# Testing Windows Applications using Appium and JUnit in Java

## Overview

In this tutorial, we will create a JUnit Test Case in Java, using the Appium library for automation of Windows applications.

## Description

The following automated test class validates the "Calculator" Windows native application using several methods (i.e., Tests) for validating each arithmetic operation.

> **Please note**
>
> This example is taken from the public Github repository https://github.com/Microsoft/WinAppDriver/tree/master/Samples/Java/CalculatorTest. It also provides examples for other languages.

## Requirement

- WinAppDriver must be running in the destination machine (i.e., the one having Windows and the "Calculator" application), or the Appium Desktop.

```
WinAppDriver.exe 192.168.56.102 4723
```

We will make a simple update to the pom.xml file in order to generate a JUnit xml report.

**pom.xml**

```
<project xmlns="http://maven.apache.org/POM/4.0.0"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>

    <groupId>CalculatorTest</groupId>
    <artifactId>CalculatorTest</artifactId>
    <version>1.0-SNAPSHOT</version>

    <dependencies>
        <dependency>
            <groupId>org.seleniumhq.selenium</groupId>
            <artifactId>selenium-java</artifactId>
            <version>3.3.1</version>
        </dependency>
        <dependency>
            <groupId>junit</groupId>
            <artifactId>junit</artifactId>
            <version>4.12</version>
        </dependency>
        <dependency>
            <groupId>io.appium</groupId>
            <artifactId>java-client</artifactId>
            <version>5.0.0-BETA6</version>
        </dependency>
    </dependencies>

    <reporting>
        <plugins>
            <plugin>
                <artifactId>maven-surefire-report-plugin</artifactId>
            </plugin>
        </plugins>
    </reporting>
</project>
```

The class implementing the automated tests needs to be updated in order to properly set up the IP of the Appium server.

```
//*****************************************************************************
//
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//
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//
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// THE SOFTWARE.
//
//*****************************************************************************

import org.junit.*;
import org.openqa.selenium.WebElement;
import org.openqa.selenium.remote.DesiredCapabilities;
import java.util.concurrent.TimeUnit;
import java.net.URL;
import io.appium.java_client.windows.WindowsDriver;
```

```
public class CalculatorTest {

    private static WindowsDriver CalculatorSession = null;
    private static WebElement CalculatorResult = null;

    @BeforeClass
    public static void setup() {
        try {
            DesiredCapabilities capabilities = new DesiredCapabilities();
            capabilities.setCapability("app", "Microsoft.WindowsCalculator_8wekyb3d8bbwe!App");
            CalculatorSession = new WindowsDriver(new URL("http://192.168.56.102:4723"), capabilities);
            CalculatorSession.manage().timeouts().implicitlyWait(2, TimeUnit.SECONDS);

            CalculatorResult = CalculatorSession.findElementByAccessibilityId("CalculatorResults");
            Assert.assertNotNull(CalculatorResult);

        }catch(Exception e){
            e.printStackTrace();
        } finally {
        }
    }

    @Before
    public void Clear()
    {
        CalculatorSession.findElementByName("Clear").click();
        Assert.assertEquals("0", _GetCalculatorResultText());
    }

    @AfterClass
    public static void TearDown()
    {
        CalculatorResult = null;
        if (CalculatorSession != null) {
            CalculatorSession.quit();
        }
        CalculatorSession = null;
    }

    @Test
    public void Addition()
    {
        CalculatorSession.findElementByName("One").click();
        CalculatorSession.findElementByName("Plus").click();
        CalculatorSession.findElementByName("Seven").click();
        CalculatorSession.findElementByName("Equals").click();
        Assert.assertEquals("8", _GetCalculatorResultText());
    }

    @Test
    public void Combination()
    {
        CalculatorSession.findElementByName("Seven").click();
        CalculatorSession.findElementByName("Multiply by").click();
        CalculatorSession.findElementByName("Nine").click();
        CalculatorSession.findElementByName("Plus").click();
        CalculatorSession.findElementByName("One").click();
        CalculatorSession.findElementByName("Equals").click();
        CalculatorSession.findElementByName("Divide by").click();
        CalculatorSession.findElementByName("Eight").click();
        CalculatorSession.findElementByName("Equals").click();
        Assert.assertEquals("8", _GetCalculatorResultText());
    }

    @Test
    public void Division()
    {
        CalculatorSession.findElementByName("Eight").click();
        CalculatorSession.findElementByName("Eight").click();
        CalculatorSession.findElementByName("Divide by").click();
        CalculatorSession.findElementByName("One").click();
```

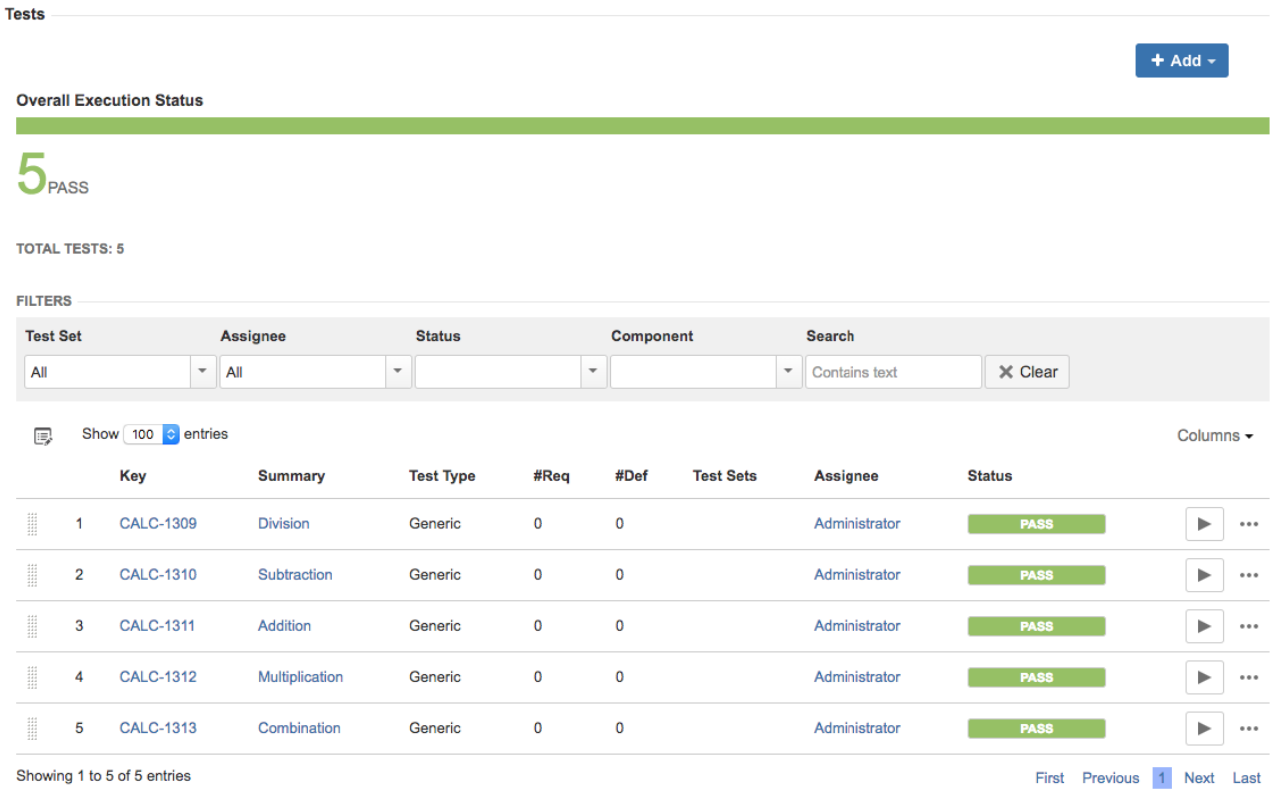
```
        CalculatorSession.findElementByName("One").click();
        CalculatorSession.findElementByName("Equals").click();
        Assert.assertEquals("8", _GetCalculatorResultText());
    }

    @Test
    public void Multiplication()
    {
        CalculatorSession.findElementByName("Nine").click();
        CalculatorSession.findElementByName("Multiply by").click();
        CalculatorSession.findElementByName("Nine").click();
        CalculatorSession.findElementByName("Equals").click();
        Assert.assertEquals("81", _GetCalculatorResultText());
    }

    @Test
    public void Subtraction()
    {
        CalculatorSession.findElementByName("Nine").click();
        CalculatorSession.findElementByName("Minus").click();
        CalculatorSession.findElementByName("One").click();
        CalculatorSession.findElementByName("Equals").click();
        Assert.assertEquals("8", _GetCalculatorResultText());
    }

    protected String _GetCalculatorResultText()
    {
        // trim extra text and whitespace off of the display value
        return CalculatorResult.getText().replace("Display is", "").trim();
    }

}
```

Tests can be run using Maven.

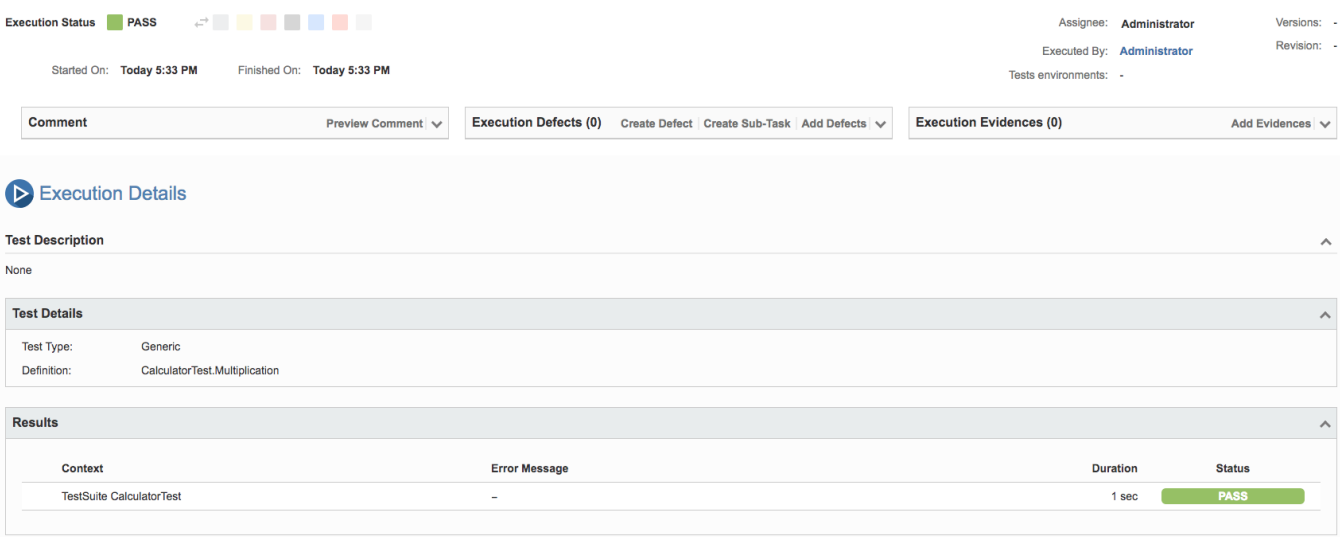
```
mvn clean test
```

After successfully running the Test cases and generating the JUnit XML report (e.g., TEST-CalculatorTest.xml), it can be imported to Xray (either by the REST API or through the **Import Execution Results** action within the Test Execution).

Each JUnit's Test Case is mapped to a Generic Test in Jira, and the **Generic Test Definition** field contains the name of the class and the method name that implements the Test Case.




The Execution Details of the Generic Test contains information about the Test Suite, which in this case corresponds to the Test Case class.




# References


- https://github.com/Microsoft/WinAppDriver
- http://appium.io