTO)).thenReturn(brandDTO);

        ResponseEntity<?> response =
brandController.modifyBrand(brandDTO);

        assertSame(HttpStatus.OK, response.getStatusCode());
```

```
        assertSame(brandDTO, response.getBody());

        verify(brandService).modifyBrand(brandDTO);
        verifyNoMoreInteractions(brandService);
    }

    @Test
    void testModifyBrand_NonExistingBrand_ReturnsNotFound() {
        BrandDTO brandDTO = new BrandDTO();
        brandDTO.setId(1L);
        brandDTO.setName("Brand 1");
        brandDTO.setImage("brand1.png");

        when(brandService.modifyBrand(brandDTO)).thenReturn(null);

        ResponseEntity<?> response =
brandController.modifyBrand(brandDTO);

        assertSame(HttpStatus.BAD_REQUEST,
response.getStatusCode());
        assertEquals("Message: The Brand with " + brandDTO.getId()
+ " does not exist", response.getBody());

        verify(brandService).modifyBrand(brandDTO);
        verifyNoMoreInteractions(brandService);
    }

    @Test
    void testRemoveBrand_ExistingBrand_ReturnsSuccessMessage() {
        Long id = 1L;

        when(brandService.removeBrand(id)).thenReturn(true);

        ResponseEntity<?> response =
brandController.removeBrand(id);

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertEquals("Message: Brand was delete",
response.getBody());

        verify(brandService).removeBrand(id);
        verifyNoMoreInteractions(brandService);
    }

    @Test
    void testRemoveBrand_NonExistingBrand_ReturnsNotFound() {
        Long id = 1L;

        when(brandService.removeBrand(id)).thenReturn(false);

        ResponseEntity<?> response =
brandController.removeBrand(id);
```

```
        assertSame(HttpStatus.BAD_REQUEST,
response.getStatusCode());
        assertEquals("Message: The Brand with " + id + " does not
exist", response.getBody());

        verify(brandService).removeBrand(id);
        verifyNoMoreInteractions(brandService);
    }

    @Test
    void testGetallBrands_ExistingBrands_ReturnsBrandDTOSet() {
        Set<BrandDTO> brands = new HashSet<>();
        BrandDTO brand1 = new BrandDTO();
        brand1.setId(1L);
        brand1.setName("Brand 1");
        brand1.setImage("brand1.png");
        BrandDTO brand2 = new BrandDTO();
        brand2.setId(2L);
        brand2.setName("Brand 2");
        brand2.setImage("brand2.png");
        brands.add(brand1);
        brands.add(brand2);

        when(brandService.getAll()).thenReturn(brands);

        ResponseEntity<?> response =
brandController.getallBrands();

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertSame(brands, response.getBody());

        verify(brandService).getAll();
        verifyNoMoreInteractions(brandService);
    }

    @Test
    void testGetallBrands_NoBrands_ReturnsBadRequest() {
        Set<BrandDTO> brands = new HashSet<>();

        when(brandService.getAll()).thenReturn(brands);

        ResponseEntity<?> response =
brandController.getallBrands();

        assertSame(HttpStatus.BAD_REQUEST,
response.getStatusCode());
        assertEquals("Message: There are not information",
response.getBody());

        verify(brandService).getAll();
        verifyNoMoreInteractions(brandService);
```

```
    }
}
```




```
package com.grupo9.digitalBooking.music.controllerTest;
import static org.junit.jupiter.api.Assertions.assertEquals;
import static org.junit.jupiter.api.Assertions.assertSame;
import static org.mockito.Mockito.*;

import java.util.HashSet;
import java.util.Set;
import java.util.logging.Logger;

import
com.grupo9.digitalBooking.music.model.controller.StatusController;
import org.junit.jupiter.api.BeforeEach;
import org.junit.jupiter.api.Test;
import org.mockito.InjectMocks;
import org.mockito.Mock;
import org.mockito.MockitoAnnotations;
import org.springframework.http.HttpStatus;
import org.springframework.http.ResponseEntity;

import com.grupo9.digitalBooking.music.model.DTO.StatusDTO;
import
com.grupo9.digitalBooking.music.model.service.InterfacesService.IS
tatusService;

class StatusControllerTest {

    @Mock
    private IStatusService statusService;

    @InjectMocks
    private StatusController statusController;
```

```
    private static final Logger LOGGER =
Logger.getLogger(String.valueOf(StatusController.class));

    @BeforeEach
    void setUp() {
        MockitoAnnotations.openMocks(this);
    }

    @Test
    void testCreateStatus_NewStatus_ReturnsCreatedStatus() {
        StatusDTO statusDTO = new StatusDTO();
        statusDTO.setId(1L);
        statusDTO.setName("Status 1");


when(statusService.createStatus(statusDTO)).thenReturn(null);

        ResponseEntity<?> response =
statusController.createStatus(statusDTO);

        assertSame(HttpStatus.BAD_REQUEST,
response.getStatusCode());
        assertEquals("Message: The category already exists",
response.getBody());

        verify(statusService).createStatus(statusDTO);
        verifyNoMoreInteractions(statusService);
    }

    @Test
    void testCreateStatus_ExistingStatus_ReturnsBadRequest() {
        StatusDTO statusDTO = new StatusDTO();
        statusDTO.setId(1L);
        statusDTO.setName("Status 1");


when(statusService.createStatus(statusDTO)).thenReturn(null);

        ResponseEntity<?> response =
statusController.createStatus(statusDTO);

        assertSame(HttpStatus.BAD_REQUEST,
response.getStatusCode());
        assertEquals("Message: The category already exists",
response.getBody());

        verify(statusService).createStatus(statusDTO);
        verifyNoMoreInteractions(statusService);
    }

    @Test
```

```
    void testGetStatus_ExistingId_ReturnsStatusDTO() {
        Long id = 1L;
        StatusDTO statusDTO = new StatusDTO();
        statusDTO.setId(id);
        statusDTO.setName("Status 1");

        when(statusService.readStatus(id)).thenReturn(statusDTO);

        ResponseEntity<?> response =
statusController.getStatus(id);

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertSame(statusDTO, response.getBody());

        verify(statusService).readStatus(id);
        verifyNoMoreInteractions(statusService);
    }

    @Test
    void testGetStatus_NonExistingId_ReturnsNotFound() {
        Long id = 1L;

        when(statusService.readStatus(id)).thenReturn(null);

        ResponseEntity<?> response =
statusController.getStatus(id);

        assertSame(HttpStatus.BAD_REQUEST,
response.getStatusCode());
        assertEquals("Message: The status with " + id + " does not
exist", response.getBody());

        verify(statusService).readStatus(id);
        verifyNoMoreInteractions(statusService);
    }

    @Test
    void testModifyStatus_ExistingStatus_ReturnsUpdatedStatus() {
        StatusDTO statusDTO = new StatusDTO();
        statusDTO.setId(1L);
        statusDTO.setName("Status 1");


when(statusService.modifyStatus(statusDTO)).thenReturn(statusDTO);

        ResponseEntity<?> response =
statusController.modifyStatus(statusDTO);

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertSame(statusDTO, response.getBody());

        verify(statusService).modifyStatus(statusDTO);
```

```
        verifyNoMoreInteractions(statusService);
    }

    @Test
    void testModifyStatus_NonExistingStatus_ReturnsNotFound() {
        StatusDTO statusDTO = new StatusDTO();
        statusDTO.setId(1L);
        statusDTO.setName("Status 1");


when(statusService.modifyStatus(statusDTO)).thenReturn(null);

        ResponseEntity<?> response =
statusController.modifyStatus(statusDTO);

        assertSame(HttpStatus.NOT_FOUND,
response.getStatusCode());
        assertEquals("Message: The status " + statusDTO.getId() +
" does not exist", response.getBody());

        verify(statusService).modifyStatus(statusDTO);
        verifyNoMoreInteractions(statusService);
    }

    @Test
    void testRemoveStatus_ExistingStatus_ReturnsSuccessMessage() {
        Long id = 1L;

        when(statusService.removeStatus(id)).thenReturn(true);

        ResponseEntity<?> response =
statusController.removeStatus(id);

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertEquals("Message: Status was delete",
response.getBody());

        verify(statusService).removeStatus(id);
        verifyNoMoreInteractions(statusService);
    }

    @Test
    void testRemoveStatus_NonExistingStatus_ReturnsNotFound() {
        Long id = 1L;

        when(statusService.removeStatus(id)).thenReturn(false);

        ResponseEntity<?> response =
statusController.removeStatus(id);

        assertSame(HttpStatus.NOT_FOUND,
response.getStatusCode());
```

```
        assertEquals("Message: The category " + id + " does not
exist", response.getBody());

        verify(statusService).removeStatus(id);
        verifyNoMoreInteractions(statusService);
    }

    @Test
    void testGetallStatus_ExistingStatus_ReturnsStatusDTOSet() {
        Set<StatusDTO> statuses = new HashSet<>();
        StatusDTO status1 = new StatusDTO();
        status1.setId(1L);
        status1.setName("Status 1");
        StatusDTO status2 = new StatusDTO();
        status2.setId(2L);
        status2.setName("Status 2");
        statuses.add(status1);
        statuses.add(status2);

        when(statusService.getAll()).thenReturn(statuses);

        ResponseEntity<?> response =
statusController.getallStatus();

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertSame(statuses, response.getBody());

        verify(statusService).getAll();
        verifyNoMoreInteractions(statusService);
    }

    @Test
    void testGetallStatus_NoStatus_ReturnsBadRequest() {
        Set<StatusDTO> statuses = new HashSet<>();

        when(statusService.getAll()).thenReturn(statuses);

        ResponseEntity<?> response =
statusController.getallStatus();

        assertSame(HttpStatus.BAD_REQUEST,
response.getStatusCode());
        assertEquals("Message: There are not information",
response.getBody());

        verify(statusService).getAll();
        verifyNoMoreInteractions(statusService);
    }
}
```

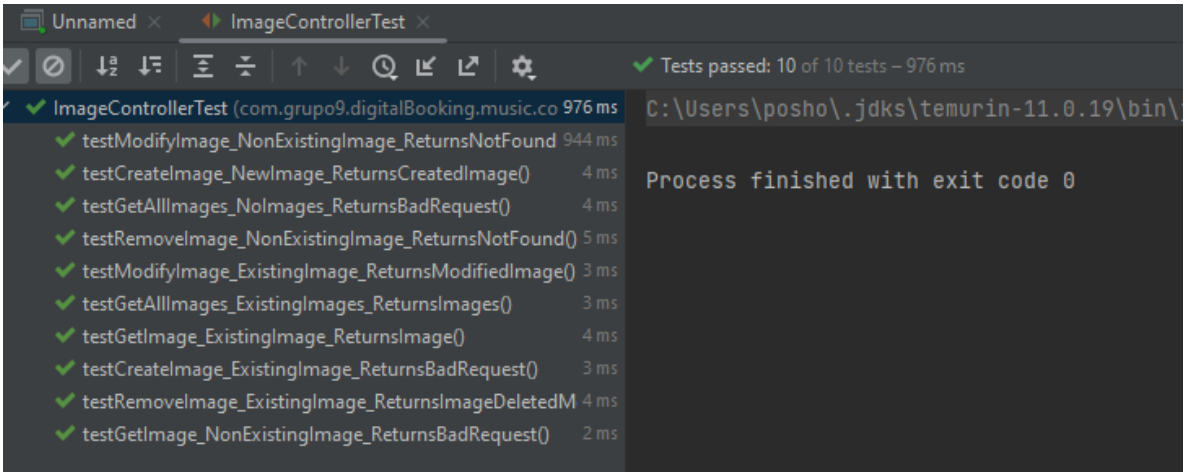

```java
package com.grupo9.digitalBooking.music.controllerTest;
import static org.junit.jupiter.api.Assertions.*;
import static org.mockito.Mockito.*;

import java.util.HashSet;
import java.util.Set;

import
com.grupo9.digitalBooking.music.model.controller.ImageController;
import org.junit.jupiter.api.BeforeEach;
import org.junit.jupiter.api.Test;
import org.mockito.InjectMocks;
import org.mockito.Mock;
import org.mockito.MockitoAnnotations;
import org.springframework.http.HttpStatus;
import org.springframework.http.ResponseEntity;

import com.grupo9.digitalBooking.music.model.DTO.ImageDTO;
import
com.grupo9.digitalBooking.music.model.service.InterfacesService.II
mageService;

class ImageControllerTest {

    @Mock
    private IImageService imageService;

    @InjectMocks
    private ImageController imageController;

    @BeforeEach
    void setUp() {
        MockitoAnnotations.openMocks(this);
    }

    @Test
    void testCreateImage_NewImage_ReturnsCreatedImage() {
        ImageDTO imageDTO = new ImageDTO();
        imageDTO.setId(1L);
        imageDTO.setName("Image 1");
        imageDTO.setUrl("https://example.com/image1.jpg");
```

```
when(imageService.createImage(imageDTO)).thenReturn(imageDTO);

        ResponseEntity<?> response =
imageController.createImage(imageDTO);

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertSame(imageDTO, response.getBody());

        verify(imageService).createImage(imageDTO);
        verifyNoMoreInteractions(imageService);
    }

    @Test
    void testCreateImage_ExistingImage_ReturnsBadRequest() {
        ImageDTO imageDTO = new ImageDTO();
        imageDTO.setId(1L);
        imageDTO.setName("Image 1");
        imageDTO.setUrl("https://example.com/image1.jpg");

        when(imageService.createImage(imageDTO)).thenReturn(null);

        ResponseEntity<?> response =
imageController.createImage(imageDTO);

        assertSame(HttpStatus.BAD_REQUEST,
response.getStatusCode());
        assertEquals("Message: The image already exists",
response.getBody());

        verify(imageService).createImage(imageDTO);
        verifyNoMoreInteractions(imageService);
    }

    @Test
    void testGetImage_ExistingImage_ReturnsImage() {
        ImageDTO imageDTO = new ImageDTO();
        imageDTO.setId(1L);
        imageDTO.setName("Image 1");
        imageDTO.setUrl("https://example.com/image1.jpg");

        when(imageService.readImage(1L)).thenReturn(imageDTO);

        ResponseEntity<?> response = imageController.getImage(1L);

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertSame(imageDTO, response.getBody());

        verify(imageService).readImage(1L);
        verifyNoMoreInteractions(imageService);
    }
```

```
    @Test
    void testGetImage_NonExistingImage_ReturnsBadRequest() {
        when(imageService.readImage(1L)).thenReturn(null);

        ResponseEntity<?> response = imageController.getImage(1L);

        assertSame(HttpStatus.BAD_REQUEST,
response.getStatusCode());
        assertEquals("Message: The image with 1 does not exist",
response.getBody());

        verify(imageService).readImage(1L);
        verifyNoMoreInteractions(imageService);
    }

    @Test
    void testModifyImage_ExistingImage_ReturnsModifiedImage() {
        ImageDTO imageDTO = new ImageDTO();
        imageDTO.setId(1L);
        imageDTO.setName("Image 1");
        imageDTO.setUrl("https://example.com/image1.jpg");


when(imageService.modifyImage(imageDTO)).thenReturn(imageDTO);

        ResponseEntity<?> response =
imageController.modifyImage(imageDTO);

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertEquals("Message: Image 1 was update",
response.getBody());

        verify(imageService).modifyImage(imageDTO);
        verifyNoMoreInteractions(imageService);
    }

    @Test
    void testModifyImage_NonExistingImage_ReturnsNotFound() {
        ImageDTO imageDTO = new ImageDTO();
        imageDTO.setId(1L);
        imageDTO.setName("Image 1");
        imageDTO.setUrl("https://example.com/image1.jpg");

        when(imageService.modifyImage(imageDTO)).thenReturn(null);

        ResponseEntity<?> response =
imageController.modifyImage(imageDTO);

        assertSame(HttpStatus.NOT_FOUND,
response.getStatusCode());
        assertEquals("Message: The image 1 does not exist",
```

```
response.getBody());

        verify(imageService).modifyImage(imageDTO);
        verifyNoMoreInteractions(imageService);
    }

    @Test
    void
testRemoveImage_ExistingImage_ReturnsImageDeletedMessage() {
        when(imageService.removeImage(1L)).thenReturn(true);

        ResponseEntity<?> response =
imageController.removeImage(1L);

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertEquals("Message: Image was delete",
response.getBody());

        verify(imageService).removeImage(1L);
        verifyNoMoreInteractions(imageService);
    }

    @Test
    void testRemoveImage_NonExistingImage_ReturnsNotFound() {
        when(imageService.removeImage(1L)).thenReturn(false);

        ResponseEntity<?> response =
imageController.removeImage(1L);

        assertSame(HttpStatus.NOT_FOUND,
response.getStatusCode());
        assertEquals("Message: The image 1 does not exist",
response.getBody());

        verify(imageService).removeImage(1L);
        verifyNoMoreInteractions(imageService);
    }

    @Test
    void testGetAllImages_ExistingImages_ReturnsImages() {
        Set<ImageDTO> images = new HashSet<>();
        ImageDTO imageDTO1 = new ImageDTO();
        imageDTO1.setId(1L);
        imageDTO1.setName("Image 1");
        imageDTO1.setUrl("https://example.com/image1.jpg");
        ImageDTO imageDTO2 = new ImageDTO();
        imageDTO2.setId(2L);
        imageDTO2.setName("Image 2");
        imageDTO2.setUrl("https://example.com/image2.jpg");
        images.add(imageDTO1);
        images.add(imageDTO2);
```

```
        when(imageService.getAll()).thenReturn(images);

        ResponseEntity<?> response =
imageController.getallImages();

        assertSame(HttpStatus.OK, response.getStatusCode());
        assertSame(images, response.getBody());

        verify(imageService).getAll();
        verifyNoMoreInteractions(imageService);
    }

    @Test
    void testGetAllImages_NoImages_ReturnsBadRequest() {
        Set<ImageDTO> images = new HashSet<>();

        when(imageService.getAll()).thenReturn(images);

        ResponseEntity<?> response =
imageController.getallImages();

        assertSame(HttpStatus.BAD_REQUEST,
response.getStatusCode());
        assertEquals("Message: There are not information",
response.getBody());

        verify(imageService).getAll();
        verifyNoMoreInteractions(imageService);
    }
}
```

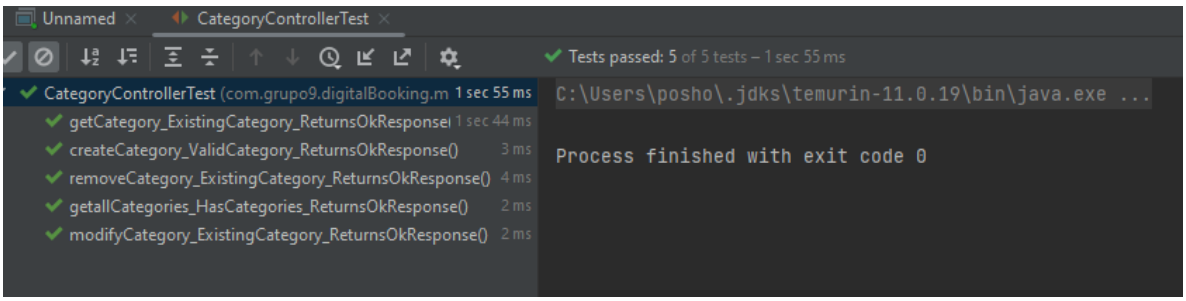


```java
package com.grupo9.digitalBooking.music.controllerTest;

import com.grupo9.digitalBooking.music.model.DTO.CategoryDTO;
import
com.grupo9.digitalBooking.music.model.controller.CategoryControlle
r;
import
com.grupo9.digitalBooking.music.model.service.InterfacesService.IC
ategoryService;
import org.junit.jupiter.api.BeforeEach;
import org.junit.jupiter.api.Test;
import org.mockito.InjectMocks;
import org.mockito.Mock;
import org.mockito.MockitoAnnotations;
import org.springframework.http.HttpStatus;
import org.springframework.http.ResponseEntity;

import java.util.HashSet;
import java.util.Set;

import static org.junit.jupiter.api.Assertions.assertEquals;
import static org.mockito.Mockito.*;

class CategoryControllerTest {

    @Mock
    private ICategoryService categoryService;

    @InjectMocks
    private CategoryController categoryController;

    @BeforeEach
    void setUp() {
        MockitoAnnotations.openMocks(this);
    }

    @Test
    void createCategory_ValidCategory_ReturnsOkResponse() {
        // Arrange
        CategoryDTO categoryDTO = new CategoryDTO();
        categoryDTO.setName("Test Category");
        categoryDTO.setDescription("Test Description");
        categoryDTO.setImage("http://example.com/image.jpg");


when(categoryService.createCategory(categoryDTO)).thenReturn(categ
oryDTO);

        // Act
        ResponseEntity<?> response =
categoryController.createCategory(categoryDTO);
```

```
        // Assert
        assertEquals(HttpStatus.OK, response.getStatusCode());
        assertEquals(categoryDTO, response.getBody());

        verify(categoryService,
times(1)).createCategory(categoryDTO);
    }

    @Test
    void getCategory_ExistingCategory_ReturnsOkResponse() {
        // Arrange
        Long categoryId = 1L;
        CategoryDTO categoryDTO = new CategoryDTO();
        categoryDTO.setId(categoryId);
        categoryDTO.setName("Test Category");
        categoryDTO.setDescription("Test Description");
        categoryDTO.setImage("http://example.com/image.jpg");


when(categoryService.readCategory(categoryId)).thenReturn(category
DTO);

        // Act
        ResponseEntity<?> response =
categoryController.getCategory(categoryId);

        // Assert
        assertEquals(HttpStatus.OK, response.getStatusCode());
        assertEquals(categoryDTO, response.getBody());

        verify(categoryService,
times(1)).readCategory(categoryId);
    }

    @Test
    void modifyCategory_ExistingCategory_ReturnsOkResponse() {
        // Arrange
        CategoryDTO categoryDTO = new CategoryDTO();
        categoryDTO.setId(1L);
        categoryDTO.setName("Test Category");
        categoryDTO.setDescription("Test Description");
        categoryDTO.setImage("http://example.com/image.jpg");


when(categoryService.modifyCategory(categoryDTO)).thenReturn(categ
oryDTO);

        // Act
        ResponseEntity<?> response =
categoryController.modifyCategory(categoryDTO);

        // Assert
```

```
        assertEquals(HttpStatus.OK, response.getStatusCode());
        assertEquals(categoryDTO, response.getBody());

        verify(categoryService,
times(1)).modifyCategory(categoryDTO);
    }

    @Test
    void removeCategory_ExistingCategory_ReturnsOkResponse() {
        // Arrange
        Long categoryId = 1L;


when(categoryService.removeCategory(categoryId)).thenReturn(true);

        // Act
        ResponseEntity<?> response =
categoryController.removeCategory(categoryId);

        // Assert
        assertEquals(HttpStatus.OK, response.getStatusCode());
        assertEquals("Message: Category was delete",
response.getBody());

        verify(categoryService,
times(1)).removeCategory(categoryId);
    }

    @Test
    void getallCategories_HasCategories_ReturnsOkResponse() {
        // Arrange
        CategoryDTO categoryDTO1 = new CategoryDTO();
        categoryDTO1.setId(1L);
        categoryDTO1.setName("Category 1");
        categoryDTO1.setDescription("Description 1");
        categoryDTO1.setImage("http://example1.com/image1.jpg");

        CategoryDTO categoryDTO2 = new CategoryDTO();
        categoryDTO2.setId(2L);
        categoryDTO2.setName("Category 2");
        categoryDTO2.setDescription("Description 2");
        categoryDTO2.setImage("http://example2.com/image2.jpg");

        Set<CategoryDTO> categories = new HashSet<>();
        categories.add(categoryDTO1);
        categories.add(categoryDTO2);

        when(categoryService.getAll()).thenReturn(categories);

        // Act
        ResponseEntity<?> response =
categoryController.getallCategories();
```

```
        // Assert
        assertEquals(HttpStatus.OK, response.getStatusCode());
        assertEquals(categories, response.getBody());

        verify(categoryService, times(1)).getAll();
    }
}
```




```
package com.grupo9.digitalBooking.music.controllerTest;

import com.grupo9.digitalBooking.music.model.DTO.InstrumentDetailDTO;
import
com.grupo9.digitalBooking.music.model.controller.InstrumentDetailControll
er;
import
com.grupo9.digitalBooking.music.model.service.InterfacesService.IInstrume
ntDetailService;
import org.junit.jupiter.api.BeforeEach;
import org.junit.jupiter.api.Test;
import org.mockito.InjectMocks;
import org.mockito.Mock;
import org.mockito.MockitoAnnotations;
import org.springframework.http.HttpStatus;
import org.springframework.http.ResponseEntity;

import java.util.HashSet;
import java.util.Set;

import static org.junit.jupiter.api.Assertions.assertEquals;
import static org.mockito.Mockito.*;

public class InstrumentDetailControllerTest {
    @Mock
    private IInstrumentDetailService instrumentDetailService;

    @InjectMocks
    private InstrumentDetailController instrumentDetailController;

    @BeforeEach
    public void setup() {
        MockitoAnnotations.openMocks(this);
    }
```

```
    @Test
    public void testCreateInstrumentDetail() {
        InstrumentDetailDTO instrumentDetailDTO = new
InstrumentDetailDTO();
        instrumentDetailDTO.setId(1L);
        instrumentDetailDTO.setDescription("Test description");

        ResponseEntity<?> responseEntity =
instrumentDetailController.createInstrumentDetail(instrumentDetailDTO);

        verify(instrumentDetailService,
times(1)).createInstrumentDetail(instrumentDetailDTO);
        assertEquals(HttpStatus.OK, responseEntity.getStatusCode());
    }

    @Test
    public void testGetInstrumentDetail() {
        Long id = 1L;
        InstrumentDetailDTO instrumentDetailDTO = new
InstrumentDetailDTO();
        instrumentDetailDTO.setId(id);
        instrumentDetailDTO.setDescription("Test description");


when(instrumentDetailService.readInstrumentDetail(id)).thenReturn(instrum
entDetailDTO);

        InstrumentDetailDTO result =
instrumentDetailController.getInstrumentDetail(id);

        verify(instrumentDetailService,
times(1)).readInstrumentDetail(id);
        assertEquals(instrumentDetailDTO, result);
    }

    @Test
    public void testModifyInstrumentDetail() {
        InstrumentDetailDTO instrumentDetailDTO = new
InstrumentDetailDTO();
        instrumentDetailDTO.setId(1L);
        instrumentDetailDTO.setDescription("Test description");

        ResponseEntity<?> responseEntity =
instrumentDetailController.modifyInstrumentDetail(instrumentDetailDTO);

        verify(instrumentDetailService,
times(1)).modifyInstrumentDetail(instrumentDetailDTO);
        assertEquals(HttpStatus.OK, responseEntity.getStatusCode());
    }

    @Test
    public void testRemoveInstrumentDetail() {
        Long id = 1L;

        ResponseEntity<?> responseEntity =
instrumentDetailController.removeInstrumentDetail(id);
```

```
        verify(instrumentDetailService,
times(1)).removeInstrumentDetail(id);
        assertEquals(HttpStatus.OK, responseEntity.getStatusCode());
    }

    @Test
    public void testGetAllInstrumentDetails() {
        Set<InstrumentDetailDTO> instrumentDetailDTOSet = new
HashSet<>();
        InstrumentDetailDTO instrumentDetailDTO1 = new
InstrumentDetailDTO();
        instrumentDetailDTO1.setId(1L);
        instrumentDetailDTO1.setDescription("Test description 1");
        InstrumentDetailDTO instrumentDetailDTO2 = new
InstrumentDetailDTO();
        instrumentDetailDTO2.setId(2L);
        instrumentDetailDTO2.setDescription("Test description 2");
        instrumentDetailDTOSet.add(instrumentDetailDTO1);
        instrumentDetailDTOSet.add(instrumentDetailDTO2);


when(instrumentDetailService.getAll()).thenReturn(instrumentDetailDTOSet)
;

        Set<InstrumentDetailDTO> result = (Set<InstrumentDetailDTO>)
instrumentDetailController.getAllInstrumentDetails();

        verify(instrumentDetailService, times(1)).getAll();
        assertEquals(instrumentDetailDTOSet, result);
    }
}
```