

Installation

```
Install-Package NUnit
Install-Package NUnit.TestAdapter
Install-Package Microsoft.NET.Test.Sdk
```

Test Execution Workflow

```
using NUnit.Framework;
namespace NUnitUnitTests
{
    // A class that contains NUnit unit tests.
    (Required)
    [TestFixture]
    public class NonBellatrixTests
    {
        [OneTimeSetUp]
        public void ClassInit()
        {
            // Executes once for the test class.
        }
        (Optional)
    }
    [SetUp]
    public void TestInit()
    {
        // Runs before each test. (Optional)
    }
    [Test]
    public void TestMethod()
    {
    }
    [TearDown]
    public void TestCleanup()
    {
        // Runs after each test. (Optional)
    }
    [OneTimeTearDown]
    public void ClassCleanup()
    {
        // Runs once after all tests in this
        class are executed. (Optional)
        // Not guaranteed that it executes
        instantly after all tests from the class.
    }
}
// A SetUpFixture outside of any namespace
provides SetUp and TearDown for the entire
assembly.
[SetUpFixture]
public class MySetUpClass
{
    [OneTimeSetUp]
    public void RunBeforeAnyTests()
    {
        // Executes once before the test run.
    }
    (Optional)
}
[OneTimeTearDown]
public void RunAfterAnyTests()
{
    // Executes once after the test run.
}
(Optional)
}
```

Attributes

NUNIT 3.X	MSTEST V2.X	XUNIT.NET 2.X	COMMENTS
[Test]	[TestMethod]	[Fact]	Marks a test method.
[TestFixture]	[TestClass]	n/a	Marks a test class.
[SetUp]	[TestInitialize]	Constructor	Triggered before every test case.
[TearDown]	[TestCleanup]	IDisposable.Dispose	Triggered after every test case.
[OneTimeSetUp]	[ClassInitialize]	IClassFixture<T>	One-time triggered method before test cases start.
[OneTimeTearDown]	[ClassCleanup]	IClassFixture<T>	One-time triggered method after test cases end.
[Ignore("reason")]	[Ignore]	[Fact(Skip="reason")]	Ignores a test case.
[Property]	[TestProperty]	[Trait]	Sets arbitrary metadata on a test.
[Theory]	[DataRow]	[Theory]	Configures a data-driven test.
[Category("")]	[TestCategory("")]	[Trait("Category","")]	Categorizes the test cases or classes.

Assertions – Constraint Model

```
Assert.AreEqual(28, _actualFuel); // Tests whether the specified values are equal.
Assert.AreNotEqual(28, _actualFuel); // Tests whether the specified values are unequal. Same as AreEqual for numeric values.
Assert.AreSame(_expectedRocket, _actualRocket); // Tests whether the specified objects both refer to the same object
Assert.AreNotSame(_expectedRocket, _actualRocket); // Tests whether the specified objects refer to different objects
Assert.IsTrue(_isThereEnoughFuel); // Tests whether the specified condition is true
Assert.IsFalse(_isThereEnoughFuel); // Tests whether the specified condition is false
Assert.IsNull(_actualRocket); // Tests whether the specified object is null
Assert.IsNotNull(_actualRocket); // Tests whether the specified object is non-null
Assert.IsInstanceOf(_actualRocket, typeof(Falcon9Rocket)); // Tests whether the specified object is an instance of the expected type
Assert.IsNotInstanceOf(_actualRocket, typeof(Falcon9Rocket)); // Tests whether the specified object is not an instance of type
StringAssert.AreEqualIgnoringCase(_expectedBellatrixTitle, "Bellatrix"); // Tests whether the specified strings are equal ignoring their casing
StringAssert.Contains(_expectedBellatrixTitle, "Bellatrix"); // Tests whether the specified string contains the specified substring
StringAssert.DoesNotContain(_expectedBellatrixTitle, "Bellatrix"); // Tests whether the specified string doesn't contain the specified substring
StringAssert.StartsWith(_expectedBellatrixTitle, "Bellatrix"); // Tests whether the specified string begins with the specified substring
StringAssert.StartsWith(_expectedBellatrixTitle, "Bellatrix"); // Tests whether the specified string begins with the specified substring
StringAssert.IsMatch("(281)388-0388", @"(?:d{3})?-? *d{3}-? *-?d{4}"); // Tests whether the specified string matches a regular expression
StringAssert.DoesNotMatch("(281)388-0388", @"(?:d{3})?-? *d{3}-? *-?d{4}"); // Tests whether the specified string does not match a regular expression
CollectionAssert.AreEqual(_expectedRockets, _actualRockets); // Tests whether the specified collections have the same elements in the same order and quantity.
CollectionAssert.AreNotEqual(_expectedRockets, _actualRockets); // Tests whether the specified collections does not have the same elements or the elements are in a different order and quantity.
CollectionAssert.AreEqual(_expectedRockets, _actualRockets); // Tests whether two collections contain the same elements.
CollectionAssert.AreNotEquivalent(_expectedRockets, _actualRockets); // Tests whether two collections contain different elements.
CollectionAssert.AllItemsAreInstancesOfType(_expectedRockets, _actualRockets); // Tests whether all elements in the specified collection are instances of the expected type
CollectionAssert.AllItemsAreNotNull(_expectedRockets); // Tests whether all items in the specified collection are non-null
CollectionAssert.AllItemsAreUnique(_expectedRockets); // Tests whether all items in the specified collection are unique
CollectionAssert.Contains(_actualRockets, falcon9); // Tests whether the specified collection contains the specified element
CollectionAssert.DoesNotContain(_actualRockets, falcon9); // Tests whether the specified collection does not contain the specified element
CollectionAssert.IsSubsetOf(_expectedRockets, _actualRockets); // Tests whether one collection is a subset of another collection
CollectionAssert.IsNotSubsetOf(_expectedRockets, _actualRockets); // Tests whether one collection is not a subset of another collection
Assert.Throws<ArgumentNullException>(() => new Regex(null)); // Tests whether the code specified by delegate throws exact given exception of type T
```

Author Attribute

```
[TestFixture]
[Author("Joro Doe", "joro.doe@bellatrix.solutions")]
public class RocketFuelTests
{
    [Test]
    public void RocketFuelMeasuredCorrectly_When_Landing()
    {
        //...
    }
    [Test]
    [Author("Ivan Penchev")]
    public void RocketFuelMeasuredCorrectly_When_Flying()
    {
        //...
    }
}
```

Repeat Attribute

```
[Test]
[Repeat(10)]
public void RocketFuelMeasuredCorrectly_When_Flying()
{
    //...
}
```

Combinatorial Attribute

```
[Test, Combinatorial]
public void CorrectFuelMeasured_When_X_Site([Values(1,2,3)] int x, [Values("A","B")] string s)
{
    //...
}
```

Pairwise Attribute

```
[Test, Pairwise]
public void ValidateLandingSiteOfRover_When_GoingToMars([Values("a", "b", "c")] string a, [Values("+", "-")] string b, [Values("x", "y")] string c)
{
    Debug.WriteLine("{0} {1} {2}", a, b, c);
}
```

Random Attribute

```
[Test]
public void GenerateRandomLandingSiteOnMoon([Values(1,2,3)] int x, [Random(-1.0, 1.0, 5)] double d)
{
    //...
}
```

Range Attribute

```
[Test]
public void CalculateJupiterBaseLandingPoint([Values(1,2,3)] int x, [Range(0.2,0.6)] double y)
{
    //...
}
```

Retry Attribute

```
[Test]
[Retry(3)]
public void CalculateJupiterBaseLandingPoint([Values(1,2,3)] int x, [Range(0.2,0.6)] double y)
{
    //...
}
```

Timeout Attribute

```
[Test, Timeout(2000)]
public void FireRocketToProximaCentauri()
{
    //...
}
```

Execute Tests in Parallel

```
[assembly:Parallelizable(ParallelScope.Fixtures)]
[assembly:LevelOfParallelism(3)]
```

```
[TestFixture]
[Parallelizable(ParallelScope.Fixtures)]
public class TestFalcon9EngineLevels
{
    //...
}
```