

Chapter Six: Unit Testing

6.1 Purpose

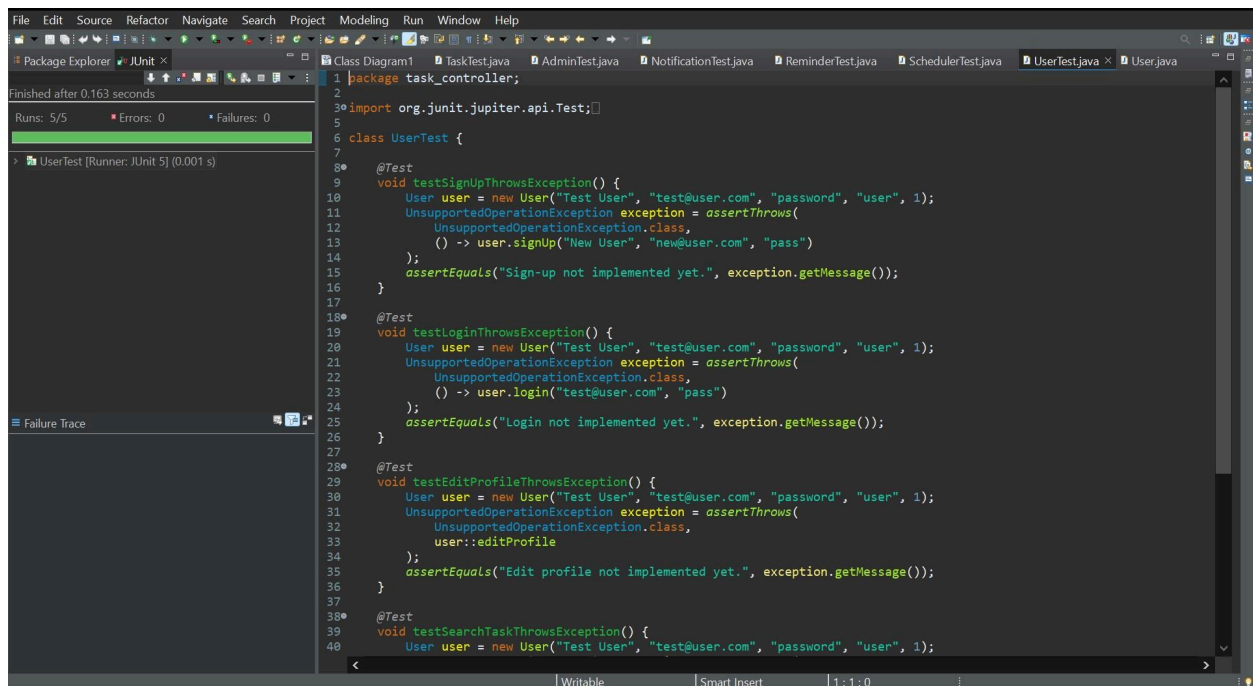
Unit testing is conducted to verify the correctness and reliability of key components within the Smart Task Controller, such as user login authentication, task creation functionality, and reminder setup processes. This step ensures that each module operates as intended before integration, reducing bugs and enhancing system stability.

6.2 Tools Used

This project utilizes **JUnit**, a widely adopted testing framework for Java. JUnit provides a set of annotations and assertions that enable developers to create and validate test cases effectively, ensuring code correctness and reliability throughout the development process. Additionally, the project is developed using the **Eclipse IDE**, which offers robust features for code writing, debugging, and seamless integration with JUnit.

6.3 Example Test Code

User Junit Test:



```
File Edit Source Refactor Navigate Search Project Modeling Run Window Help
Package Explorer JUnit x
Class Diagram1 TaskTest.java AdminTest.java NotificationTest.java ReminderTest.java SchedulerTest.java UserTest.java User.java
Finished after 0.163 seconds
Runs: 5/5 Errors: 0 Failures: 0
> UserTest [Runner: JUnit 5] (0.001 s)
1 package task_controller;
2
3 import org.junit.jupiter.api.Test;
4
5
6 class UserTest {
7
8     @Test
9     void testSignUpThrowsException() {
10         User user = new User("Test User", "test@user.com", "password", "user", 1);
11         UnsupportedOperationException exception = assertThrows(
12             UnsupportedOperationException.class,
13             () -> user.signUp("New User", "new@user.com", "pass")
14         );
15         assertEquals("Sign-up not implemented yet.", exception.getMessage());
16     }
17
18     @Test
19     void testLoginThrowsException() {
20         User user = new User("Test User", "test@user.com", "password", "user", 1);
21         UnsupportedOperationException exception = assertThrows(
22             UnsupportedOperationException.class,
23             () -> user.login("test@user.com", "pass")
24         );
25         assertEquals("Login not implemented yet.", exception.getMessage());
26     }
27
28     @Test
29     void testEditProfileThrowsException() {
30         User user = new User("Test User", "test@user.com", "password", "user", 1);
31         UnsupportedOperationException exception = assertThrows(
32             UnsupportedOperationException.class,
33             user::editProfile
34         );
35         assertEquals("Edit profile not implemented yet.", exception.getMessage());
36     }
37
38     @Test
39     void testSearchTaskThrowsException() {
40         User user = new User("Test User", "test@user.com", "password", "user", 1);
41     }
42 }
```

Task Junit Test:

```
1 package task_controller;
2
3 import java.time.LocalDateTime;
4
5 class TaskTest {
6
7     @Test
8     void testCreateTaskThrowsException() {
9         Task task = new Task(1, 1, "Title", "Desc", LocalDateTime.now(), "High", "Pending", "Work",
10             LocalDateTime.now(), LocalDateTime.now(), LocalDateTime.now());
11         UnsupportedOperationException exception = assertThrows(
12             UnsupportedOperationException.class,
13             () -> task.createTask(LocalDateTime.now())
14         );
15         assertTrue(exception instanceof UnsupportedOperationException);
16     }
17
18     @Test
19     void testEditTaskThrowsException() {
20         Task task = new Task(1, 1, "Title", "Desc", LocalDateTime.now(), "High", "Pending", "Work",
21             LocalDateTime.now(), LocalDateTime.now(), LocalDateTime.now());
22         UnsupportedOperationException exception = assertThrows(
23             UnsupportedOperationException.class,
24             () -> task.editTask(1, "New Title", "New Desc", LocalDateTime.now(), "Low", "Done", "Home")
25         );
26         assertTrue(exception instanceof UnsupportedOperationException);
27     }
28
29     @Test
30     void testDeleteTaskThrowsException() {
31         Task task = new Task(1, 1, "Title", "Desc", LocalDateTime.now(), "High", "Pending", "Work",
32             LocalDateTime.now(), LocalDateTime.now(), LocalDateTime.now());
33         UnsupportedOperationException exception = assertThrows(
34             UnsupportedOperationException.class,
35             () -> task.deleteTask(LocalDateTime.now(), LocalDateTime.now())
36         );
37         assertTrue(exception instanceof UnsupportedOperationException);
38     }
39 }
40
41
```

Reminder Junit Test:

