SPECFLOW

Pre-requisite – C#, Selenium WebDriver

Framework

* Specflow - BDD
* Page Object Model
* Nunit
* Extend Report
* Livingdoc 🡪 new reports
* Database – MSSQL
* Excel Integration (additional – not recommended)

Day 1:

* Introduction to BDD Framework
* Working on some Pre-requisite

BDD - Behavior Driven Development - End Feature of the Application

* Actual BDD Model
* Modified BDD Model

Scenario 🡪 Gherkins 🡪 Sign up feature

Given: Pre-requisite (you should land on the sign up page)

When: Operation ( Event) 🡪 firstname, lastname. Phonenumber, password,signup)

Then: verification

Where to apply BDD?

1. Everyone knows about the product.
2. Some of the people in the team know about the product.
3. Business people/top level management know about the product.
4. Product done by someone outside the organization/project team but it is new to the current organization/project team.
5. Completely new product – R&D

Advantages of BDD:

1. Living documentation
2. New Member
3. Enable collaboration within the team.
4. Non-technical

Acceptance Testing:

1. Code style 🡪 towards technical team (development team)
2. Imperative style 🡪 falls between developers/qa and stakeholder
3. Declarative style 🡪 non technical – stakeholder

Code Style:

**Scenarion: Valid Credential**

**Given: I have a browser “chrome” with url “https://magento.com/”**

**When: I enter username with id “email” as “**[**balaji0017@gmail.com**](mailto:balaji0017@gmail.com)**”**

**And: I enter password with id “pass” as “balaji@12345”**

**And: I click on continue with id “send2”**

**Then: I should get access to the portal with title as “My Account”**

Imperative style:

**Scenarion: Valid Credential**

**Given: I have a browser “chrome” with url “https://magento.com/”**

**When: I enter username as “**[**balaji0017@gmail.com**](mailto:balaji0017@gmail.com)**”**

**And: I enter password as “balaji@12345”**

**And: I click on continue**

**Then: I should get access to the portal with title as “My Account”**

Declarative style:

**Scenarion: Valid Credential**

**Given: I have a browser with url**

**When: I provide valid credentials**

**Then: I should get access to the portal**

**Install –**

**BDD**

1. **Visual Studio IDE (community – open source)**

[**https://visualstudio.microsoft.com/vs/**](https://visualstudio.microsoft.com/vs/)

1. **Setup visual studio to support Specflow** 
   1. **Under extension 🡪 manage extension**
   2. **Choose online in the left pane**
   3. Search for specflow 🡪 download Specflow for visual studio 2019
   4. Search for nunit 🡪 download nunit3 test adapter
   5. Close the vs and wait, It will install vsix

**Architecture of specflow C# - BDD:**

**Scenarios (based on acceptance testing) (.feature) (Feature file) 🡪 Coding (.cs) (Step Definition) (Nunit – For verification)**

**Feature File: (.feature)**

* **Feature header**
* **Formatted description or unformatted description.**

**Unformatted description**

**This feature test all the scenarios related to login part**

**Formatted description**

**In order [business goal]**

**As a [role]**

**I would like [visible change in the application]**

**C# 🡪**

**Source code 🡪 .dll/.exe (MSIL) 🡪 o/p**

**Specflow Project**

1. **Create a Specflow project (which will come with all the dependencies/nuget packages)**
2. **Create feature file and add the scenario**

**Feature can be written in online editor as well** [**https://specflow.org/gherkin-editor/**](https://specflow.org/gherkin-editor/)

**Or**

**Alternate project**

1. **Create unit test project**
2. **Add the dependencies** 
   1. **Specflow**
   2. **nunit**
   3. **Specflow.nunit**
   4. **SpecFlow.Tools.MsBuild.Generator**
   5. **Selenium 🡪 Selenium.Webdriver and selenium.support from nuget packages**
3. **[Binding] attribute helps the gherkins code to connect with the step definition.**
4. **Debug the code**
5. **Selenium Configuration with Specflow**

**Selenium.Webdriver and selenium.support from nuget packages**

[**https://www.selenium.dev/**](https://www.selenium.dev/)

1. **Fix the below support/driver issue**

Error: OpenQA.Selenium.DriverServiceNotFoundException : The chromedriver.exe file does not exist in the current directory or in a directory on the PATH environment variable. The driver can be downloaded at <http://chromedriver.storage.googleapis.com/index.html>.

1. **By downloading the support file and configuring manually in the bin folder**
2. **Adding it to environment variable**
3. **Through constructor 🡪 through code.**
4. **Setup using Nuget package**
5. **Chrome,firefox,ie**

**For IE browser**

* 1. **Zoom level should be 100%**
  2. **Security should be at same level under tools 🡪 internet options🡪 security**

1. **Parameterization – reduce duplicates in the step definition.**
2. **Scenario Outline - reduce the duplicates in feature file**
3. **Hooks** 
   1. **BeforeTestRun**
   2. **AfterTestRun**
   3. **BeforeFeature**
   4. **AfterFeature**
   5. **BeforeScenario**
   6. **AfterScenario**
   7. **BeforeStepBlock**
   8. **AfterStepBlock**
   9. **BeforeStep**
   10. **AfterStep**
4. **Background**
5. **Creating hoosks for handling the brower**
6. **Tags**

*@ignore 🡪 inbuild tag for ignoring the scenarios/feature*

1. **Datatable**

**converting below multiple statement into datatable**

And I enter firstname as '*bala*'

And I enter lastname as '*dina*'

And I enter dob as '*2021-03-31*'

And I select gender as '*Male*'

1. **Scope** 
   1. **Control the feature’s, scenario’s, tags step defn to connect and control the class to bind with feature,scenario, tags**

[Scope(Feature = "ChangePassword")]

1. **Transfer the data between scenario context/feature context** 
   1. **To transfer data between steps then use scenario context**
   2. **To transfer data between feature then use feature context**

**Four way to improve maintainability**

* **Shared Step Definition 🡪 Code reuse parameters**
* **Scenario Outline 🡪 Duplicates/One scenario – multiple data**
* **Background 🡪 Readability/ Repeated given**
* **Datatable 🡪 Readability/Tabular data**

1. **Extent Report 🡪 Customized**
2. **Specflow Livingdoc report 🡪 Latest detailed specflow livingdoc**

[**https://docs.specflow.org/projects/specflow-livingdoc/en/latest/LivingDocGenerator/Test-execution-results.html**](https://docs.specflow.org/projects/specflow-livingdoc/en/latest/LivingDocGenerator/Test-execution-results.html)

* **Install livingdoc plugin through command prompt**

dotnet tool install --global SpecFlow.Plus.LivingDoc.CLI

* **Using test-assembly generating the report**

**livingdoc test-assembly OpenEmrApplication.dll -t TestExecution.json**

* **Generate report for feature file (no execution report)**

**livingdoc feature-folder D:\B-Mine\Company\Company\CGI2\OpenEmrApplication\OpenEmrApplication**

* **Using feature folder and merging execution report**

**livingdoc feature-folder D:\B-Mine\Company\Company\CGI2\OpenEmrApplication\OpenEmrApplication -t D:\B-Mine\Company\Company\CGI2\OpenEmrApplication\OpenEmrApplication\bin\Debug\netcoreapp3.1\TestExecution.json**

**Embed image into livingdoc html**

[**https://docs.specflow.org/projects/specflow-livingdoc/en/latest/Generating/Markdown-and-Embedding-Images.html#embedding-images**](https://docs.specflow.org/projects/specflow-livingdoc/en/latest/Generating/Markdown-and-Embedding-Images.html#embedding-images)

1. **Selenium – inspect** 
   1. **Tagname, attribute, text or not**
   2. **Locators/target** 
      1. **Id**
      2. **Name**
      3. **Classname**
      4. **Tagname**
      5. **Linktext**
      6. **Partial link text**
   3. **Advance locator**
      1. **Xpath**
      2. **Css**

**When there is a duplicates, it will pick first element.**

IWebElement ele= driver.FindElement(By.LinkText("My Account"));

ele.Click();

* 1. **Selenium exception -** OpenQA.Selenium.NoSuchElementException
  2. driver.FindElement(By.LinkText("My Account123")).Click(); //0.5s for doing operation
  3. **Synchronization** 
     1. **Unconditional wait**
     2. **Conditional wait** 
        1. **Implicit wait** 
           1. **Default implicit wait 🡪 0s**
           2. **Will be applicable for all findlement and findelements methods.**
           3. **Example: implicit wait 🡪 30s**

**Element not there, it will throw error after 30s**

**Element is there (in 5 sec), it will move to next step immediately**

**Polling time – 0.5s**

* + - 1. **Explicit wait / Default wait / Fluent wait**
         1. **Exact condition**
         2. **Possible to change the polling time**
  1. **How to get “IWebElement” 🡪** FindElement method return **IWebElement**
  2. **How to get “By” 🡪** By.LinkText("My Account")
  3. **Close vs quit** 
     1. **Close – it will close the current tab/current session**
     2. **Quit – will close the browser and also kill the process**

1. **Page Object Model – design pattern** 
   1. **Reusability**
   2. **Maintenance**

* **Each page will have class. For 10 pages = 10 classes – page class**
* **Operations will happen through method – page methods**
* **Object repositories 🡪 keep at class level/different class**
* **Methodname 🡪 WaitUntilTheLogoutPresent**

1. **Excel – ClosedXML package from nuget**
   1. **Workbook**
   2. **Sheet**
   3. **Row**
   4. **Cell**
2. **Database – Sqlclient package from nuget for MSSQL**
   1. **Get first cell value**
   2. **Update/insert/delete**
   3. **Select query**
3. **Git**

**Project in local system 🡪 local repository 🡪 server repo (**[**https://github.com/balaji-githubstore/cgisample.git**](https://github.com/balaji-githubstore/cgisample.git)**)**

**Step 1: Install git scm 🡪 to get the git commands**

[**https://git-scm.com/**](https://git-scm.com/)

**Step2: Create github account and create repository**

**git init** -🡪 create a local repo

**git add README.md** 🡪 files planning to move

**git commit -m "first commit**" 🡪 update the local repo

git remote add origin <https://github.com/balaji-githubstore/cgisample.git> 🡪 registering the detail of server repo

git push -u origin master 🡪 update the server

1. **To build the project – MSBUILD**

* **Add below path to environment path variable**

**C:\Program Files (x86)\Microsoft Visual Studio\2019\Community\MSBuild\Current\Bin**

* **To build**

**Msbuild –t:clean;restore;rebuild** [OpenEmrApplication.csproj](https://github.com/balaji-githubstore/OpenEmrApplicationCGI/blob/master/OpenEmrApplication.csproj)

1. **First run the project through cmd using vstest.console**

* **Add below path to environment variable**

**C:\Program Files (x86)\Microsoft Visual Studio\2019\Community\Common7\IDE\CommonExtensions\Microsoft\TestWindow**

* **TO list the test case**

**vstest.console OpenEmrApplication.dll /ListTests**

* **To Run**

**Vstest.console OpenEmrApplication.dll**

**Or**

**Vstest.console “D:\B-Mine\Company\Company\CGI2\OpenEmrApplication\OpenEmrApplication\bin\Debug\netcoreapp3.1\OpenEmrApplication.dll”**

**Or**

**vstest.console OpenEmrApplication.dll /Tests:ConntectingCites1,InvalidCredential**

1. **Jenkins 🡪 server 🡪 Jenkins url** 
   1. **Will start Jenkins locally and configure the github project**
   2. **To trigger Jenkins locally**

**java -jar jenkins.war**

* 1. **Login to Jenkins**
  2. **Configure the project** 
     1. **Click New item**
     2. **Click Freestyle project and provide name**
     3. **Configure the SCM 🡪 paste git url and credential if any and check branch name**
     4. **Set poll scm as 🡪 H/2 \* \* \* \***
     5. **Under Build setup**

**Build 1:**

**Msbuild**

**Build2:**

**Vstest.console**

**Queries:**

1. **Step definition – duplicates possible or not**

//wait for the dashboard page to load

//string title = driver.Title;

//Console.WriteLine(title);

//string title = driver.Title;

//string url = driver.Url;

//string ps = driver.PageSource;

Scenario: Add Patient Record

Given I have browser with openemr url

When I enter username as '*admin1*'

And I enter password as '*pass*'

And I select the language as '*English (Indian)*'

And I click on login

And I do mousehover on patient-client menu

And I click on patients menu

And I click on Add New Patient

And I fill the form

| *firstname* | *lastname* | *dob* | *gender* | *marital\_status* |

| bala | dina | 2021-04-01 | Male | Domestic Partner |

And I click on create new patient

And I click on confirm create new patient

And I handle the alert

And I close the happy birthday popup

Then I should get the added recorde as '*Medical Record Dashboard - Bala Dina*'

Scenario: Add Patient Record

Given I have browser with openemr url

When I enter username as '*admin1*'

And I enter password as '*pass*'

And I select the language as '*English (Indian)*'

And I click on login

And I do mousehover on patient-client menu

And I click on patients menu

And I click on Add New Patient

And I fill the form

| *firstname* | *lastname* | *dob* | *gender* | *marital\_status* |

| john| cena| 2021-04-01 | Male | Domestic Partner |

And I click on create new patient

And I click on confirm create new patient

And I handle the alert

And I close the happy birthday popup

Then I should get the added recorde as '*Medical Record Dashboard - Jhn* cena

**Sheet into datatable in C#**

XLWorkbook book = new XLWorkbook(@"D:\Report\OpenEMRData.xlsx");

IXLWorksheet sheet = book.Worksheet("Invalid Credential");

int rowCount = sheet.RangeUsed().RowCount();

int colCount = sheet.RangeUsed().ColumnCount();

DataTable dt = new DataTable();

for(int c=1;c<= colCount; c++)

{

Console.WriteLine(sheet.Row(1).Cell(c).GetString());

dt.Columns.Add(sheet.Row(1).Cell(c).GetString());

}

Console.WriteLine("-----------------------------");

for (int r = 2; r <= rowCount; r++)

{

DataRow row = dt.NewRow();

for (int c = 1; c <= colCount; c++)

{

Console.WriteLine(sheet.Row(r).Cell(c).GetString());

row[c - 1] = sheet.Row(r).Cell(c).GetString();

}

dt.Rows.Add(row);

}

Not recommended to transfer data between steps like below

public class GoogleMapSteps

{

public static Table tb;

[Given(@"I have browser with google map url")]

public void GivenIHaveBrowserWithGoogleMapUrl()

{

}

[When(@"i enter cities")]

public void WhenIEnterCities(Table table)

{

tb = table;

}

[Then(@"I should get the km connecting all cities")]

public void ThenIShouldGetTheKmConnectingAllCitiesAs()

{

Console.WriteLine(tb.RowCount);

}

}