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Frameworks in [Selenium](#) help separate the code and the data to help make the code reusable, readable and reduces cost of maintenance. Keyword Driven Testing Framework using [Selenium WebDriver](#).

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What is a Keyword Driven Framework in Selenium

A Keyword Driven Framework has all operations and instructions written in an e

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The test cases are performed and results are returned
- 4


The test output data is stored in the Excel sheet
- Even though the process is simple, a structured approach is followed in Selenium. But before exploring that, let's talk about how it is different from the [Data Driven approach](#).

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Difference Between Data Driven And Keyword Driven Framework

Keyword Driven Framework	Data Driven Framework
Easy to maintain due to more abstraction layers between test scripts, test data, keywords, etc.	Comparatively harder to maintain since the abstraction is only between test data and test scripts
Planning has to be extensive and precise for keyword driven frameworks	Planning is less extensive and test scripts are more flexible
It is possible to write test scripts even before the product has finished development stage	One has to wait for development to finish before writing test cases

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Excel Sheet – It is used to store the data for test cases such as keywords

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Read More: [How to Read/Write Excel Data using Apache POI Sel](#)

Keyword Driven Framework Using WebDriver : Example

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Let’s create a simple design of a Keyword Driven Framework with the help of a scenario. The scenario automate the end to end flow of a web application.


Scenario to be automated:

1. Open a Browser
2. Navigate to URL <https://www.browserstack.com/>
3. Enter username
4. Enter password
5. Click on the Login button
6. Click on the Logout button
7. Close the browser

Step1: To design a Keyword Driven Framework, first identify all the actions to be performed for automated testing of an application. In the above scenario, there are several actions performed.

Step 2: Once all actions are identified, the next step is to create a keyword map table in the Excel sheet. Keyword map table is a table in an Excel sheet that defines all the keywords available for test automation projects.

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1	Login to Application	Step 1	Open browser	open Browser
		Step 2	Navigate to URL	navigate

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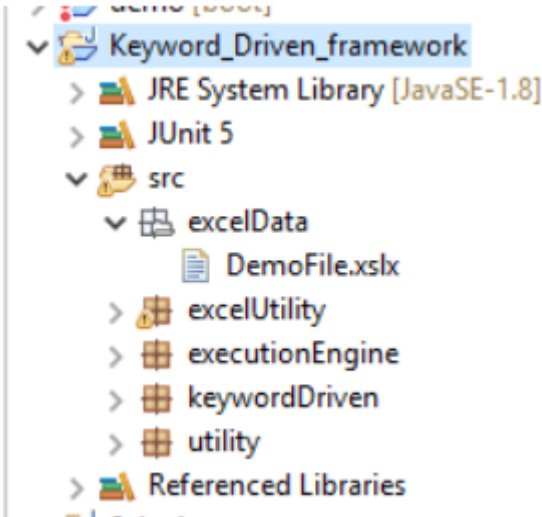
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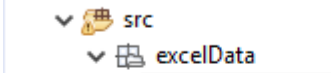
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Place the newly created Excel file in the package directory locally on the computer. The package structure of the keyword-driven framework can be seen in the screenshot below.

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Read More: [How to Launch Browser in Selenium](#)

Step 4: Create a new package named “**utility**”. Now, create a new class file named “**Constants**”. In this class, the tester will define constants like **URL**, **filePath**, and **excelData**. So

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```
package utility;
public class Constants {
    public static final String URL = "https://www.browserstack.com/users/sign_in/";
    //Mention the path to your excel file
    public static final String filePath = "D:\\DemoFile.xlsx";
    public static final String excelData = "DemoFile.xlsx";
    public static final String username = "Your_Username";
    public static final String password = "Your_password";
}
```

Step 5: Now write code for each action keyword. Create a new package named “**keywordDriven**”. Create a new class file named “**Action_Keyword**”. In this class, create methods for each Action Keyword that has been identified in Excel.

```
package keywordDriven;
import java.util.concurrent.TimeUnit;
import org.openqa.selenium.By;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.chrome.ChromeDriver;
import utility.Constants;
public class Action_keyword
{
    public static WebDriver driver;
```

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system.setProperty("webdriver.chrome.driver", "D:\\Selenium\\chromedriver.exe");

WebDriver driver = new ChromeDriver();

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```

driver.findElement(By.xpath("//input[@id='user_password']"))
}
public void clickSignIn()
{
driver.findElement(By.xpath("//form[@id='signin_signup_form']
}

public void logout()
{
driver.findElement(By.xpath("//a[@id='sign_out_link']")).cl
}
public void closeBrowser()
{
driver.quit();
}
}

```

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Step 6: In this step, write code to read data from an Excel sheet. For this, use an Apache POI library which allows testers to read, create and edit Microsoft Office documents using Java.

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Create a new package named “**excelUtility**” and then create a new class file named “**ReadExcelSheet**”. Look at the following source code to read all keywords from the step table

```

package excelUtility;
import java.io.File;
import java.io.FileInputStream;
import java.io.IOException;
import java.util.ArrayList;
import java.util.Iterator;

```

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```
import org.apache.poi.xssf.usermodel.XSSFWorkbook;
import utility.Constants;
```

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```
row.next();
ArrayList<String> a = new ArrayList();
// Checking the next element availability using the referen
while(row.hasNext())
{
    Row r = (Row) row.next();
    // Moving cursor to the cell by getting a cell number.
    Cell c = r.getCell(colNo);
    String data = c.getStringCellValue();
    /
    a.add(data);
    a.add(((Row) row.next()).getCell(colNo).getStringCellValue());
}
System.out.println("List: " +a);
// Return the data to the ArrayList method.
return a;
}

public void DemoFile(int i) {
    // TODO Auto-generated method stub

}
}
```

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Step 7: Next step is to write code for calling `readExcelData()` method of `ReadExcelSheet` class and methods of `ActionKeywords` class. Create a new package named “`executionEngine`” and write the following source code by creating a class named “`ExecutionTest`”.

```
package executionEngine;

import java.io.IOException;
import java.lang.reflect.InvocationTargetException;
```

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public class ExecutionTest
{
 // ...
}

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Observe the output by executing the code:

Starting ChromeDriver 83.0.4103.39 (ccbf011cb2d2b19b506d844400483861342c20cd-
Only local connections are allowed.
Please see <https://chromedriver.chromium.org/security-considerations> for suggestions.

List: [openBrowser, navigate, enterEmail, enterPassword, clickSignIn, logout, closeBrowser]
Test executed successfully

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Advantages And Disadvantages of Keyword Driven Testing Framework

Advantages	Disadvantages
Code Reusability	Keyword Management
Platform independent Test Scripts	Extensive P
Enhanced Productivity	Expertise required to write test scripts

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The benefits are evident enough to prove the mettle of Keyword Driven Framework in Selenium. Testers

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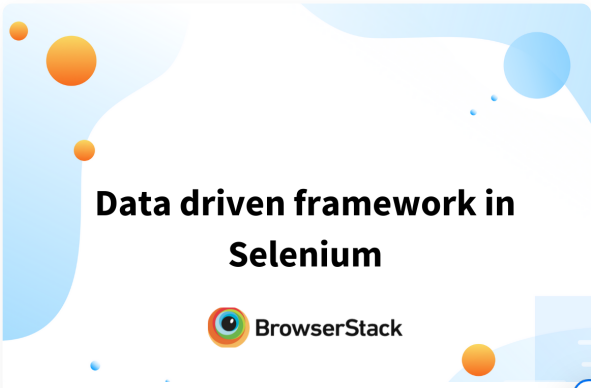
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