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TESTNG ASSERTION

Assertion

In general, the word **Assert** means "to state or declare something (a fact) confidently or positively or forcefully". Assertion in TestNG is one of the validation processes, during the test execution. It is used to compare the expected result vs actual result, based on certain conditions of the test and decide the result (pass or fail) of the test case.

Types of Assertion:

1. Hard Assertion
2. Soft Assertion

Hard Assertion:

Primarily, the general assertion is otherwise called as hard assertion. The **@test** method runs with an assertion statement to validate the result of the test case. If the assertion statement fails, it throws an assertion error "**java.lang.AssertionError**" and stops the execution. This can be handled with try… catch block.

Different types of hard assert with example:

1. **assertEquals():** This method will compare between two arguments, whether both the given arguments are equal or not. If both arguments are equal the testng will give passed status. assertEquals() method will compare different variables of different return types.

2. **assertNotEquals**(): This method will compare between two arguments, whether both the given arguments are equal or not. If both arguments are not equal the testng will give passed status. assertNotEquals() method will compare different variables of different return types. It is total opposite to assertEquals() method.

3. **assertTrue**(): This method is specially for Boolean conditions, we need to pass boolean type variable inside this method, so if the argument was true, test case will passed or it will fail the test case and throw **AssertionError**. isDisplayed(), isSelected(), isEnabled() methods are mostly used for browser verification using this type.

4. **assertFalse**(): This method is also specially for Boolean conditions, we need to pass boolean type variable inside this method, so if the argument was false, test case will passed or it will fail the test case and throw AssertionError. isDisplayed(), isSelected(), isEnabled() methods are mostly used for browser verification using this type. It is total opposite to assertFalse() method.

TESTNG ASSERTION

Code for assertEquals():

- If both arguments are equal the testng will give passed status,

```java
public ChromeDriver driver;
@BeforeMethod
public void launchBrowser() {
    WebDriverManager.chromedriver().setup();
    driver = new ChromeDriver();
    driver.manage().window().maximize();
    driver.manage().timeouts().implicitlyWait(Duration.ofSeconds(5));
}
@Test
public void testHardAssertion() {
    driver.get("http://leaftaps.com/opentaps/control/login");
    String actualTitle = driver.getTitle();
    String expectedTitle ="Leaftaps - TestLeaf Automation Platform";
    Assert.assertEquals(actualTitle, expectedTitle);

    }
@AfterMethod
public void closeBrowser() {
    driver.close();
}
```

Result:

```
PASSED: testHardAssertion


===============================================
    Default test
    Tests run: 1, Failures: 0, Skips: 0
===============================================
```

In the above example, inside testHardAssertion() the actual title of the webpage is stored in **actualTitle** variable and expected value given in **expectedTitle,** both the variables is passed inside assertEquals() method.

Both are same hence test case passed.

- If both arguments are not equal the testng will throw error,

```java
public ChromeDriver driver;
@BeforeMethod
public void launchBrowser() {
    WebDriverManager.chromedriver().setup();
    driver = new ChromeDriver();
    driver.manage().window().maximize();
    driver.manage().timeouts().implicitlyWait(Duration.ofSeconds(5));
}
@Test
public void testHardAssertion() {
    driver.get("http://leaftaps.com/opentaps/control/login");
    String actualTitle = driver.getTitle();
    String expectedTitle ="Leaftaps";
    Assert.assertEquals(actualTitle, expectedTitle);

    }
@AfterMethod
public void closeBrowser() {
    driver.close();
}
```

Result:

```
FAILED: testHardAssertion
java.lang.AssertionError: expected [Leaftaps] but found [Leaftaps - TestLeaf Automation Platform]
        at org.testng.Assert.fail(Assert.java:110)
        at org.testng.Assert.failNotEquals(Assert.java:1413)
        at org.testng.Assert.assertEqualsImpl(Assert.java:149)
        at org.testng.Assert.assertEquals(Assert.java:131)
        at org.testng.Assert.assertEquals(Assert.java:655)
        at org.testng.Assert.assertEquals(Assert.java:665)
        at assertlearning.AssertWithLeaftaps.testHardAssertion(AssertWithLeaftaps.java:29)
```

In the above example, both the values are not same hence FAILED and thrown **AssertionError**.

Code for assertTrue():

```java
public ChromeDriver driver;
@BeforeMethod
public void launchBrowser() {
    WebDriverManager.chromedriver().setup();
    driver = new ChromeDriver();
    driver.manage().window().maximize();
    driver.manage().timeouts().implicitlyWait(Duration.ofSeconds(5));
}
@Test
public void testHardAssertion() {
    driver.get("http://leaftaps.com/opentaps/control/login");
    boolean displayed = driver.findElement(By.xpath("//input[@type='submit']")).isDisplayed();
    Assert.assertTrue(displayed);
    }
@AfterMethod
public void closeBrowser() {
    driver.close();
}
```

Result:

```
PASSED: testHardAssertion

=============================================
    Default test
    Tests run: 1, Failures: 0, Skips: 0
=============================================
```

In the above code, using isDisplayed() method returns true value hence testcase passed. If the boolean value is false it will throw AssertionError.

Soft Assertion

Soft Assertion performs in such a manner, that collects all the errors using assertAll(), which does not interrupt the execution. assertAll() should be the last line of the testcase. If the tester wants to execute the without interruption even though assert fails the soft assertion can be used.

Different types of soft assert with example:

1. **assertEquals**()

2. **assertNotEquals**()

3. **assertTrue**()

4. **assertFalse**()

The above methods has the same functionality of the methods of hard asserts. assertAll() is only method need to include at end.

Code for Soft Assert:

```
public ChromeDriver driver;
@BeforeMethod
public void launchBrowser() {
    WebDriverManager.chromedriver().setup();
    driver = new ChromeDriver();
    driver.manage().window().maximize();
    driver.manage().timeouts().implicitlyWait(Duration.ofSeconds(5));
}
@Test
public void testHardAssertion() {
    driver.get("http://leaftaps.com/opentaps/control/login");
    String actualTitle = driver.getTitle();
    String expectedTitle ="Leaftaps - TestLeaf Automation Platform";
    SoftAssert softAssert = new SoftAssert();
    softAssert.assertEquals(actualTitle, expectedTitle);//both the value should match
    softAssert.assertNotEquals(actualTitle, expectedTitle);//both the value should not match
    boolean displayed = driver.findElement(By.xpath("//input[@type='submit']")).isDisplayed();
    softAssert.assertTrue(displayed);// the value should be true
    softAssert.assertFalse(displayed); // the value should be false
    System.out.println("end of code");
    softAssert.assertAll();
    }
@AfterMethod
public void closeBrowser() {
    driver.close();
}
```

Result:

```
WARNING: Unable to find an exact match for CDP version 101, so returning the closest version found: 99
May 09, 2022 10:33:29 AM org.openqa.selenium.devtools.CdpVersionFinder findNearestMatch
INFO: Found CDP implementation for version 101 of 99
end of code
FAILED: testHardAssertion
java.lang.AssertionError: The following asserts failed:
        did not expect [Leaftaps - TestLeaf Automation Platform] but found [Leaftaps - TestLeaf Automation Platform],
        expected [false] but found [true]
        at org.testng.asserts.SoftAssert.assertAll(SoftAssert.java:46)
        at org.testng.asserts.SoftAssert.assertAll(SoftAssert.java:30)
        at assertlearning.AssertWithLeaftaps.testHardAssertion(AssertWithLeaftaps.java:35)
        at java.base/jdk.internal.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
```

In this above example, by using all above methods even though some assert fails, it got executed until softAssert.assertAll() and printed "end of code" without interruption.