**Shared Setup: User Entity & Repository**

**User.java**

import jakarta.persistence.Entity;

import jakarta.persistence.Id;

@Entity

public class User {

@Id

private Long id;

private String name;

// Getters and Setters

}

**UserRepository.java**

import org.springframework.data.jpa.repository.JpaRepository;

public interface UserRepository extends JpaRepository<User, Long> {

}

**Exercise 1: Mocking Service in Controller Test**

**UserService.java**

import org.springframework.beans.factory.annotation.Autowired;

import org.springframework.stereotype.Service;

@Service

public class UserService {

@Autowired

private UserRepository userRepository;

public User getUserById(Long id) {

return userRepository.findById(id).orElse(null);

}

}

**UserController.java**

import org.springframework.beans.factory.annotation.Autowired;

import org.springframework.http.ResponseEntity;

import org.springframework.web.bind.annotation.\*;

@RestController

@RequestMapping("/users")

public class UserController {

@Autowired

private UserService userService;

@GetMapping("/{id}")

public ResponseEntity<User> getUser(@PathVariable Long id) {

return ResponseEntity.ok(userService.getUserById(id));

}

}

**UserControllerTest.java**

import org.junit.jupiter.api.Test;

import org.mockito.Mockito;

import org.springframework.boot.test.autoconfigure.web.servlet.WebMvcTest;

import org.springframework.boot.test.mock.mockito.MockBean;

import org.springframework.beans.factory.annotation.Autowired;

import org.springframework.test.web.servlet.MockMvc;

import static org.springframework.test.web.servlet.request.MockMvcRequestBuilders.get;

import static org.springframework.test.web.servlet.result.MockMvcResultMatchers.\*;

import static org.mockito.Mockito.when;

@WebMvcTest(UserController.class)

public class UserControllerTest {

@Autowired

private MockMvc mockMvc;

@MockBean

private UserService userService;

@Test

void testGetUser() throws Exception {

User user = new User();

user.setId(1L);

user.setName("Ashish");

when(userService.getUserById(1L)).thenReturn(user);

mockMvc.perform(get("/users/1"))

.andExpect(status().isOk())

.andExpect(jsonPath("$.name").value("Ashish"));

}

}

**Exercise 2: Mocking Repository in Service Test**

**UserServiceTest.java**

import static org.mockito.Mockito.\*;

import static org.junit.jupiter.api.Assertions.\*;

import java.util.Optional;

import org.junit.jupiter.api.Test;

import org.mockito.InjectMocks;

import org.mockito.Mock;

import org.mockito.MockitoAnnotations;

public class UserServiceTest {

@Mock

private UserRepository userRepository;

@InjectMocks

private UserService userService;

public UserServiceTest() {

MockitoAnnotations.openMocks(this);

}

@Test

void testGetUserById() {

User user = new User();

user.setId(1L);

user.setName("Ashish");

when(userRepository.findById(1L)).thenReturn(Optional.of(user));

User result = userService.getUserById(1L);

assertNotNull(result);

assertEquals("Ashish", result.getName());

}

}

**Exercise 3: Integration Test with Mocked Service**

**UserIntegrationTest.java**

import static org.mockito.Mockito.\*;

import org.junit.jupiter.api.Test;

import org.springframework.boot.test.context.SpringBootTest;

import org.springframework.boot.test.mock.mockito.MockBean;

import org.springframework.boot.test.autoconfigure.web.servlet.AutoConfigureMockMvc;

import org.springframework.beans.factory.annotation.Autowired;

import org.springframework.test.web.servlet.MockMvc;

import static org.springframework.test.web.servlet.request.MockMvcRequestBuilders.get;

import static org.springframework.test.web.servlet.result.MockMvcResultMatchers.\*;

@SpringBootTest

@AutoConfigureMockMvc

public class UserIntegrationTest {

@Autowired

private MockMvc mockMvc;

@MockBean

private UserService userService;

@Test

void testUserControllerWithMockedService() throws Exception {

User user = new User();

user.setId(1L);

user.setName("Ashish");

when(userService.getUserById(1L)).thenReturn(user);

mockMvc.perform(get("/users/1"))

.andExpect(status().isOk())

.andExpect(jsonPath("$.name").value("Ashish"));

}

}