

Testing ../modules/override_node_options

....

Time: 2.54 minutes, Memory: 6.00MB

OK (4 tests, 65 assertions)

docker@cli:/var/www/core\$

DRUPAL TESTING WORKSHOP

DRUPAL BRISTOL, JUNE 2018

- ▶ **Module and theme developers**
- ▶ **Want to know more about automated testing**
- ▶ **Looking to start writing your first tests**

- ▶ **Full stack Web Developer & System Administrator**
- ▶ **Senior Developer at Microserve**
- ▶ **Part-time freelancer**
- ▶ **Acquia certified Drupal 8 Grand Master**
- ▶ **Drupal 7 & 8 core contributor**
- ▶ **opdavies (Drupal.org, GitHub, Twitter)**
- ▶ **www.oliverdavies.uk**



TESTDRIVENDRUPAL.COM

WHY WRITE TESTS?

WHY WRITE TESTS?

- ▶ Catch bugs earlier
- ▶ Piece of mind
- ▶ Prevent regressions
- ▶ Write less code
- ▶ Documentation
- ▶ Drupal core requirement - <https://www.drupal.org/core/gates#testing>
- ▶ More important with regular D8 releases

**HAVING TESTS DOES NOT MEAN
THERE WILL BE NO BUGS**

**TESTING MAY ADD TIME NOW
BUT SAVE MORE TIME IN THE FUTURE**

TESTING IN DRUPAL

- ▶ **Drupal 7** - Simpletest (testing) module provided as part of core
- ▶ **Drupal 8** - PHPUnit added as a core dependency
- ▶ **PHPUnit Initiative** - Simpletest to be deprecated and removed in Drupal 9

EXERCISE 1

LOCAL SITE SETUP

DOCKSAL

- ▶ **Docker based local development environment**
- ▶ **Microserve standard**
- ▶ **Open source**
- ▶ **Per site configuration and customisation**
- ▶ **fin CLI, Apache, MySQL, Solr, Varnish, Mailhog, PHPMyAdmin etc**
- ▶ **Virtualbox or native Docker**
- ▶ **Can slow down tests**
- ▶ **Provides consistency**

- ▶ <https://github.com/opdavies/drupal-testing-workshop>
- ▶ <https://docksal.io/installation>
- ▶ `git clone`
- ▶ `fin init`
- ▶ <http://drupaltest.docksal>

EXERCISE 2

RUNNING TESTS

OPTION 1

SIMPLETEST MODULE (UI)

- ▶ ParamConverter
- ▶ path
- ▶ Path
- ▶ PathProcessor
- ▶ PhpStorage
- ▶ PHPUnit
- ▶ phpunit_example
- ▶ Plugin
- ▶ plugin_type_example
- ▶ PrivateKeyTest
- ▶ proxy_builder
- ▶ Queue
- ▶ queue_example
- ▶ quickedit
- ▶ rdf

- utility
- Uuid
- validation
- Validation
- Variable
- views
- Views
- views_ui
- workflows

Run tests

CLEAN TEST ENVIRONMENT
[Clean environment](#)
Remove tables with the prefix "test" followed by digits and temporary directories that are left over from tests that crashed. This is intended for developers when creating tests.

Running tests ☆



Running tests ☆

Processed test 1 of 4 - *Drupal\Tests\phpunit_example\Functional\PHPUnitExampleMenuTest.*

Overall results: 2 passes, 0 fails, 0 exceptions

- *Drupal\Tests\phpunit_example\Functional\PHPUnitExampleMenuTest*: 2 passes, 0 fails, 0 exceptions



25%

Running tests ☆

Processed test 4 of 4 - *Drupal\Tests\phpunit_example\Unit\ProtectedPrivatesTest*.

Overall results: 34 passes, 0 fails, 0 exceptions

- *Drupal\Tests\phpunit_example\Unit\ProtectedPrivatesTest*: 4 passes, 0 fails, 0 exceptions
- *Drupal\Tests\phpunit_example\Unit\DisplayManagerTest*: 1 pass, 0 fails, 0 exceptions
- *Drupal\Tests\phpunit_example\Unit\AddClassTest*: 27 passes, 0 fails, 0 exceptions
- *Drupal\Tests\phpunit_example\Functional\PHPUnitExampleMenuTest*: 2 passes, 0 fails, 0 exceptions



100%

Test result

[Home](#) » [Administration](#) » [Configuration](#) » [Development](#) » [Testing](#)

✓ The test run finished in 1 min 19 sec.

ACTIONS
Filter: All (4) ▾ Run tests [Return to list](#)

RESULTS
34 passes, 0 fails, 0 exceptions

- ▶ `Drupal\Tests\phpunit_example\Functional\PHPUnitExampleMenuTest`
- ▶ `Drupal\Tests\phpunit_example\Unit\AddClassTest`
- ▶ `Drupal\Tests\phpunit_example\Unit\DisplayManagerTest`
- ▶ `Drupal\Tests\phpunit_example\Unit\ProtectedPrivatesTest`

▼ Drupal\Tests\phpunit_example\Unit\AddClassTest

AddClass units tests.
27 passes, 0 fails, 0 exceptions

MESSAGE	GROUP	FILENAME	LINE	FUNCTION	STATUS
	Other	AddClassTest.php	46	Drupal\Tests\phpunit_example\Unit\AddClassTest->testAdd()	✓
	Other	AddClassTest.php	87	Drupal\Tests\phpunit_example\Unit\AddClassTest->testAddWithDataProvider with data set #0()	✓
	Other	AddClassTest.php	87	Drupal\Tests\phpunit_example\Unit\AddClassTest->testAddWithDataProvider with data set #1()	✓
	Other	AddClassTest.php	114	Drupal\Tests\phpunit_example\Unit\AddClassTest->testAddWithBadDataProvider with data set #0()	✓
	Other	AddClassTest.php	114	Drupal\Tests\phpunit_example\Unit\AddClassTest->testAddWithBadDataProvider with data set #1()	✓
	Other	AddClassTest.php	114	Drupal\Tests\phpunit_example\Unit\AddClassTest->testAddWithBadDataProvider with data set #2()	✓
	Other	AddClassTest.php	114	Drupal\Tests\phpunit_example\Unit\AddClassTest->testAddWithBadDataProvider with data set #3()	✓
	Other	AddClassTest.php	114	Drupal\Tests\phpunit_example\Unit\AddClassTest->testAddWithBadDataProvider with data set #4()	✓
	Other	AddClassTest.php	114	Drupal\Tests\phpunit_example\Unit\AddClassTest->testAddWithBadDataProvider with data set #5()	✓
	Other	AddClassTest.php	114	Drupal\Tests\phpunit_example\Unit\AddClassTest->testAddWithBadDataProvider with data set #6()	✓
	Other	AddClassTest.php	114	Drupal\Tests\phpunit_example\Unit\AddClassTest->testAddWithBadDataProvider with data set #7()	✓
	Other	AddClassTest.php	114	Drupal\Tests\phpunit_example\Unit\AddClassTest->testAddWithBadDataProvider with data set #8()	✓

OPTION 2

COMMAND LINE

PREREQUISITE (CREATING A PHPUNIT.XML FILE)

- ▶ **Configures PHPUnit**
- ▶ **Needed to run some types of tests**
- ▶ **Ignored by Git by default**
- ▶ **Copy `core/phpunit.xml.dist` to `core/phpunit.xml`**
- ▶ **Add and change as needed**
 - ▶ `SIMPLETEST_BASE_URL, SIMPLETEST_DB, BROWSERTEST_OUTPUT_DIRECTORY`
 - ▶ `stopOnFailure="true"`

```
cd web
```

```
../vendor/bin/phpunit -c core \  
modules/contrib/examples/phpunit_example
```



```
cd web/core
```

```
../../../../vendor/bin/phpunit \
```

```
../modules/contrib/examples/phpunit_example
```

PRO-TIP: ADD PATHS TO \$PATH

```
# ~/.zshrc
```

```
export PATH=$HOME/bin:/usr/local/bin:$PATH
```

```
export PATH=vendor/bin:$PATH
```

```
export PATH=./vendor/bin:$PATH
```

```
export PATH=node_modules/.bin:$PATH
```

OPTION 2

CLI WITH DOCKSAL

```
fin bash
```

```
cd web
```

```
../vendor/bin/phpunit -c core \  
modules/contrib/examples/phpunit_example
```

```
fin bash
```

```
cd web/core
```

```
../../../../vendor/bin/phpunit \
```

```
../../../../modules/contrib/examples/phpunit_example
```

OPTION 3

DOCKSAL PHPUNIT ADDON

- ▶ **Custom Docksal command**
- ▶ **Submitted to the Docksal addons repo**
- ▶ **fin addon install phpunit**
- ▶ **Wrapper around phpunit command**
- ▶ **Copies a stub phpunit.xml file if exists, or duplicates phpunit.xml.dist**
- ▶ **Shorter command, combines two actions**

```
fin phpunit web/modules/contrib/examples/phpunit_example
```



```
fin phpunit web/modules/contrib/examples/phpunit_example
```

```
Copying /var/www/.docksal/drupal/core/phpunit.xml to /var/www/web/core/phpunit.xml  
PHPUnit 6.5.8 by Sebastian Bergmann and contributors.
```

```
Testing web/modules/contrib/examples/phpunit_example
```

```
..... 34 / 34 (100%)
```

```
Time: 46.8 seconds, Memory: 6.00MB
```

```
OK (34 tests, 41 assertions)
```

```
fin phpunit web/modules/contrib/examples/phpunit_example
```

Copying /var/www/web/core/phpunit.xml.dist to /var/www/web/core/phpunit.xml.
Please edit it's values as needed and re-run 'fin phpunit'.

```
fin phpunit web/modules/contrib/examples/phpunit_example
```

```
PHPUnit 6.5.8 by Sebastian Bergmann and contributors.
```

```
Testing web/modules/contrib/examples/phpunit_example
```

```
..... 34 / 34 (100%)
```

```
Time: 48.62 seconds, Memory: 6.00MB
```

```
OK (34 tests, 41 assertions)
```

OPTION 4

IDE/TEXT EDITOR

INTEGRATION

```
drupal-testing-workshop [~/Code/os/drupal-testing-workshop] - .../web/modules/contrib/examples/phpunit_example/tests/src/Functional/PHPUnitExampleMenuTest.php [drupal-testing-workshop]

Project
├── js_example
├── menu_example
├── node_type_example
├── page_example
├── pager_example
├── phpunit_example
│   ├── src
│   └── templates
├── tests
│   ├── src
│   │   ├── Functional
│   │   │   └── PHPUnitExampleMenuTest.php
│   │   └── Unit
│   │       ├── Subclasses
│   │       │   ├── AddClassTest.php
│   │       │   ├── DisplayManagerTest.php
│   │       │   └── ProtectedPrivatesTest.php
│   │       ├── phpunit_example.info.yml
│   │       ├── phpunit_example.links.menu.yml
│   │       ├── phpunit_example.module
│   │       └── phpunit_example.routing.yml
│   └── plugin_type_example
```

```
57     $this->drupalGet($page);
58     $this->assertLinkByHref($path);
59 }
60 }
61
62 /**
63  * Tests phpunit_example menus.
64 */
65 public function testPhpUnitExampleMenu() {
66     $this->drupalGet('/examples/phpunit-example');
67     $this->assertResponse(200, 'Description page exists.');
```

Run: tests x

Tests passed: 34 of 34 tests – 29 s 240 ms

✓	/var/www/web/modules/contrib/exa	29 s 240 ms
✓	Drupal\Tests\phpunit_example\Fu	29 s 60 ms
✓	testPhpUnitExampleLink	15 s 570 ms
✓	testPhpUnitExampleMenu	13 s 490 ms
▶	Drupal\Tests\phpunit_example\Unit\A	40 ms
✓	Drupal\Tests\phpunit_example\Unit\	120 ms
✓	testSimpleMockDisplayManager	120 ms
✓	Drupal\Tests\phpunit_example\Unit\P	20 ms
▶	testPrivateAdd	10 ms
▶	testPrivateAddBadData	0 ms
✓	testProtectedAdd	10 ms
✓	with data set #0	10 ms
✓	testProtectedAddBadData	0 ms
✓	with data set #0	0 ms

Time: 46.62 seconds, Memory: 6.00MB

OK (34 tests, 41 assertions)

Process finished with exit code 0

TYPES OF TESTS

1. ARRANGE

2. ACT

3. ASSERT

FUNCTIONAL TESTS

- ▶ **Tests functionality**
- ▶ **Interacts with database**
- ▶ **Full Drupal installation**
- ▶ **Slower to run**
- ▶ **With/without JavaScript**

EXERCISE

**LET'S WRITE A
FUNCTIONAL TEST**

- ▶ Create a `web/modules/custom/drupalbristol` directory
- ▶ Create a `drupalbristol.info.yml` file

```
# drupalbristol.info.yml
```

```
name: Drupal Bristol
```

```
core: 8.x
```

```
type: module
```

- ▶ Create a **tests/src/Functional** directory
- ▶ Create an **ExampleFunctionalTest.php** file

```
// ExampleFunctionalTest.php

namespace Drupal\Tests\drupalbristol\Functional;

use Drupal\Tests\BrowserTestBase;

class ExampleFunctionalTest extends BrowserTestBase {

}
```

```
// ExampleFunctionalTest.php
```

```
public function testExamplePage() {
```

```
    $this->drupalGet('/example-one');
```

```
    $this->assertSession()->statusCodeEquals(200);
```

```
}
```

PHPUnit 6.5.8 by Sebastian Bergmann and contributors.

Testing Drupal\Tests\drupalbristol\Functional\ExampleFunctionalTest

Behat\Mink\Exception\ExpectationException : Current response status code is 404, but 200 expected.

/var/www/vendor/behata/mink/src/WebAssert.php:768

/var/www/vendor/behata/mink/src/WebAssert.php:130

/var/www/web/modules/custom/drupalbristol/tests/src/Functional/ExampleFunctionalTest.php:14

Time: 18.2 seconds, Memory: 6.00MB

ERRORS!

Tests: 1, Assertions: 2, Errors: 1.

- ▶ Create a **drupalbristol.routing.yml** file
- ▶ Create a Controller


```
# drupalbristol.routing.yml
```

```
drupalbristol.example:
```

```
  path: '/example-one'
```

```
  defaults:
```

```
    _controller: 'Drupal\drupalbristol\Controllers\ExampleController::index'
```

```
  requirements:
```

```
    _access: 'TRUE'
```

```
// src/Controllers/ExampleController.php

namespace Drupal\drupalbristol\Controllers;

use Drupal\Core\Controller\ControllerBase;

class ExampleController extends ControllerBase {

    public function index() {
        return ['#markup' => $this->t('Drupal Testing Workshop')];
    }

}
```

```
class ExampleFunctionalTest extends BrowserTestBase {  
    protected static $modules = ['drupalbristol'];  
  
    ...  
}
```

KERNEL TESTS

- ▶ **Integration tests**
- ▶ **Can install modules, interact with services, container, database**
- ▶ **Minimal Drupal bootstrap**
- ▶ **Faster than functional tests**
- ▶ **More setup required**

EXERCISE

**LET'S WRITE A
KERNEL TEST**

- ▶ Create a `_tests/src/Kernel` directory
- ▶ Create an `ExampleKernelTest.php` file
- ▶ Create a Service
- ▶ Use the service within the test to perform an action

```
// tests/src/Kernel/ExampleKernelTest.php

namespace Drupal\Tests\drupalbristol\Kernel;

use Drupal\KernelTests\Core\Entity\EntityKernelTestBase;
use Drupal\user\Entity\User;

class ExampleKernelTest extends EntityKernelTestBase {

    public static $modules = ['drupalbristol'];

    public function testUserDeleter() {

    }

}
```

```
// tests/src/Kernel/ExampleKernelTest.php
```

```
public function testUserDeleter {
```

```
    $user = $this->createUser();
```

```
    $this->assertInstanceOf(User::class, $user);
```

```
    /** @var \Drupal\drupalbristol\Services\UserDeleter $user_deleter */
```

```
    $user_deleter = \Drupal::service('drupalbristol.user_deleter');
```

```
    $user_deleter->delete($user);
```

```
    $user = $this->reloadEntity($user);
```

```
    $this->assertNull($user);
```

```
}
```


PHPUnit 6.5.8 by Sebastian Bergmann and contributors.

Testing Drupal\Tests\drupalbristol\Kernel\ExampleKernelTest

```
Symfony\Component\DependencyInjection\Exception\ServiceNotFoundException : You have requested a non-existent service "drupalbristol.user_deleter".  
  /var/www/vendor/symfony/dependency-injection/ContainerBuilder.php:1043  
  /var/www/vendor/symfony/dependency-injection/ContainerBuilder.php:610  
  /var/www/vendor/symfony/dependency-injection/ContainerBuilder.php:588  
  /var/www/web/core/lib/Drupal.php:159  
  /var/www/web/modules/custom/drupalbristol/tests/src/Kernel/ExampleKernelTest.php:24
```

Time: 7.06 seconds, Memory: 6.00MB

ERRORS!

Tests: 1, Assertions: 3, Errors: 1.

Process finished with exit code 2

```
# drupalbristol.services.yml
```

```
services:
```

```
  drupalbristol.user_deleter:
```

```
    class: 'Drupal\drupalbristol\Services\UserDeleter'
```

```
    arguments: []
```

```
// src/Services/UserDeleter.php

namespace Drupal\drupalbristol\Services;

use Drupal\Core\Session\AccountInterface;

class UserDeleter {

    public function delete(AccountInterface $user) {
        user_delete($user->id());
    }

}
```

PHPUnit 6.5.8 by Sebastian Bergmann and contributors.

Testing Drupal\Tests\drupalbristol\Kernel\ExampleKernelTest

Drupal\Core\Entity\EntityStorageException : SQLSTATE[HY000]: General error: 1 no such table: test89378988.users_data: DELETE FROM {users_data} WHERE uid IN (:db_condition_placeholder_0); Array

```
(  
    [:db_condition_placeholder_0] => 1  
)
```

```
/var/www/web/core/lib/Drupal/Core/Entity/Sql/SqlContentEntityStorage.php:777  
/var/www/web/core/includes/entity.inc:281  
/var/www/web/core/modules/user/user.module:878  
/var/www/web/core/modules/user/user.module:865  
/var/www/web/modules/custom/drupalbristol/src/Services/UserDeleter.php:10  
/var/www/web/modules/custom/drupalbristol/tests/src/Kernel/ExampleKernelTest.php:25
```

Caused by

Drupal\Core\Database\DatabaseExceptionWrapper: SQLSTATE[HY000]: General error: 1 no such table: test89378988.users_data: DELETE FROM {users_data} WHERE uid IN (:db_condition_placeholder_0); Array

```
(  
    [:db_condition_placeholder_0] => 1  
)
```

Time: 6.55 seconds, Memory: 6.00MB

ERRORS!

Tests: 1, Assertions: 3, Errors: 1.

Process finished with exit code 2

```
// tests/src/Kernel/ExampleKernelTest.php
```

```
protected function setUp() {
```

```
    parent::setUp();
```

```
    $this->installSchema('user', ['users_data']);
```

```
}
```

PHPUnit 6.5.8 by Sebastian Bergmann and contributors.

Testing Drupal\Tests\drupalbristol\Kernel\ExampleKernelTest

Time: 7.38 seconds, Memory: 6.00MB

OK (1 test, 5 assertions)

Process finished with exit code 0

UNIT TESTS

- ▶ **Tests PHP logic**
- ▶ **No database interaction**
- ▶ **Fast to run**
- ▶ **Tightly coupled**
- ▶ **Mocking dependencies**
- ▶ **Hard to refactor**

EXERCISE

**LET'S WRITE A
UNIT TEST**


```
// tests/src/Unit/Services/ExampleUnitTest.php

namespace Drupal\Tests\drupalbristol\Unit;

use Drupal\Tests\UnitTestCase;

class ExampleUnitTest extends UnitTestCase {

    public function testAdd() {
        $this->assertEquals(5, (new Calculator(3))->add(2)->calculate());
    }
}
```

PHPUnit 6.5.8 by Sebastian Bergmann and contributors.

Testing Drupal\Tests\drupalbristol\Unit\ExampleUnitTest

Error : Class 'Drupal\Tests\drupalbristol\Unit\Calculator' not found
/var/www/web/modules/custom/drupalbristol/tests/src/Unit/Services/ExampleUnitTest.php:10

Time: 5.13 seconds, Memory: 6.00MB

ERRORS!

Tests: 1, Assertions: 0, Errors: 1.

```
// src/Services/Calculator.php

namespace Drupal\drupalbristol\Services;

class Calculator {

    private $total;

    public function __construct($value) {
        $this->total = $value;
    }

    public function add($value) {
        $this->total += $value;

        return $this;
    }

    public function calculate() {
        return $this->total;
    }

}
```

```
// tests/src/Unit/Services/ExampleUnitTest.php

namespace Drupal\Tests\drupalbristol\Unit;

use Drupal\drupalbristol\Services\Calculator;
use Drupal\Tests\UnitTestCase;

class ExampleUnitTest extends UnitTestCase {

    public function testAdd() {
        $this->assertEquals(5, (new Calculator(3))->add(2)->calculate());
    }

}
```

PHPUnit 6.5.8 by Sebastian Bergmann and contributors.

Testing Drupal\Tests\drupalbristol\Unit\ExampleUnitTest

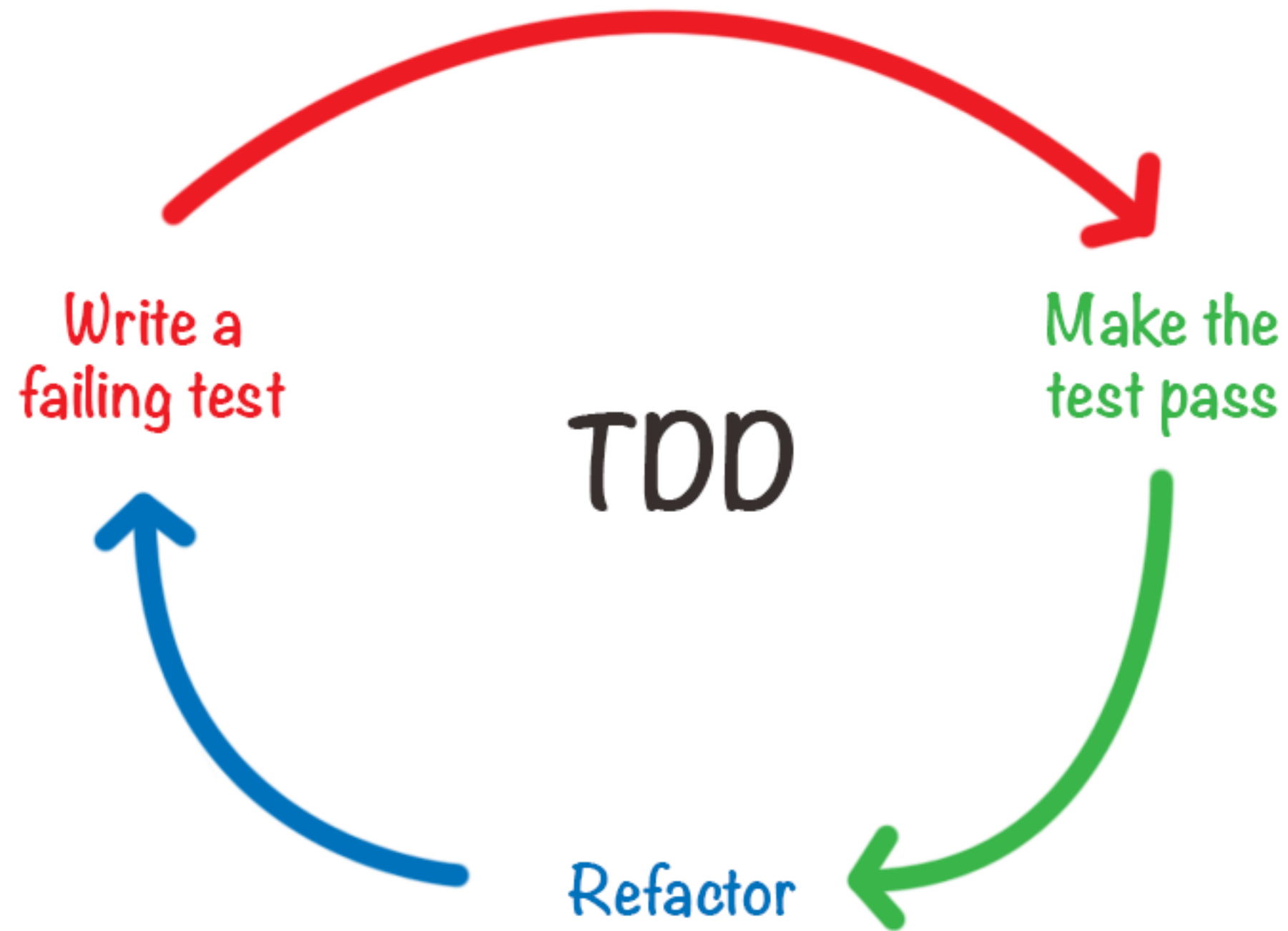
Time: 4.55 seconds, Memory: 4.00MB

OK (1 test, 1 assertion)

TEST DRIVEN DEVELOPMENT (TDD)

TEST DRIVEN DEVELOPMENT

- ▶ **Write a test**
- ▶ **Test fails**
- ▶ **Write code**
- ▶ **Test passes**
- ▶ **Refactor**
- ▶ **Repeat**



HOW I WRITE TESTS - "OUTSIDE IN"

- ▶ **Start with functional tests**
- ▶ **Drop down to kernel or unit tests where needed**
- ▶ **Programming by wishful thinking**
- ▶ **Write comments first, then fill in the code**
- ▶ **Sometimes write assertions first**

EXERCISE

**LET'S BUILD A BLOG USING
TEST DRIVEN DEVELOPMENT**

ACCEPTANCE CRITERIA

- ▶ **As a site visitor**
- ▶ **I want to see a list of published articles at /blog**
- ▶ **Ordered by post date**

TASKS

- ▶ **Ensure the blog page exists**
- ▶ **Ensure only published articles are shown**
- ▶ **Ensure the articles are shown in the correct order**

IMPLEMENTATION

- ▶ **Use views module**
- ▶ **Do the minimum amount at each step, make no assumptions, let the tests guide us**
- ▶ **Start with functional test**

STEP 1

CREATE THE MODULE

```
# tdd_blog.info.yml
```

```
name: 'TDD Blog'
```

```
core: '8.x'
```

```
type: 'module'
```

STEP 2

**ENSURE THE BLOG PAGE
EXISTS**


```
<?php
```

```
// tests/src/Functional/BlogPageTest.php
```

```
namespace Drupal\Tests\tdd_blog\Functional;
```

```
use Drupal\Tests\BrowserTestBase;
```

```
class BlogPageTest extends BrowserTestBase {
```

```
    protected static $modules = ['tdd_blog'];
```

```
    public function testBlogPageExists() {
```

```
        $this->drupalGet('/blog');
```

```
        $this->assertSession()->statusCodeEquals(200);
```

```
    }
```

```
}
```



```
<?php
```

```
// tests/src/Functional/BlogPageTest.php
```

```
namespace Drupal\Tests\tdd_blog\Functional;
```

```
use Drupal\Tests\BrowserTestBase;
```

```
class BlogPageTest extends BrowserTestBase {
```

```
    protected static $modules = ['tdd_blog'];
```

```
    public function testBlogPageExists() {
```

```
        $this->drupalGet('/blog');
```

```
        $this->assertSession()->statusCodeEquals(200);
```

```
    }
```

```
}
```

```
<?php

// tests/src/Functional/BlogPageTest.php

namespace Drupal\Tests\tdd_blog\Functional;

use Drupal\Tests\BrowserTestBase;

class BlogPageTest extends BrowserTestBase {

    protected static $modules = ['tdd_blog'];

    public function testBlogPageExists() {
        $this->drupalGet('/blog');

        $this->assertSession()->statusCodeEquals(200);
    }

}
```

```
docker@cli:/var/www/web$ ../vendor/bin/phpunit -c core modules/custom/tdd_blog
PHPUnit 6.5.8 by Sebastian Bergmann and contributors.
```

```
Testing modules/custom/tdd_blog
```

```
E                                                                    1 / 1 (100%)
```

```
Time: 19.31 seconds, Memory: 6.00MB
```

```
There was 1 error:
```

```
1) Drupal\Tests\tdd_blog\Functional\BlogPageTest::testBlogPageExists
Behat\Mink\Exception\ExpectationException: Current response status code is 404, but 200 expected.
```

```
/var/www/vendor/behat/mink/src/WebAssert.php:768
```

```
/var/www/vendor/behat/mink/src/WebAssert.php:130
```

```
/var/www/web/modules/custom/tdd_blog/tests/src/Functional/BlogPageTest.php:13
```

```
ERRORS!
```

```
Tests: 1, Assertions: 3, Errors: 1.
```

```
docker@cli:/var/www/web$ ../vendor/bin/phpunit -c core modules/custom/tdd_blog
PHPUnit 6.5.8 by Sebastian Bergmann and contributors.
```

```
Testing modules/custom/tdd_blog
```

```
E                                                                    1 / 1 (100%)
```

```
Time: 19.31 seconds, Memory: 6.00MB
```

```
There was 1 error:
```

```
1) Drupal\Tests\tdd_blog\Functional\BlogPageTest::testBlogPageExists
Behat\Mink\Exception\ExpectationException: Current response status code is 404, but 200 expected.
```

```
/var/www/vendor/behat/mink/src/WebAssert.php:768
```

```
/var/www/vendor/behat/mink/src/WebAssert.php:130
```

```
/var/www/web/modules/custom/tdd_blog/tests/src/Functional/BlogPageTest.php:13
```

```
ERRORS!
```

```
Tests: 1, Assertions: 3, Errors: 1.
```

```
docker@cli:/var/www/web$ ../vendor/bin/phpunit -c core modules/custom/tdd_blog
PHPUnit 6.5.8 by Sebastian Bergmann and contributors.
```

```
Testing modules/custom/tdd_blog
```

```
E 1 / 1 (100%)
```

```
Time: 19.31 seconds, Memory: 6.00MB
```

```
There was 1 error:
```

```
1) Drupal\Tests\tdd_blog\Functional\BlogPageTest::testBlogPageExists
Behat\Mink\Exception\ExpectationException: Current response status code is 404, but 200 expected.
```

```
/var/www/vendor/behat/mink/src/WebAssert.php:768
```

```
/var/www/vendor/behat/mink/src/WebAssert.php:130
```

```
/var/www/web/modules/custom/tdd_blog/tests/src/Functional/BlogPageTest.php:13
```

```
ERRORS!
```

```
Tests: 1, Assertions: 3, Errors: 1.
```



```
docker@cli:/var/www/web$ ../vendor/bin/phpunit -c core modules/custom/tdd_blog
PHPUnit 6.5.8 by Sebastian Bergmann and contributors.
```

```
Testing modules/custom/tdd_blog
```

```
E                                                                    1 / 1 (100%)
```

```
Time: 19.31 seconds, Memory: 6.00MB
```

```
There was 1 error:
```

```
1) Drupal\Tests\tdd_blog\Functional\BlogPageTest::testBlogPageExists
Behat\Mink\Exception\ExpectationException: Current response status code is 404, but 200 expected.
```

```
/var/www/vendor/behat/mink/src/WebAssert.php:768
```

```
/var/www/vendor/behat/mink/src/WebAssert.php:130
```

```
/var/www/web/modules/custom/tdd_blog/tests/src/Functional/BlogPageTest.php:13
```

```
ERRORS!
```

```
Tests: 1, Assertions: 3, Errors: 1.
```

```
docker@cli:/var/www/web$ ../vendor/bin/phpunit -c core modules/custom/tdd_blog
PHPUnit 6.5.8 by Sebastian Bergmann and contributors.
```

```
Testing modules/custom/tdd_blog
```

```
E                                                                    1 / 1 (100%)
```

```
Time: 19.31 seconds, Memory: 6.00MB
```

```
There was 1 error:
```

```
1) Drupal\Tests\tdd_blog\Functional\BlogPageTest::testBlogPageExists
Behat\Mink\Exception\ExpectationException: Current response status code is 404, but 200 expected.
```

```
/var/www/vendor/behat/mink/src/WebAssert.php:768
```

```
/var/www/vendor/behat/mink/src/WebAssert.php:130
```

```
/var/www/web/modules/custom/tdd_blog/tests/src/Functional/BlogPageTest.php:13
```

```
ERRORS!
```

```
Tests: 1, Assertions: 3, Errors: 1.
```

- ▶ **The view has not been created**
- ▶ **Create a new view**
- ▶ **Set the path**
- ▶ **Export the config**
- ▶ **Copy it into the module's `config/install` directory**

```
docker@cli:/var/www/web$ ../vendor/bin/phpunit -c core modules/custom/tdd_blog
PHPUnit 6.5.8 by Sebastian Bergmann and contributors.
```

```
Testing modules/custom/tdd_blog
```

```
E                                                                    1 / 1 (100%)
```

```
Time: 16.02 seconds, Memory: 6.00MB
```

```
There was 1 error:
```

```
1) Drupal\Tests\tdd_blog\Functional\BlogPageTest::testBlogPageExists
```

```
Drupal\Core\Config\UnmetDependenciesException: Configuration objects provided by <em class="placeholder">tdd_blog</em>
have unmet dependencies: <em class="placeholder">views.view.blog (node.type.article, node, views)</em>
```

```
/var/www/web/core/lib/Drupal/Core/Config/UnmetDependenciesException.php:98
```

```
/var/www/web/core/lib/Drupal/Core/Config/ConfigInstaller.php:469
```

```
/var/www/web/core/lib/Drupal/Core/ProxyClass/Config/ConfigInstaller.php:132
```

```
/var/www/web/core/lib/Drupal/Core/Extension/ModuleInstaller.php:145
```

```
/var/www/web/core/lib/Drupal/Core/ProxyClass/Extension/ModuleInstaller.php:83
```

```
/var/www/web/core/lib/Drupal/Core/Test/FunctionalTestSetupTrait.php:437
```

```
/var/www/web/core/tests/Drupal/Tests/BrowserTestBase.php:1055
```

```
/var/www/web/core/tests/Drupal/Tests/BrowserTestBase.php:490
```

```
ERRORS!
```

```
Tests: 1, Assertions: 0, Errors: 1.
```

```
# tdd_blog.info.yml
```

```
name: 'TDD Dublin'
```

```
description: 'A demo module to show test driven module development.'
```

```
core: 8.x
```

```
type: module
```

```
dependencies:
```

- 'drupal:node'
- 'drupal:views'

```
docker@cli:/var/www/web$ ../vendor/bin/phpunit -c core modules/custom/tdd_blog
PHPUnit 6.5.8 by Sebastian Bergmann and contributors.
```

```
Testing modules/custom/tdd_blog
```

```
E                                                                    1 / 1 (100%)
```

```
Time: 20 seconds, Memory: 6.00MB
```

```
There was 1 error:
```

```
1) Drupal\Tests\tdd_blog\Functional\BlogPageTest::testBlogPageExists
```

```
Drupal\Core\Config\UnmetDependenciesException: Configuration objects provided by <em class="placeholder">tdd_blog</em>
have unmet dependencies: <em class="placeholder">views.view.blog (node.type.article)</em>
```

```
/var/www/web/core/lib/Drupal/Core/Config/UnmetDependenciesException.php:98
```

```
/var/www/web/core/lib/Drupal/Core/Config/ConfigInstaller.php:469
```

```
/var/www/web/core/lib/Drupal/Core/ProxyClass/Config/ConfigInstaller.php:132
```

```
/var/www/web/core/lib/Drupal/Core/Extension/ModuleInstaller.php:145
```

```
/var/www/web/core/lib/Drupal/Core/ProxyClass/Extension/ModuleInstaller.php:83
```

```
/var/www/web/core/lib/Drupal/Core/Test/FunctionalTestSetupTrait.php:437
```

```
/var/www/web/core/tests/Drupal/Tests/BrowserTestBase.php:1055
```

```
/var/www/web/core/tests/Drupal/Tests/BrowserTestBase.php:490
```

```
ERRORS!
```

```
Tests: 1, Assertions: 0, Errors: 1.
```

▶ **Add the article content type**

```
docker@cli:/var/www/web$ ../vendor/bin/phpunit -c core modules/custom/tdd_blog
PHPUnit 6.5.8 by Sebastian Bergmann and contributors.
```

```
Testing modules/custom/tdd_blog
```

```
. 1 / 1 (100%)
```

```
Time: 23.36 seconds, Memory: 6.00MB
```

```
OK (1 test, 3 assertions)
```


TASKS

- ▶ ~~Ensure the blog page exists~~
- ▶ Ensure only published articles are shown
- ▶ Ensure the articles are shown in the correct order

STEP 3

**ENSURE ONLY PUBLISHED
ARTICLES ARE SHOWN**

```
public function testOnlyPublishedArticlesAreShown() {  
    // Given I have a mixture of published and unpublished articles,  
    // as well as other types of content.  
  
    // When I view the blog page.  
  
    // I should only see the published articles.  
}
```

OPTION 1

FUNCTIONAL TESTS

```
// modules/custom/tdd_blog/tests/src/Functional/BlogPageTest.php

public function testOnlyPublishedArticlesAreShown() {
    // Given I have a mixture of published and unpublished articles,
    // as well as other types of content.
    $node1 = $this->drupalCreateNode(['type' => 'page', 'status' => 1]);
    $node2 = $this->drupalCreateNode(['type' => 'article', 'status' => 1]);
    $node3 = $this->drupalCreateNode(['type' => 'article', 'status' => 0]);

    // When I view the blog page.
    $this->drupalGet('/blog');

    // I should only see the published articles.
    $assert = $this->assertSession();
    $assert->pageTextContains($node2->label());
    $assert->pageTextNotContains($node1->label());
    $assert->pageTextNotContains($node3->label());
}
```

```
// modules/custom/tdd_blog/tests/src/Functional/BlogPageTest.php

public function testOnlyPublishedArticlesAreShown() {
    // Given I have a mixture of published and unpublished articles,
    // as well as other types of content.
    $node1 = $this->drupalCreateNode(['type' => 'page', 'status' => 1]);
    $node2 = $this->drupalCreateNode(['type' => 'article', 'status' => 1]);
    $node3 = $this->drupalCreateNode(['type' => 'article', 'status' => 0]);

    // When I view the blog page.
    $this->drupalGet('/blog');

    // I should only see the published articles.
    $assert = $this->assertSession();
    $assert->pageTextContains($node2->label());
    $assert->pageTextNotContains($node1->label());
    $assert->pageTextNotContains($node3->label());
}
```

```
// modules/custom/tdd_blog/tests/src/Functional/BlogPageTest.php

public function testOnlyPublishedArticlesAreShown() {
    // Given I have a mixture of published and unpublished articles,
    // as well as other types of content.
    $node1 = $this->drupalCreateNode(['type' => 'page', 'status' => 1]);
    $node2 = $this->drupalCreateNode(['type' => 'article', 'status' => 1]);
    $node3 = $this->drupalCreateNode(['type' => 'article', 'status' => 0]);

    // When I view the blog page.
    $this->drupalGet('/blog');

    // I should only see the published articles.
    $assert = $this->assertSession();
    $assert->pageTextContains($node2->label());
    $assert->pageTextNotContains($node1->label());
    $assert->pageTextNotContains($node3->label());
}
```

OPTION 2

KERNEL TESTS


```
<?php
```

```
namespace Drupal\Tests\tdd_blog\Kernel;
```

```
use Drupal\KernelTests\Core\Entity\EntityKernelTestBase;
```

```
use Drupal\Tests\node\Traits\NodeCreationTrait;
```

```
class BlogPageTest extends EntityKernelTestBase {
```

```
    use NodeCreationTrait;
```

```
    public static $modules = ['node'];
```

```
    public function testOnlyPublishedArticlesAreShown() {
```

```
        $this->createNode(['type' => 'page', 'status' => 1]);
```

```
        $this->createNode(['type' => 'article', 'status' => 1]);
```

```
        $this->createNode(['type' => 'article', 'status' => 0]);
```

```
    }
```

```
}
```

```
<?php
```

```
namespace Drupal\Tests\tdd_blog\Kernel;
```

```
use Drupal\KernelTests\Core\Entity\EntityKernelTestBase;
```

```
use Drupal\Tests\node\Traits\NodeCreationTrait;
```

```
class BlogPageTest extends EntityKernelTestBase {
```

```
    use NodeCreationTrait;
```

```
    public static $modules = ['node'];
```

```
    public function testOnlyPublishedArticlesAreShown() {
```

```
        $this->createNode(['type' => 'page', 'status' => 1]);
```

```
        $this->createNode(['type' => 'article', 'status' => 1]);
```

```
        $this->createNode(['type' => 'article', 'status' => 0]);
```

```
    }
```

```
}
```



```
<?php
```

```
namespace Drupal\Tests\tdd_blog\Kernel;
```

```
use Drupal\KernelTests\Core\Entity\EntityKernelTestBase;
```

```
use Drupal\Tests\node\Traits\NodeCreationTrait;
```

```
class BlogPageTest extends EntityKernelTestBase {
```

```
    use NodeCreationTrait;
```

```
    public static $modules = ['node'];
```

```
    public function testOnlyPublishedArticlesAreShown() {
```

```
        $this->createNode(['type' => 'page', 'status' => 1]);
```

```
        $this->createNode(['type' => 'article', 'status' => 1]);
```

```
        $this->createNode(['type' => 'article', 'status' => 0]);
```

```
    }
```

```
}
```

```
docker@cli:/var/www/web$ ../vendor/bin/phpunit -c core/modules/custom/tdd_blog/tests/src/Kernel/
PHPUnit 6.5.8 by Sebastian Bergmann and contributors.
```

```
Testing modules/custom/tdd_blog/tests/src/Kernel/
E                                                    1 / 1 (100%)
```

```
Time: 6.22 seconds, Memory: 6.00MB
```

There was 1 error:

1) Drupal\Tests\tdd_blog\Kernel\BlogPageTest::testOnlyPublishedArticlesAreShown
Error: Call to a member function id() on boolean

```
/var/www/web/core/modules/filter/filter.module:212
```

```
/var/www/web/core/modules/node/tests/src/Traits/NodeCreationTrait.php:73
```

```
/var/www/web/modules/custom/tdd_blog/tests/src/Kernel/BlogPageTest.php:13
```

ERRORS!

```
Tests: 1, Assertions: 2, Errors: 1.
```

```
public function testOnlyPublishedArticlesAreShown() {  
    $this->installConfig(['filter']);  
  
    $this->createNode(['type' => 'page', 'status' => 1]);  
    $this->createNode(['type' => 'article', 'status' => 1]);  
    $this->createNode(['type' => 'article', 'status' => 0]);  
}
```

```
public function testOnlyPublishedArticlesAreShown() {
    $this->installConfig(['filter']);

    $this->createNode(['type' => 'page', 'status' => 1]);
    $this->createNode(['type' => 'article', 'status' => 1]);
    $this->createNode(['type' => 'article', 'status' => 0]);

    $results = views_get_view_result('blog');
}
```

...

```
public static $modules = ['node', 'tdd_blog', 'views'];

public function testOnlyPublishedArticlesAreShown() {
    $this->installConfig(['filter', 'tdd_blog']);

    $this->createNode(['type' => 'page', 'status' => 1]);
    $this->createNode(['type' => 'article', 'status' => 1]);
    $this->createNode(['type' => 'article', 'status' => 0]);

    $results = views_get_view_result('blog');

    $this->assertCount(1, $results);
    $this->assertEquals(2, $results[0]->_entity->id());
}
```


...

```
public static $modules = ['node', 'tdd_blog', 'views'];

public function testOnlyPublishedArticlesAreShown() {
    $this->installConfig(['filter', 'tdd_blog']);

    $this->createNode(['type' => 'page', 'status' => 1]);
    $this->createNode(['type' => 'article', 'status' => 1]);
    $this->createNode(['type' => 'article', 'status' => 0]);

    $results = views_get_view_result('blog');

    $this->assertCount(1, $results);
    $this->assertEquals(2, $results[0]->_entity->id());
}
```

...

```
public static $modules = ['node', 'tdd_blog', 'views'];

public function testOnlyPublishedArticlesAreShown() {
    $this->installConfig(['filter', 'tdd_blog']);

    $this->createNode(['type' => 'page', 'status' => 1]);
    $this->createNode(['type' => 'article', 'status' => 1]);
    $this->createNode(['type' => 'article', 'status' => 0]);

    $results = views_get_view_result('blog');

    $this->assertCount(1, $results);
    $this->assertEquals(2, $results[0]->_entity->id());
}
```

PHPUnit 6.5.8 by Sebastian Bergmann and contributors.

Testing web/modules/custom/tdd_blog/tests/src/Kernel

F

1 / 1 (100%)

Time: 2.16 seconds, Memory: 6.00MB

There was 1 failure:

1) Drupal\Tests\tdd_blog\Kernel\BlogPageTest::testOnlyPublishedArticlesAreShown

Failed asserting that actual size 3 matches expected size 1.

/Users/opdavies/Code/drupal-testing-workshop/web/modules/custom/tdd_blog/tests/src/Kernel/BlogPageTest.php:23

FAILURES!

Tests: 1, Assertions: 4, Failures: 1.

PHPUnit 6.5.8 by Sebastian Bergmann and contributors.

Testing web/modules/custom/tdd_blog/tests/src/Kernel

F

1 / 1 (100%)

Time: 2.16 seconds, Memory: 6.00MB

There was 1 failure:

1) Drupal\Tests\tdd_blog\Kernel\BlogPageTest::testOnlyPublishedArticlesAreShown

Failed asserting that actual size 3 matches expected size 1.

/Users/opdavies/Code/drupal-testing-workshop/web/modules/custom/tdd_blog/tests/src/Kernel/BlogPageTest.php:23

FAILURES!

Tests: 1, Assertions: 4, Failures: 1.

- ▶ **There are no filters on the view**
- ▶ **Add the filters**
- ▶ **Export and save the view**

PHPUnit 6.5.8 by Sebastian Bergmann and contributors.

Testing web/modules/custom/tdd_blog/tests/src/Kernel

.

1 / 1 (100%)

Time: 2.02 seconds, Memory: 6.00MB

OK (1 test, 6 assertions)

TASKS

- ▶ ~~Ensure the blog page exists~~
- ▶ ~~Ensure only published articles are shown~~
- ▶ Ensure the articles are shown in the correct order

STEP 4

**ENSURE THE ARTICLES ARE
ORDERED BY DATE**


```
// modules/custom/tdd_blog/tests/src/Kernel/BlogPageTest.php

public function testArticlesAreOrderedByDate() {
    // Given that I have numerous articles with different post dates.

    // When I go to the blog page.

    // The articles are ordered by post date.
}
```

```
// modules/custom/tdd_blog/tests/src/Kernel/BlogPageTest.php
```

```
public function testArticlesAreOrderedByDate() {  
    // Given that I have numerous articles with different post dates.  
    $this->createNode(['type' => 'article', 'created' => (new \DateTime())->modify('+1 day')->getTimestamp()]);  
    $this->createNode(['type' => 'article', 'created' => (new \DateTime())->modify('+1 month')->getTimestamp()]);  
    $this->createNode(['type' => 'article', 'created' => (new \DateTime())->modify('+3 days')->getTimestamp()]);  
    $this->createNode(['type' => 'article', 'created' => (new \DateTime())->modify('+1 hour')->getTimestamp()]);  
  
    // When I go to the blog page.  
  
    // The articles are ordered by post date.  
}
```

```
$this->createNode([  
    'type' => 'article',  
    'created' => (new \DateTime())->modify('+1 day')->getTimestamp(),  
]);
```

```
// modules/custom/tdd_blog/tests/src/Kernel/BlogPageTest.php
```

```
public function testArticlesAreOrderedByDate() {  
    // Given that I have numerous articles with different post dates.  
    $this->createNode(['type' => 'article', 'created' => (new \DateTime())->modify('+1 day')->getTimestamp()]);  
    $this->createNode(['type' => 'article', 'created' => (new \DateTime())->modify('+1 month')->getTimestamp()]);  
    $this->createNode(['type' => 'article', 'created' => (new \DateTime())->modify('+3 days')->getTimestamp()]);  
    $this->createNode(['type' => 'article', 'created' => (new \DateTime())->modify('+1 hour')->getTimestamp()]);  
  
    // When I go to the blog page.  
    $results = views_get_view_result('blog');  
  
    // The articles are ordered by post date.  
}
```

```
// modules/custom/tdd_blog/tests/src/Kernel/BlogPageTest.php

public function testArticlesAreOrderedByDate() {
    // Given that I have numerous articles with different post dates.
    $this->createNode(['type' => 'article', 'created' => (new \DateTime())->modify('+1 day')->getTimestamp()]);
    $this->createNode(['type' => 'article', 'created' => (new \DateTime())->modify('+1 month')->getTimestamp()]);
    $this->createNode(['type' => 'article', 'created' => (new \DateTime())->modify('+3 days')->getTimestamp()]);
    $this->createNode(['type' => 'article', 'created' => (new \DateTime())->modify('+1 hour')->getTimestamp()]);

    // When I go to the blog page.
    $results = views_get_view_result('blog');

    $nids = array_map(function(ResultRow $result) {
        return $result->_entity->id();
    }, $results);

    // The articles are ordered by post date.
}
```

```
// modules/custom/tdd_blog/tests/src/Kernel/BlogPageTest.php

public function testArticlesAreOrderedByDate() {
    // Given that I have numerous articles with different post dates.
    $this->createNode(['type' => 'article', 'created' => (new \DateTime())->modify('+1 day')->getTimestamp()]);
    $this->createNode(['type' => 'article', 'created' => (new \DateTime())->modify('+1 month')->getTimestamp()]);
    $this->createNode(['type' => 'article', 'created' => (new \DateTime())->modify('+3 days')->getTimestamp()]);
    $this->createNode(['type' => 'article', 'created' => (new \DateTime())->modify('+1 hour')->getTimestamp()]);

    // When I go to the blog page.
    $results = views_get_view_result('blog');

    $nids = array_map(function(ResultRow $result) {
        return $result->_entity->id();
    }, $results);

    // The articles are ordered by post date.
    $this->assertEquals([4, 1, 3, 2], $nids);
}
```

PHPUnit 6.5.8 by Sebastian Bergmann and contributors.

Testing web/modules/custom/tdd_blog/tests/src/Kernel

F

1 / 1 (100%)

Time: 1.42 seconds, Memory: 6.00MB

There was 1 failure:

1) Drupal\Tests\tdd_blog\Kernel\BlogPageTest::testArticlesAreOrderedByDate

Failed asserting that two arrays are equal.

--- Expected

+++ Actual

@@ @@

```
Array (
-   0 => 4
-   1 => 1
-   2 => 3
-   3 => 2
+   0 => '3'
+   1 => '2'
+   2 => '4'
+   3 => '1'
```

/Users/opdavies/Code/drupal-testing-workshop/web/core/tests/Drupal/KernelTests/KernelTestBase.php:1114

/Users/opdavies/Code/drupal-testing-workshop/web/modules/custom/tdd_blog/tests/src/Kernel/BlogPageTest.php:43

FAILURES!

Tests: 1, Assertions: 4, Failures: 1.

PHPUnit 6.5.8 by Sebastian Bergmann and contributors.

Testing web/modules/custom/tdd_blog/tests/src/Kernel

F

1 / 1 (100%)

Time: 1.42 seconds, Memory: 6.00MB

There was 1 failure:

1) Drupal\Tests\tdd_blog\Kernel\BlogPageTest::testArticlesAreOrderedByDate

Failed asserting that two arrays are equal.

--- Expected

+++ Actual

@@ @@

```
Array (  
-   0 => 4  
-   1 => 1  
-   2 => 3  
-   3 => 2  
+   0 => '3'  
+   1 => '2'  
+   2 => '4'  
+   3 => '1'
```

/Users/opdavies/Code/drupal-testing-workshop/web/core/tests/Drupal/KernelTests/KernelTestBase.php:1114

/Users/opdavies/Code/drupal-testing-workshop/web/modules/custom/tdd_blog/tests/src/Kernel/BlogPageTest.php:43

FAILURES!

Tests: 1, Assertions: 4, Failures: 1.

- ▶ **There is no sort order defined on the view**
- ▶ **Add the sort order**
- ▶ **Re-export the view**

PHPUnit 6.5.8 by Sebastian Bergmann and contributors.

Testing web/modules/custom/tdd_blog/tests/src/Kernel

.

1 / 1 (100%)

Time: 1.74 seconds, Memory: 6.00MB

OK (1 test, 5 assertions)

TASKS

- ▶ ~~Ensure the blog page exists~~
- ▶ ~~Ensure only published articles are shown~~
- ▶ ~~Ensure the articles are shown in the correct order~~

QUESTIONS?

THANKS

@OPDAVIES

OLIVERDAVIES.UK