

BDD



- 1) BDD, Specification by Example
- 2) SpecFlow, TestStack.BDDfy
- 3) Acceptance testing

Links

<https://habrahabr.ru/post/166747/>

Specification By Example – BDD для прагматиков

<https://habrahabr.ru/post/182032/>

Исполняемая спецификация: SpecFlow от А до Я

<https://habrahabr.ru/post/178407/>

Автоматизация тестирования Web-приложений (BDD-style)

SbE

В основе процесса *Specification By Example* лежат

- agile
- TDD
- BDD
- Continuous Integration

Ключевые элементы *Specification By Example*:

- Выделяйте главное (*deriving scope from goals*)
- Составляйте спецификацию совместно (*specifying collaboratively*)
- Приводите примеры (*illustrating using examples*)
- Очищайте спецификацию (*refining the specification*)
- Внедряйте автоматизацию тестирования без изменения спецификации (*automating validation without changing specification*)
- Встраивайте выполнение тестов в процесс сборки и развивайте документацию (*validating frequently, evolving a documentation system*)

User Stories

User-stories обязательно должны содержать 3 пункта:

<i>In order to</i>	—	зачем?
<i>As a</i>	—	кто?
<i>I want</i>	—	что?

Given — первоначальный контекст (предусловие)

When — событие (что является триггером сценария)

Then — результат, который мы хотим получить

Feature and Scenario

Feature: Free delivery

In order to save money

As a VIP customer

I want the system to offer free delivery on certain items to me

Scenario: Free delivery

Given I am a VIP customer

And I am on product detail page

And There are only books in my shopping cart

And There are ≤ 10 books in my shopping cart

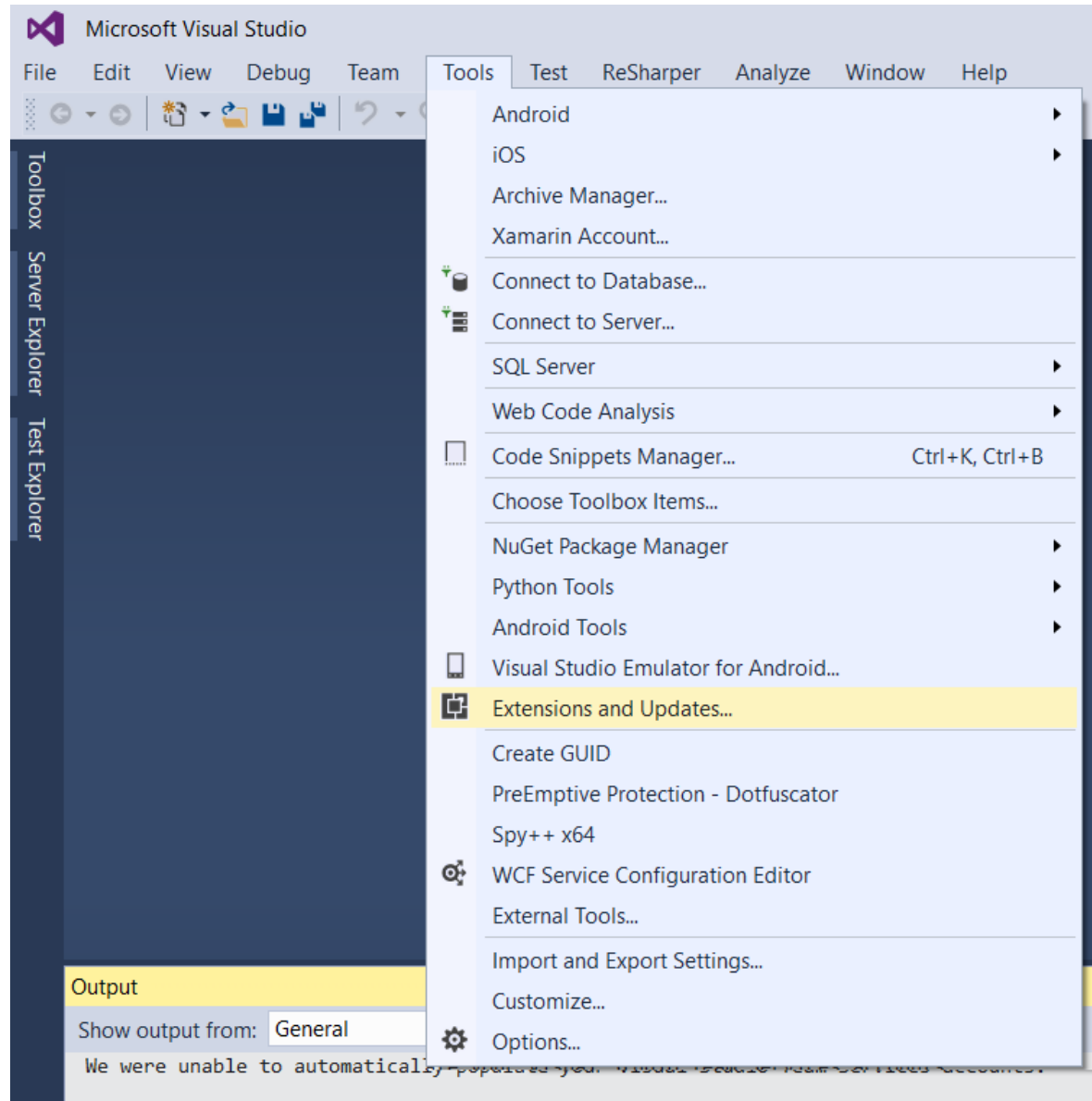
And I have added 'ABC Press' book to my shopping cart

When I press 'Go to checkout' button

And I have chosen 'Moscow' in 'Ship To' dropdown

Then I can choose free delivery

Install SpecFlow



Install SpecFlow

Extensions and Updates

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▸ Updates (4)

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specflow



SpecFlow for Visual Studio 2015

SpecFlow integration for Visual Studio 2015. Sponsored by TechTalk (<http://www...>)

Download



Specification By Example Extension

Extension to scaffold Selenium-based specification by example tests for any webpage. First use the Project Tem...

Created by: TechTalk SpecFlow Team

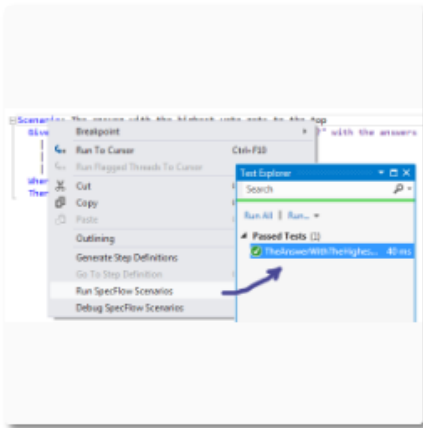
Version: 2017.1.10

Downloads: 167194

Rating: ★★★★★ (23 Votes)

[More Information](#)

[Report Extension to Microsoft](#)



1

Change your Extensions and Updates settings

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SpecFlow

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Installed

Updates **1**

specflow.nUnit



☐ Include prerelease



SpecFlow.NUnit by TechTalk, **695K** downloads v2.2.1

Combined package to setup SpecFlow with NUnit v2.6+ easily.
For running tests with NUnit runners, use SpecFlow.NUnit.Runne...



SpecFlow.NUnit.Runners by TechTalk, **80,5K** downloads v2.2.1

Combined package to setup SpecFlow with NUnit easily for
running the tests with the NUnit runners.



WP7Test by slodge, **4,78K** downloads v0.9.6

Class library project. Provides BDD SpecFlow testing framework
for Windows Phone emulator



CatBrows by Sebastian Hallén, **4,01K** downloads v0.7.4

Browser tagging for spec flow scenarios.



SeleniumNUnitSpecflow by Jiannan Lu, **3,85K** downloads v1.0.4

A bootstrap package for using Selenium with NUnit and
Specflow



SpecFlow.NUnit

Version: Latest stable 2.2.1



Options

Description

Combined package to setup SpecFlow with NUnit

Version: 2.2.1

Author(s): TechTalk

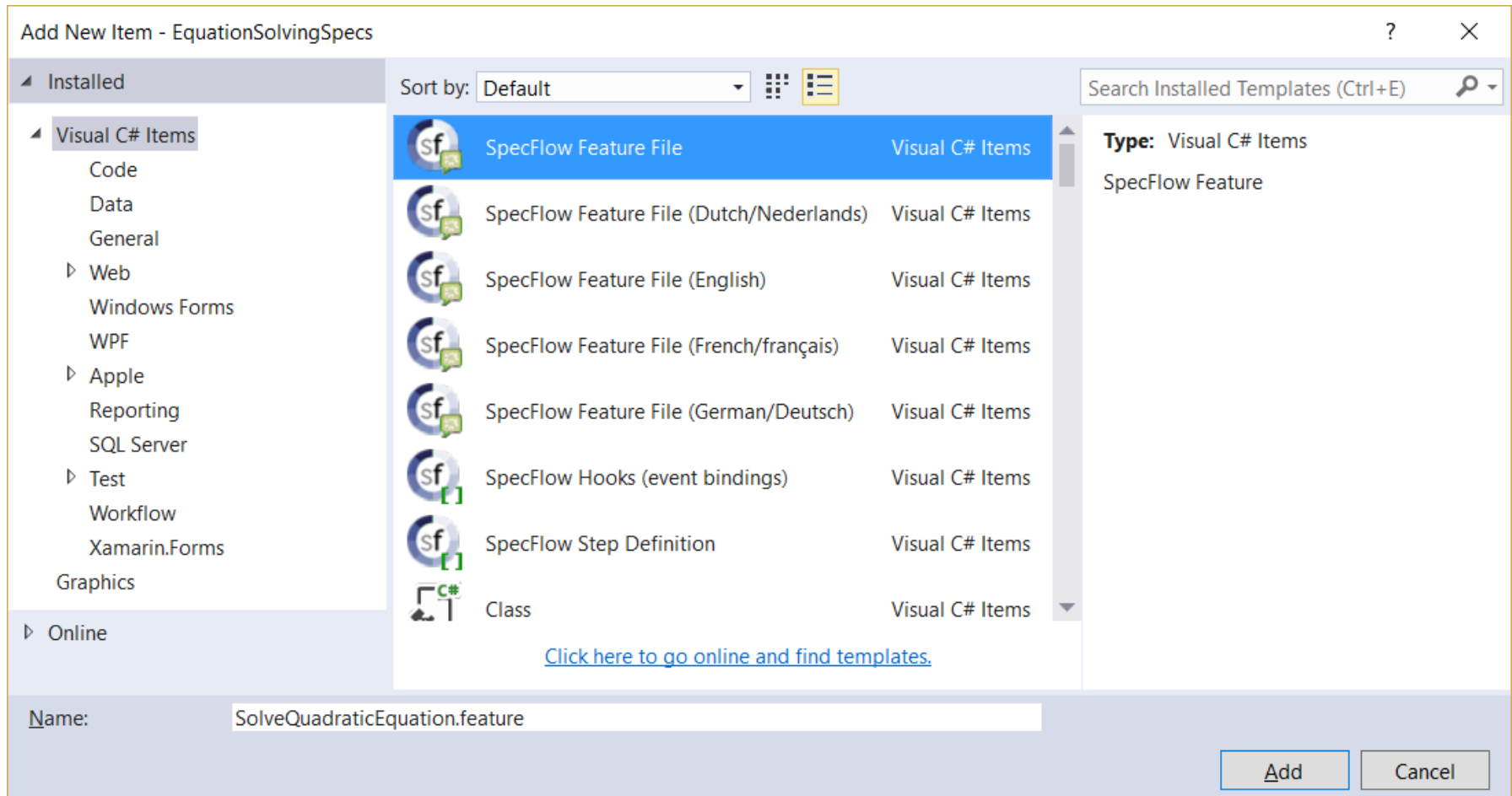
License: <http://go.specflow.org/license>

Date published: Tuesday, September 12, 2017 (9/

Project URL: <http://www.specflow.org>

Report Abuse: <https://www.nuget.org/packages>

Add SpecFlow Feature



Write SpecFlow Feature

EquationSteps.cs

SolveQuadraticEquation.feature

Feature: solving quadratic equation

In order to demonstrate that Quadratic Formula really works

As a school math teacher

I want to get the roots of quadratic equation

@math @ordinary

Scenario Outline: Solve ordinary quadratic equation

Given I have set <coefficient1>

And I have set <coefficient2>

And I have set <coefficient3>

When I press Solve

Then the roots should be <root1> and <root2>

Examples:

coefficient1	coefficient2	coefficient3	root1	root2
1	1	-6	-3	2
1	0	-4	2	-2
1	5	0	0	-5

Generate Step Definitions

The screenshot shows the Visual Studio IDE with a context menu open over the file `EquationSteps.cs`. The menu includes various development actions such as 'Go to Declaration', 'Refactor This...', 'Run Unit Tests', and 'Generate Step Definitions'. The 'Generate Step Definitions' option is highlighted in yellow. In the background, a Gherkin scenario is visible in the editor.

Specs - Microsoft Visual Studio

Project Build Debug

`EquationSteps.cs`

Feature: solving
In order to
As a school
I want to ge

@math @ordinary
Scenario Outline
Given I have
And I have s
And I have s
When I press
Then the roc

Examples:
| coefficient1 |
| 1 |
| 1 |
| 1 |

Go to Declaration
Go to Implementation
Navigate To
Find Usages Shift+F12
Refactor This... Ctrl+Shift+R
Refactor
Peek Definition Alt+F12
Inspect
Cleanup Code... Ctrl+E, Ctrl+C
Find Similar Code...
Run Unit Tests Ctrl+U, R
Debug Unit Tests Ctrl+U, D
Cover Unit Tests Ctrl+U, H
Show Covering Tests Ctrl+Alt+K, T
Breakpoint
Run To Cursor Ctrl+F10
Run Flagged Threads To Cursor
Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Outlining
Generate Step Definitions
Go To Step Definition Ctrl+Shift+Alt+S
Run SpecFlow Scenarios
Debug SpecFlow Scenarios

Generate Step Definitions

```
using TechTalk.SpecFlow;

namespace EquationSolvingSpecs
{
    [Binding]
    public class SolvingQuadraticEquationSteps
    {
        [Given(@"I have set (.*)")]
        public void GivenIHaveSet(string p0)
        {
            ScenarioContext.Current.Pending();
        }

        [When(@"I press Solve")]
        public void WhenIPressSolve()
        {
            ScenarioContext.Current.Pending();
        }

        [Then(@"the roots should be (.*) and (.*)")]
        public void ThenTheRootsShouldBeAnd(string p0, string p1)
        {
            ScenarioContext.Current.Pending();
        }
    }
}
```

Write Code

```
using TechTalk.SpecFlow;

namespace EquationSolvingSpecs
{
    [Binding]
    public class SolvingQuadraticEquationSteps
    {
        readonly EquationSolver _solver = new EquationSolver(new PolynomialRoots());

        readonly List<double> _coefficients = new List<double>();
        double[] _roots;

        [Given(@"I have set (.*)")]
        public void GivenIHaveSet(double coeff)
        {
            _coefficients.Add(coeff);
        }

        [When(@"I press Solve")]
        public void WhenIPressSolve()
        {
            _roots = _solver.Solve(_coefficients.ToArray());
        }

        [Then(@"the roots should be (.*) and (.*)")]
        public void ThenTheRootsShouldBeAnd(double r1, double r2)
        {
            Assert.That(_roots, Is.EquivalentTo(new [] { r1, r2 }));
        }
    }
}
```

Another scenario

@math @exception

Scenario: Solve ordinary quadratic equation with no real roots

Given I have set 1

And I have set 1

And I have set 6

When I press Solve

Then exception must occur

Generate Step Definition Skeleton - SpecFlow

The following steps have no matching step definition yet. Select the steps you want to generate a step definition skeleton for.

all

none

☒ [Then] "Then exception must occur" in scenario "Solve ordinary quadratic equation with no real roots"

Class name:

SolvingQuadraticEquationSteps

Style:

Regular expressions in attributes

Preview

[learn more about step definition styles](#)

Copy methods to clipboard

Generate

Cancel

Another scenario

```
[When(@"I press Solve")]
public void WhenIPressSolve()
{
    // 1-ый способ обработки исключения
    try
    {
        _roots = _solver.Solve(_coefficients.ToArray());
    }
    catch (Exception ex)
    {
        _exception = ex;
    }

    // 2-ой способ - Assert.Catch() и использовать Scope в атрибуте When
}

[Then(@"the roots should be (.*?) and (.*?)")]
public void ThenTheRootsShouldBeAnd(double r1, double r2)
{
    Assert.That(_roots, Is.EquivalentTo(new [] { r1, r2 }));
}

[Then(@"exception must occur")]
public void ThenExceptionMustOccur()
{
    Assert.That(_exception, Is.Not.Null);
    Assert.That(_exception, Is.TypeOf<ArithmeticException>());
}
```

Another feature

Feature: solving custom algebraic equation

In order to demonstrate how the algebraic equations are solved

As a school math teacher

I want to get the roots of algebraic equation

@math @ordinary

Scenario: Solve ordinary algebraic equation with real roots

Given I have specified array of coefficients { 1, 3, -5, -15, 4, 12 }

When I press Solve

Then the array of roots should be { -3, -2, -1, 1, 2 }

@math @exception

Scenario: Solve algebraic equation with no unknowns

Given I have set 0

And I have set 0

And I have set 3

When I press Solve

Then argument exception must occur

Extract Text Context

```
public class EquationSolvingContext
{
    public EquationSolver Solver { get; set; } = new EquationSolver(new FakeRoots());

    public List<double> Coefficients { get; set; } = new List<double>();
    public double[] Roots { get; set; }

    public Exception Exception { get; set; }
}
```

```

public class SolvingCustomAlgebraicEquationSteps
{
    private readonly EquationSolvingContext _context;

    public SolvingCustomAlgebraicEquationSteps(EquationSolvingContext context)
    {
        _context = context;
    }

    [Given(@"I have specified array of coefficients \{ ((?:.,\d+)*(?:.+) )\}")]
    public void GivenIHaveSpecifiedArrayOfCoefficients(List<double> coeffs)
    {
        _context.Coefficients = coeffs;
    }

    [Then(@"the array of roots should be \{ ((?:.,\d+)*(?:.+) )\}")]
    public void ThenTheArrayOfRootsShouldBe(List<double> roots)
    {
        Assert.That(_context.Roots, Is.EquivalentTo(roots));
    }

    [StepArgumentTransformation(@"((?:.,\d+)*(?:.+) )")]
    public static List<double> ListIntTransform(string doubles)
    {
        return doubles.Split(',').Select(double.Parse).ToList();
    }

    [Then(@"argument exception must occur")]
    public void ThenArgumentExceptionMustOccur()
    {
        Assert.That(_context.Exception, Is.Not.Null);
        Assert.That(_context.Exception, Is.TypeOf<ArgumentException>());
    }
}

```

BDD and UI testing

Feature: SearchCSharpFeature

In order to download WebDriver for C#

As a Selenium website visitor

I want to check that corresponding download link exists

Scenario: Search for C# download link

Given I have opened Selenium search page

And I have entered C#

When I press search button

Then the search results contain *Downloads*

BDD and UI testing

```
[Binding]
public class SearchCSharpFeatureSteps
{
    private IWebDriver _driver;

    private SeleniumSearchPage _searchPage;
    private SearchResultsPage _resultsPage;

    [BeforeScenario]
    public void Init()
    {
        _driver = new ChromeDriver();
        _driver.Manage().Timeouts().ImplicitWait = TimeSpan.FromSeconds(30);
    }

    [AfterScenario]
    public void Quit()
    {
        _driver.Quit();
    }
}
```

BDD and UI testing

```
[Given(@"I have opened Selenium search page")]
public void GivenIHaveOpenedSeleniumSearchPage()
{
    _searchPage = new SeleniumSearchPage(_driver);
    _searchPage.Navigate();
}

[Given(@"I have entered (.*)")]
public void GivenIHaveEntered(string query)
{
    _searchPage.EnterSearchQuery(query);
}

[When(@"I press search button")]
public void WhenIPressSearchButton()
{
    _resultsPage = _searchPage.ClickSearch();
}

[Then(@"the search results contain (.*)")]
public void ThenTheSearchResultsContain(string link)
{
    Assert.That(_resultsPage.Links, Does.Contain(link));
}
```

TestStack.BDDfy

<http://teststackbddfy.readthedocs.io/en/latest/>

Прочитать самостоятельно