

assertEquals() method

This lesson demonstrates how to use assertEquals() method in JUnit 5 to assert test conditions.

WE'LL COVER THE FOLLOWING ^

- assertEquals() method
- Demo
- Class Under Test - StringUtils
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assertEquals() method

Assertions API provide static `assertEquals()` method. This method helps us in validating that actual and expected values are equal. This method uses `equals()` to assert the equality of actual and expected value.

- If the actual value is `equal` to expected value then the test case will pass.
- If the actual value is `not equal` to expected value then the test case will fail.

There are basically three useful overloaded methods for assertEquals:-

```
public static void assertEquals(Object expected, Object actual)
public static void assertEquals(Object expected, Object actual, String message)
public static void assertEquals(Object expected, Object actual, Supplier<String> messageSupplier)
```



1. `assertEquals(Object expected, Object actual)` - It asserts whether expected and actual value are equal.
2. `assertEquals(Object expected, Object actual, String message)` - It

asserts whether expected and actual value are equal. In case, if the

expected value is **not** equal to actual value then test case will fail with a provided message.

3. `assertEquals(Object expected, Object actual, Supplier<String> messageSupplier)` - It asserts whether expected and actual value are equal. In case, if the expected value is **not** equal to actual value then test case will fail with the provided message through Supplier function. The main advantage of using Supplier function is that it lazily evaluates to String only when the test case fails.

assertEquals method

Demo

Step 1 - Create a Java class in Eclipse as discussed in previous lessons.

Step 2 - Give it a name as, StringUtils.

 StringUtils.java

```
package com.hubberspot.junit5.assertions;
```



```

public class StringUtils {

    public static String reverse(String input) {

        if(input == null) {
            return null;
        }

        if(input.length() == 0) {
            return "";
        }

        char[] charArray = input.toCharArray();
        int start = 0;
        int end = input.length() - 1;

        while(start < end) {
            char temp = charArray[start];
            charArray[start] = charArray[end];
            charArray[end] = temp;
            start++;
            end--;
        }

        return new String(charArray);
    }

}

```

Class Under Test - StringUtils

StringUtils is our class under test. It has one method as, `reverse()`. This method takes in a String and returns reverse of it.

For example -

1. If we provide input String as, "ABCD", it returns back "DCBA".
2. If we provide input String as, "Student", it returns back "tnedutS".
3. If we provide input String as, **null**, it returns back **null**.
4. If we provide input String as, "", it returns back "" String.

Step 3 - Create a test class by name, "StringUtilsTest1". This test class will demonstrate all overloaded `assertEquals()` methods.



StringUtilsTest1.java

```

package com.hubberspot.junit5.assertions;

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

```



```

import java.util.function.Supplier;
import org.junit.jupiter.api.Test;

class StringUtilsTest1 {

    // ***** assertEquals Example - Start *****

    @Test
    void givenEmptyString_whenReverseIsCalled_thenEmptyStringIsReturned() {
        String actual = StringUtils.reverse("");
        String expected = "";

        // assertEquals without message
        assertEquals(expected, actual);
    }

    @Test
    void givenNonNullString_whenReverseIsCalled_thenReversedStringIsReturned() {
        String actual = StringUtils.reverse("ABCD");
        String expected = "DCBA";

        String message = "assertEquals failed";
        // assertEquals with message
        assertEquals(expected, actual, message);
    }

    @Test
    void givenNonNullString_whenReverseIsCalled_thenReversedStringIsReturned2() {
        String actual = StringUtils.reverse("1234");
        String expected = "4321";

        Supplier<String> messageSupplier = () -> "assertEquals failed";
        // assertEquals with Java 8 Supplier<String>
        assertEquals(expected, actual, messageSupplier);
    }

    // ***** assertEquals Example - End *****
}

```

StringUtilsTest1.java



StringUtils.java

```

package io.educative.junit5;

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

import java.util.function.Supplier;
import org.junit.jupiter.api.Test;

class StringUtilsTest1 {

    // ***** assertEquals Example - Start *****

    @Test
    void givenEmptyString_whenReverseIsCalled_thenEmptyStringIsReturned() {
        String actual = StringUtils.reverse("");
        String expected = "";
    }
}

```

```

        // assertEquals without message
        assertEquals(expected, actual);
    }

    @Test
    void givenNonNullString_whenReverseIsCalled_thenReversedStringIsReturned() {
        String actual = StringUtils.reverse(("ABCD"));
        String expected = "DCBA";

        String message = "assertEquals failed";
        // assertEquals with message
        assertEquals(expected, actual, message);
    }

    @Test
    void givenNonNullString_whenReverseIsCalled_thenReversedStringIsReturned2() {
        String actual = StringUtils.reverse(("1234"));
        String expected = "2314";

        Supplier<String> messageSupplier = () -> "assertEquals failed";
        // assertEquals with Java 8 Supplier<String>
        assertEquals(expected, actual, messageSupplier);
    }

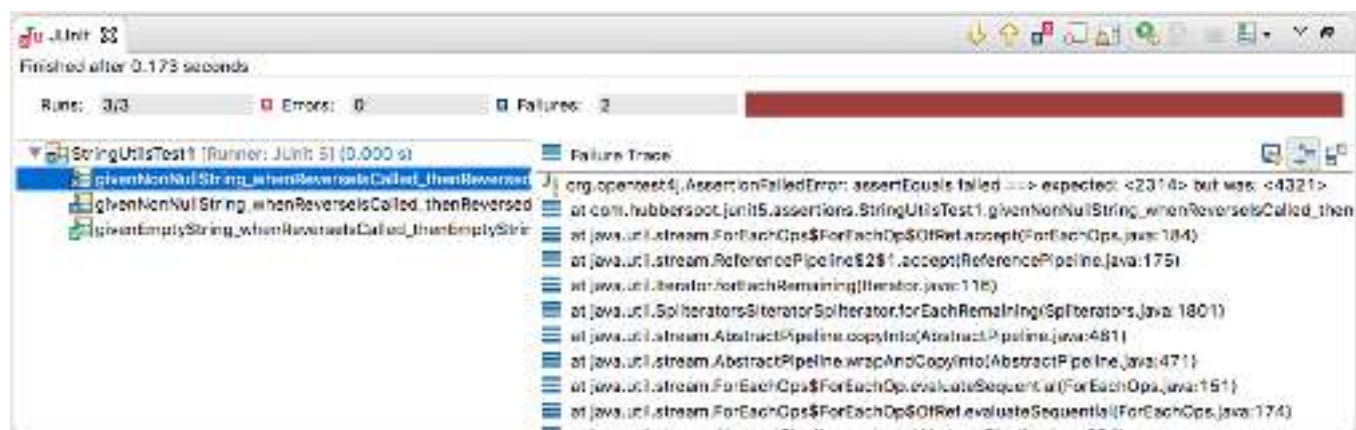
    // ***** assertEquals Example - End *****
}

```



Step 4 - Run StringUtilsTest1 class as Junit Test.

Output #



Explanation - #

The order of execution of test cases depends on Junit 5. In StringUtilsTest1 class, there are 3 @Test methods:-

1. `givenEmptyString_whenReverseIsCalled_thenEmptyStringIsReturned()` - It tests the scenario that when "" is provided to `reverse()` method of

tests the scenario that when `""` is provided to `reverse()` method of `StringUtils` class, then `""` is returned. Here, return value is empty string.

So, on **line 18** providing `assertEquals()` asserts that expected value and actual value returned are equal. Thus, it passes the Junit test case because our expected value which is `""` and actual value returned are equal.

2. `givenNonNullString_whenReverseIsCalled_thenReversedStringIsReturned` - It tests the scenario that when **ABCD** is provided to `reverse()` method of `StringUtils` class, then **DCBA** is returned. Here, return value is **DCBA**. So, on **line 28** providing `assertEquals()` asserts that expected value and actual value returned are equal. Thus, it fails the Junit test case because expected value is **DBCA** and actual value returned is **DCBA**.

In this test case, we are using overloaded `assertEquals()` method, which takes **String message** as second argument. As, this test case doesn't satisfy assertion condition, it fails and give "`AssertionFailedError: assertEquals failed ==> expected: <DBCA> but was: <DCBA>`".

3. `givenNonNullString_whenReverseIsCalled_thenReversedStringIsReturned2` - It tests the scenario that when **1234** is provided to `reverse()` method of `StringUtils` class, then **4321** is returned. Here, return value is **4321**. So, on **line 38** providing `assertEquals()` asserts that expected value and actual value returned are equal. Thus, it fails the Junit test case because expected value is **2314** and actual value returned is **4321**.

In this test case, we are using overloaded `assertEquals()` method, which takes `Supplier<String> messageSupplier` as second argument. As, this test case doesn't satisfy assertion condition, it fails and give "`AssertionFailedError: assertEquals failed ==> expected: <2314> but was: <4321>`". It gives `AssertionFailedError` followed by lazily evaluates **String message** we provide to `assertEquals()` method, as lambda expression.

Though the actual value above returned from `reverse()` method is correct, but even if we provide the wrong expected value test case will fail.

Below code will pass all above test cases.

StringUtilsTest1.java



```
package io.educative.junit5;

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

import java.util.function.Supplier;
import org.junit.jupiter.api.Test;

class StringUtilsTest1 {

    // ***** assertEquals Example - Start *****

    @Test
    void givenEmptyString_whenReverseIsCalled_thenEmptyStringIsReturned() {
        String actual = StringUtils.reverse("");
        String expected = "";

        // assertEquals without message
        assertEquals(expected, actual);
    }

    @Test
    void givenNonNullString_whenReverseIsCalled_thenReversedStringIsReturned() {
        String actual = StringUtils.reverse("ABCD");
        String expected = "DCBA";

        String message = "assertEquals failed";
        // assertEquals with message
        assertEquals(expected, actual, message);
    }

    @Test
    void givenNonNullString_whenReverseIsCalled_thenReversedStringIsReturned2() {
        String actual = StringUtils.reverse("1234");
        String expected = "4321";

        Supplier<String> messageSupplier = () -> "assertEquals failed";
        // assertEquals with Java 8 Supplier<String>
        assertEquals(expected, actual, messageSupplier);
    }

    // ***** assertEquals Example - End *****
}
```



You can perform code changes to above code widget, run and practice different outcomes.

In the next lesson, we will look into `assertNotEquals()` assertion.

