PHP UK CONFERENCE

15th & 16th February 2024

www.phpconference.co.uk

Dave Liddament

Elevating Legacy: A Case Study on the migration from Laravel 4 to 9

The Brewery, London, UK

@daveliddament

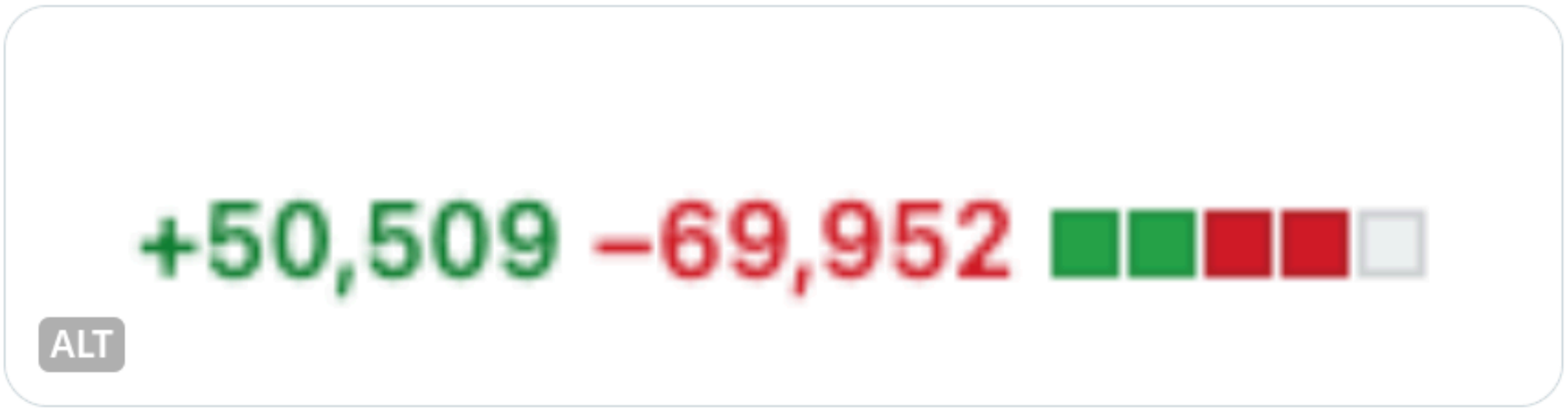
Dave Liddament
@DaveLiddament

Finally completed an upgrade from #laravel 4.2 to 9.

To celebrate Laravel have released version 10!

Remember your tests folks. This upgrade wouldn't have been possible, or as smooth, without tests.
Also @rectorphp is pretty handy for this.

I must write a blog/talk about it.



5:25 PM · Feb 24, 2023 · **3,813** Views

@daveliddament

Writing a Custom Rector Rule

Thoughts

Execute

Code Prehab

Plan

@daveliddament

Writing a Custom
Rector Rule

Thoughts

Execute

Code Prehab

Plan

@daveliddament

Photo by Antoine GIRET on Unsplash

@daveliddament

Add tombstones

```
final class PriceCalculator
{
 public function calculate(): void
 {
    TombstoneReporter::trigger(
      'PriceCalculator::calculate');

    // Rest of method's code
  }
}
```

Trigger tombstones

triggered_tombstones.json

```
[
    'PriceCalculator::calculate',
    'PriceController::index',
    'PriceRepository::getItems,
    ...
];
```

Photo by Christin Hume on Unsplash

@daveliddament

Remove triggered tombstones

```
final class PriceCalculator
{
 public function calculate(): void
 {
    TombstoneReporter::trigger(
      'PriceCalculator::calculate');

    // Rest of method's code
  }
}
```

Delete code

```
“REMOVE: Product listing page”

“REMOVE: 2 for 1 discount code”
```

Photo by Claudio Schwarz on Unsplash

@daveliddament

Increase type coverage

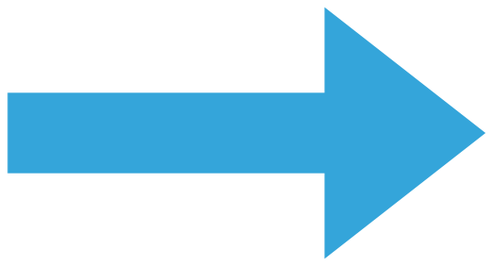
```
function getNames($users)
{

   $names = [];
   foreach($users as $user) {
      $names[] = $user->getUser();
   }

   return join(‘,’, $names);
}
```

0% type coverage

```php
/** @param array<int,User> $users */
function getNames(array $users): string
{

  $names = [];
  foreach($users as $user) {
    $names[] = $user->getUser();
  }
  return join(‘,’, $names);

}
```

100% type coverage

User

getUser  getUsername

0% type coverage

```
function getNames($users)
{

   $names = [];
   foreach($users as $user) {
      $names[] = $user->getUser();
   }

   return join(‘,’, $names);
}
```

100% type coverage

```
/** @param array<int,User> $users */
function getNames(array $users): string
{

   $names = [];
   foreach($users as $user) {
     $names[] = $user->getUser();
   }
   return join(‘,’, $names);

}
```

100% type coverage

```
/** @param array<int,User> $users */
function getNames(array $users): string
{

    $names = [];
    foreach($users as $user) {
      $names[] = $user->getUsername();
    }
    return join(‘,’, $names);

}
```

100% automated!

Tests

Photo by Pascal Meier on Unsplash

@daveliddament

Code Prehab

Remove dead code	Increase type coverage	Increase test coverage

Writing a Custom Rector Rule

Thoughts

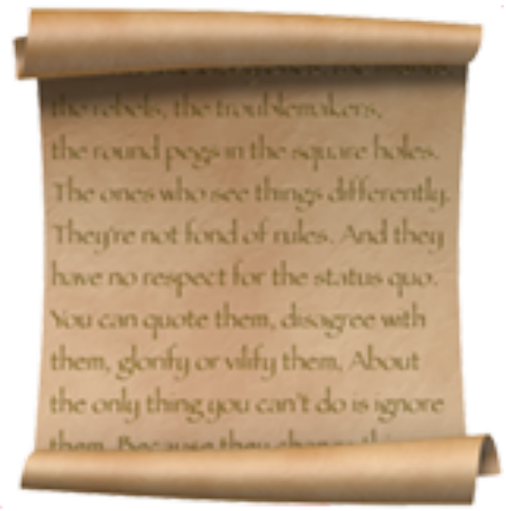
Execute

Code Prehab

Plan

@daveliddament

SHIFT



@daveliddament

https://laravelshift.com/

https://getrector.com/

359 Rules (and counting)

RenameMethodRector

Turns method names to new ones.

🔧 configure it!

- class: `Rector\Renaming\Rector\MethodCall\RenameMethodRector`

```
 $someObject = new SomeExampleClass;
-$someObject->oldMethod();
+$someObject->newMethod();
```

ChangeIfElseValueAssignToEarlyReturnRector

Change if/else value to early return

- class: `Rector\EarlyReturn\Rector\If_\ChangeIfElseValueAssignToEarlyReturnRector`

```
class SomeClass
{
    public function run()
    {
        if ($this->hasDocBlock($tokens, $index)) {
-            $docToken = $tokens[$this->getDocBlockIndex($tokens, $index)];
-        } else {
-            $docToken = null;
+            return $tokens[$this->getDocBlockIndex($tokens, $index)];
         }
-
-        return $docToken;
+        return null;
     }
 }
```

```
composer require --dev rector/rector
```

```
vendor/bin/rector
```

```
No "rector.php" config found. Should we
generate it for you? [yes]:
 > yes
```

```
 [OK] The config is added now. Re-run command
to make Rector do the work!
```

```php
<?php

use Rector\Config\RectorConfig;
use Rector\Renaming\Rector\MethodCall\RenameMethodRector;
use Rector\Renaming\ValueObject\MethodCallRename;

return RectorConfig::configure()

    ->withPaths([
        __DIR__ . '/src',
    ])

    ->withConfiguredRule(
        RenameMethodRector::class,
        [
            new MethodCallRename(
                App\Framework\Model::class,
                'belongsTo',
                'belongs')
        ]
    );
```

```
 7/7 [============================] 100%
2 files with changes
====================

1) src/Framework/Model.php:5

    ---------- begin diff ----------
@@ @@

 abstract class Model
 {
-    public function belongsTo(string $model): BelongsTo
+    public function belongs(string $model): BelongsTo
     {
         return new BelongsTo($model);
     }
    ---------- end diff ----------

Applied rules:
 * RenameMethodRector
```

```
2) src/Models/Car.php:10

    ---------- begin diff ----------
@@ @@
 {
     public function user(): BelongsTo
     {
-        return $this->belongsTo('User');
+        return $this->belongs('User');
     }

     public function manufacturer(): BelongsTo
     {
-        return $this->belongsTo(Manufacturer::class);
+        return $this->belongs(Manufacturer::class);
     }
 }
    ---------- end diff ----------

Applied rules:
 * RenameMethodRector
```

Rulesets: A set of rules

Rector: PHP Language upgrades

https://github.com/rectorphp/rector-symfony

https://github.com/driftingly/rector-laravel

```php
<?php

declare(strict_types=1);

use Rector\Config\RectorConfig;
use RectorLaravel\Set\LaravelSetList;

return RectorConfig::configure()

    ->withSets([
        LaravelSetList::LARAVEL_90
    ]);
```

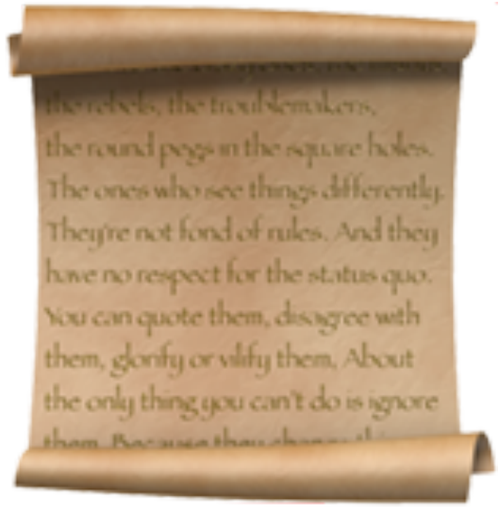
Renamed "Swift" Methods

Various SwiftMailer related methods, some of which were undocumented, have been renamed to their Symfony Mailer counterparts. For example, the `withSwiftMessage` method has been renamed to `withSymfonyMessage`:

https://laravel.com/docs/9.x/upgrade#symfony-mailer

```php
$rectorConfig>ruleWithConfiguration(
RenameMethodRector::class,
[
    new MethodCallRename(
        'Illuminate\Mail\Message',
        'withSwiftMessage',
        'withSymfonyMessage'),
]);
```

https://github.com/driftingly/rector-laravel/blob/main/config/sets/laravel90.php#L89


the rebels, the troublemakers,
the round pegs in the square holes.
The ones who see things differently.
They're not fond of rules. And they
have no respect for the status quo.
You can quote them, disagree with
them, glorify or vilify them. About
the only thing you can't do is ignore

Laravel

Search

Prologue

- Release Notes
- Upgrade Guide
- Contribution Guide

Upgrade Guide

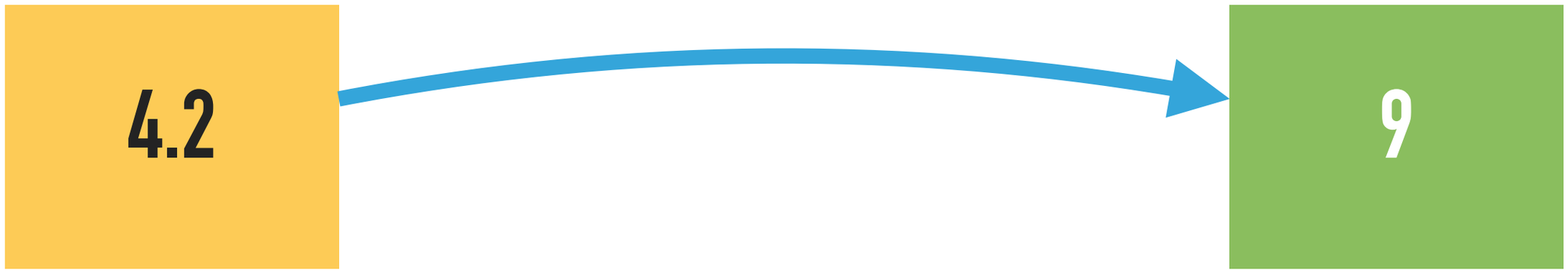
Upgrading to 10.0 from 9.x

Symfony

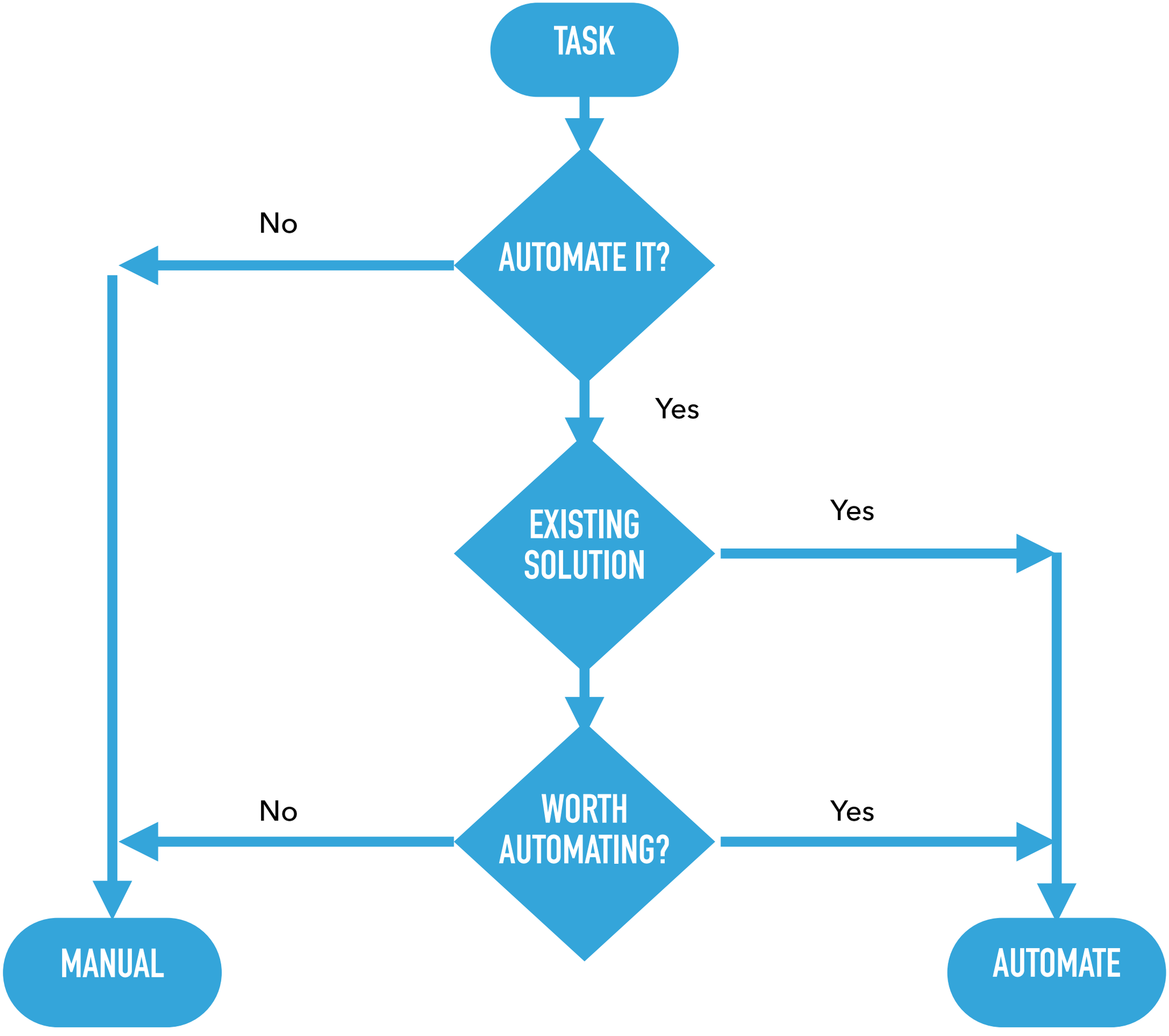
Upgrade to highest minor version → Fix all the deprecation warnings → Upgrade major version → Run flex recipes

https://symfony.com/doc/current/setup/upgrade_major.html

@daveliddament



- [x] Laravel validators
- [x] Symfony validators
- [x] E2E tests
- [x] Initial controller (probably login one)
- [x] Controllers and middleware
- [x] Remaining commands
- [x] Unit tests
- [x] Multiple environments (currently only test environment is setup)
  Includes ansible updates
- [x] Full testings
- [x] Merge in changes done since this branch started
- [x] PHP 8.1 upgrade


TASK
AUTOMATE IT?
No
Yes
EXISTING SOLUTION
Yes
WORTH AUTOMATING?
No
Yes
MANUAL
AUTOMATE

Development

UPGRADE

Development

@daveliddament

Smaller deploys would be better*

	Framework	PHP	PHPUnit
Current deployed versions	**12**	**8.1**	**8**
Current supported versions	**12**	**8.0, 8.1, 8.2**	**8, 9**
New supported versions	**13**	**8.2, 8.3**	**9, 10**

	Framework	PHP	PHPUnit
Current deployed versions	12	8.1	8
Current supported versions	12	8.0, 8.1, 8.2	8, 9
New supported versions	13	8.2, 8.3	9, 10

Development

UPGRADE

Development

Development

UPGRADE

Development

Dev

MOVING CODE

Dev

UPGRADE

Development

WRITE AUTOMATION SCRIPTS

@daveliddament

Code Prehab

Remove dead code

Increase Type coverage

Increase test coverage

Plan

SHIFT

- [x] Laravel validators
- [x] Symfony validators
- [x] E2E tests
- [x] Initial controller (probably login one)
- [x] Controllers and middleware
- [x] Remaining commands
- [x] Unit tests
- [x] Multiple environments (currently only test environment is setup)
  Includes ansible updates
- [x] Full testings
- [x] Merge in changes done since this branch started
- [x] PHP 8.1 upgrade

@daveliddament

Writing a Custom Rector Rule

Thoughts

Execute

Code Prehab

Plan

@daveliddament

Tips

- Be systematic; do one type of change at once. (Both manual and automation).
  - Note other changes you need to make. (e.g. TODO L9)
- Use git commits (even if you later squash them)
- Upgrades: fix the deprecations, you don’t need to (immediately) use the new features.
  - Less code in diff to search through when tracking down bugs.
- Do the minimum number of changes between possible release points

Writing a Custom Rector Rule

Old

```
class Car extends Model
{
  public function user()
  {
    return $this->belongsTo('User');
  }
}
```

New

```
class Car extends Model
{
  public function user()
  {
    return $this->belongsTo(App\Models\User::class);
  }
}
```

No Change

```
class Car extends Model
{
  public function user()
  {
    return $this->belongsTo(User::class);
  }
}
```

No Change

```
class CarService
{
  public function user()
  {
    return $this->belongsTo('User');
  }
}
```

```
$ vendor/bin/rector custom-rule
```

```
 What is the name of the rule class (e.g. "LegacyCallToDbalMethodCall")?:
 > FixModelMappingsRector

Generated files
===============

 * utils/rector/src/Rector/FixModelMappingsRector.php
 * utils/rector/tests/Rector/FixModelMappingsRector/Fixture/some_class.php.inc
 * utils/rector/tests/Rector/FixModelMappingsRector/config/configured_rule.php
 * utils/rector/tests/Rector/FixModelMappingsRector/FixModelMappingsRectorTest.php

 [OK] Base for the "FixModelMappingsRector" rule was created.
Now you can fill the missing parts

 [OK] We also update composer.json autoload-dev, to load Rector
rules. Now run "composer dump-autoload" to update paths
```

Old

```php
<?php
namespace Utils\Rector\Tests\Rector\FixModelMappingsRector\Fixture;

use App\Framework\BelongsTo;
use App\Framework\Model;

final class Car extends Model
{
    public function user(): BelongsTo
    {
        return $this->belongsTo('User');
    }
}
```

New

```php
<?php
namespace Utils\Rector\Tests\Rector\FixModelMappingsRector\Fixture;

use App\Framework\BelongsTo;
use App\Framework\Model;

final class Car extends Model
{
    public function user(): BelongsTo
    {
        return $this->belongsTo(App\Models\User::class);
    }
}
```

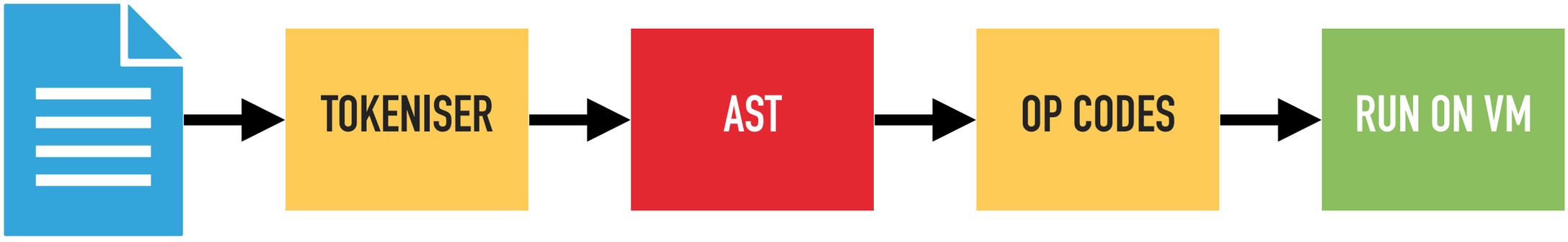
No change

```php
<?php
namespace Utils\Rector\Tests\Rector\FixModelMappingsRector\Fixture;

use App\Framework\BelongsTo;
use App\Framework\Model;

final class Car extends Model
{
    public function user(): BelongsTo
    {
        return $this->belongsTo(App\Models\User::class);
    }
}
```

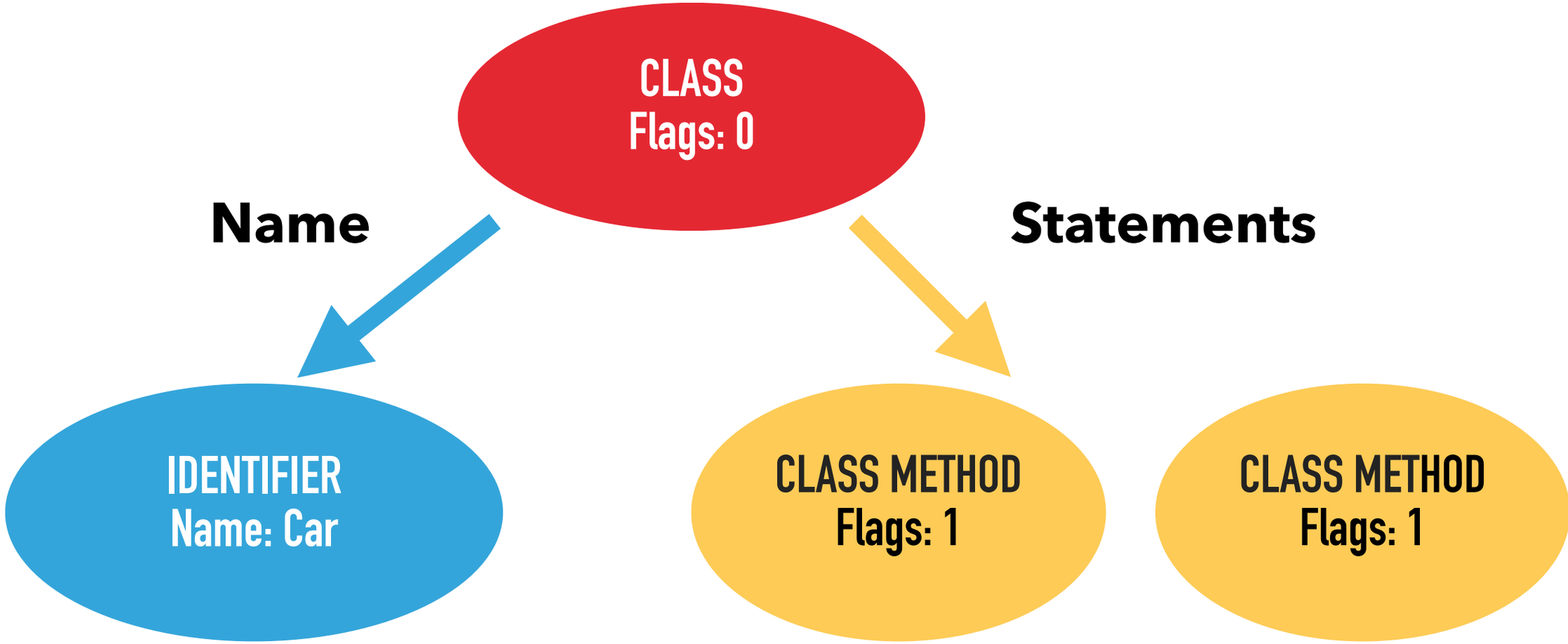
```
FixModelMappingsRector extends AbstractRector
{

    public function getRuleDefinition(): RuleDefinition

    public function getNodeTypes(): array

    public function refactor(Node $node): ?Node
}
```

```php
public function getRuleDefinition(): RuleDefinition
{
    return new RuleDefinition(
        "Fix Model mappings",
        [
            new CodeSample(
                '$this->belongsTo("User");',
                '$this->belongsTo(User::class);',
            ),
        ]
    );
}
```

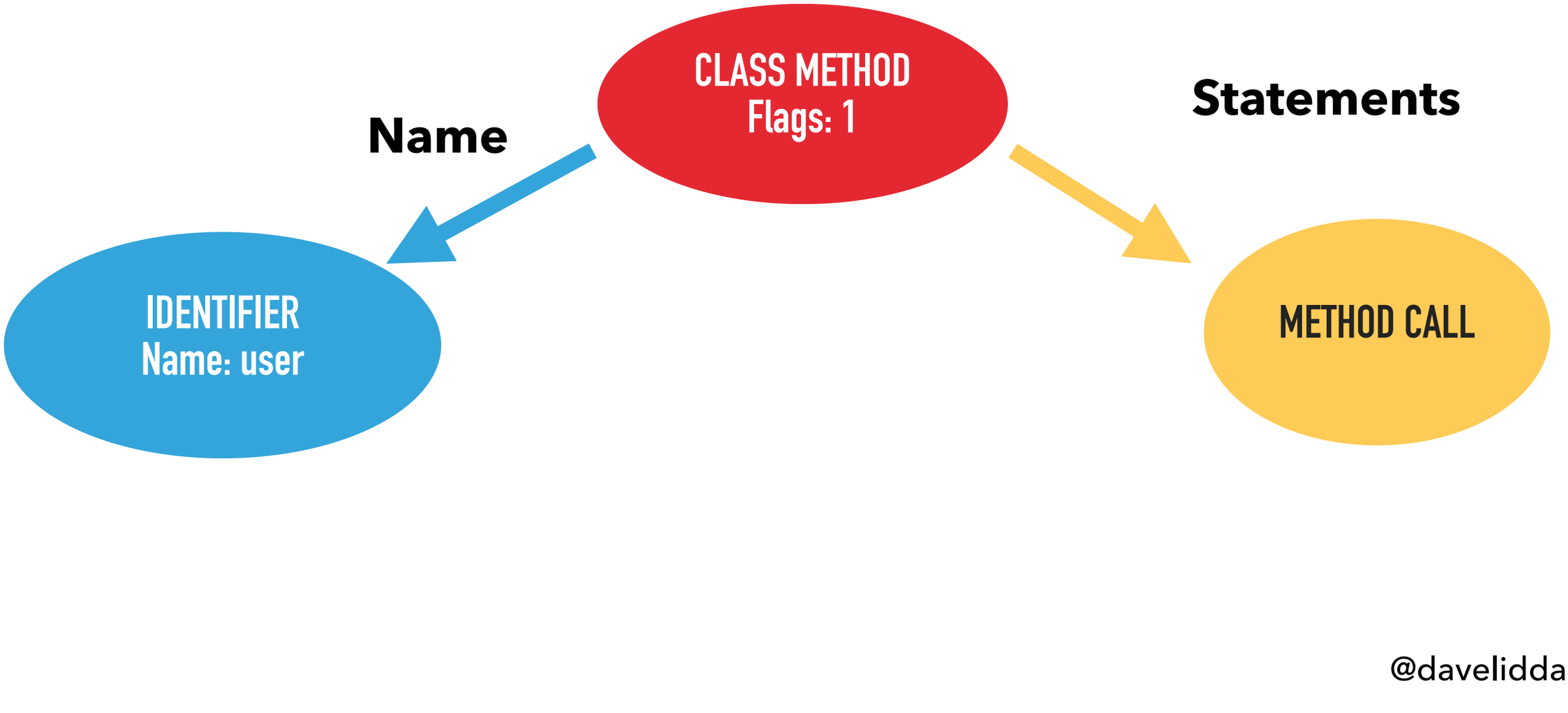
```
FixModelMappingsRector extends AbstractRector
{
    public function getRuleDefinition(): RuleDefinition

    public function getNodeTypes(): array

    public function refactor(Node $node): ?Node
}
```


TOKENISER
AST
OP CODES
RUN ON VM

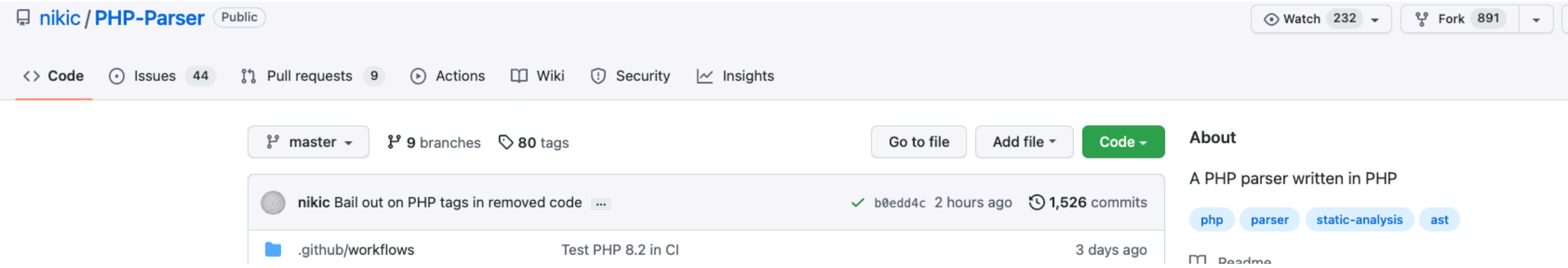
```
class Car
{
    public function users() {…}

    public function anotherMethod() {…}
}
```



```
public function user ()
{
    return $this->belongsTo('User');
}
```



https://github.com/nikic/PHP-Parser



- PHP code can be represented by an AST
- Different types of Node
- Nodes contain information
- Each type of node has different information

CLASS
Flags: 0

IDENTIFIER
Name: PersonNotifier

PROPERTY
Flags: 4

CLASS METHOD
Flags: 1

CLASS METHOD
Flags: 1

IDENTIFIER
Name: notifyPlayer

PARAM
ByRef: false
Variadic: false

METHOD CALL

IDENTIFIER
Name: string

VALUE
ByRef: false
Variadic: false

```
$this->belongsTo('User');

$this->belongsTo(App\Models\User::class);
```

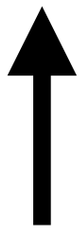
```
class MethodCall extends \PhpParser\Node\Expr\CallLike
{
    /** @var Expr Variable holding object */
    public $var;

    /** @var Identifier|Expr Method name */
    public $name;

    /** @var array<Arg|VariadicPlaceholder> Arguments */
    public $args;

    // Rest of class …
```

```
$this -> belongsTo ('User');
```

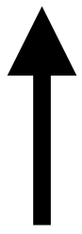
```
public function getNodes(): array
{
    return [MethodCall::class];
}
```

```
public function refactor(Node $node): ?Node
{

}
```

```
$this->belongsTo('User');
```



var



name

args

- var is an object that extends Model
- name is belongsTo
- 1st argument is a string

```
public function refactor(Node $node): ?Node
{
    // Is var an object that extends Model?

    $modelType = new ObjectType(Model::class);

    if (!$this->isObjectType($node->var, $modelType)) {
        return null;
    }
```

```
// Is name belongsTo

if (!$this->isName($node->name, 'belongsTo')) {
    return null;
}
```

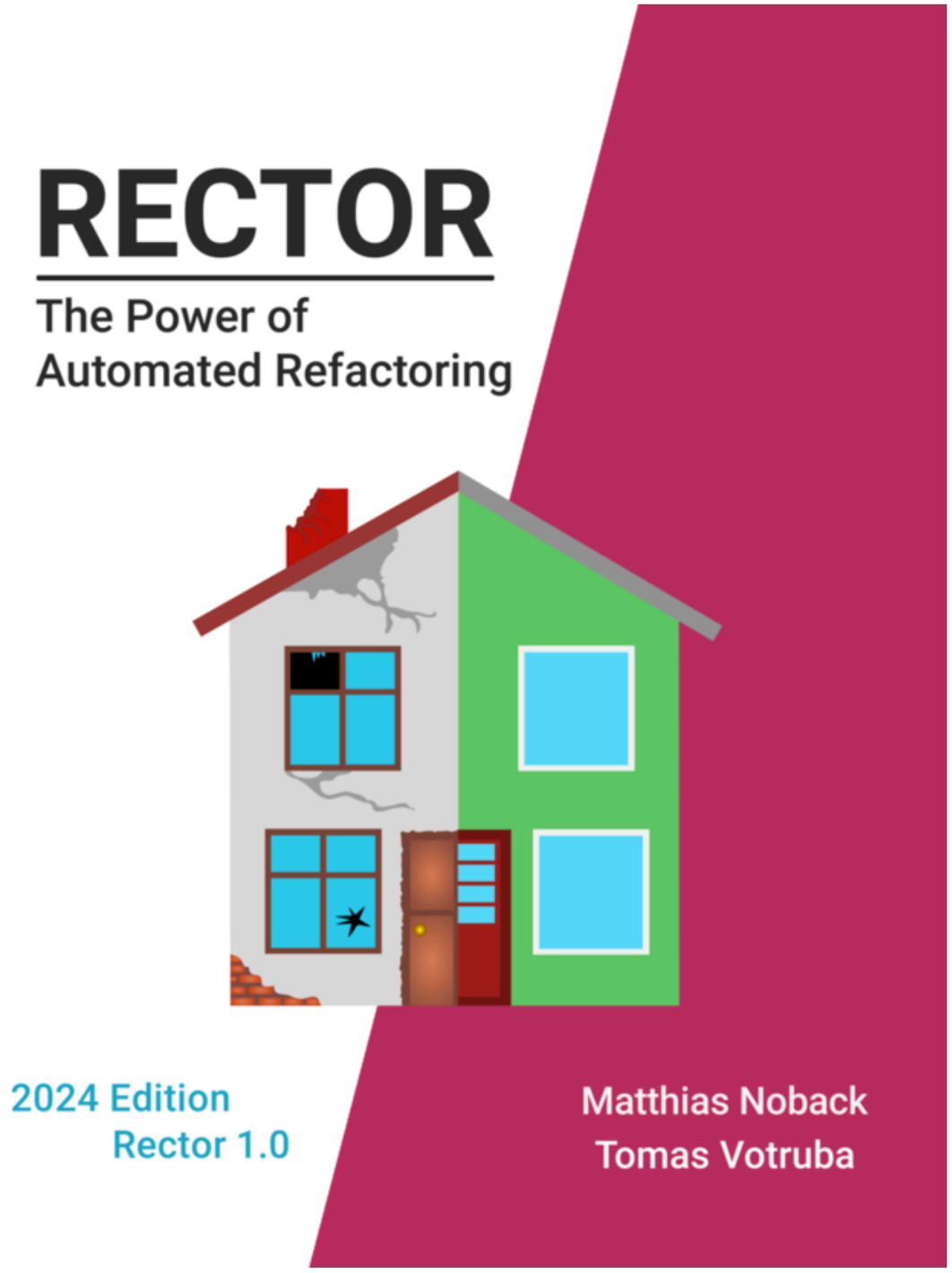
```
// Is 1st argument a string?

$arg = $node->args[0] ?? null;
if (! $arg instanceof Arg) {
    return null;
}

if (! $arg->value instanceof String_) {
    return null;
}
```

```
// Return updated node

$fqcn = 'App\\Models\\' . $arg->value->value;

$arg->value = new ClassConstFetch(
                        new Name($fqcn),
                        new Identifier("class"));

    return $node;
}
```

User::class is a ClassConstFetch Node in the AST

```php
public function refactor(Node $node): ?Node
{
    // Is var an object that extends Model?
    $modelType = new ObjectType(Model::class);
    if (!$this->isObjectType($node->var, $modelType)) {
        return null;
    }

    // Is name belongsTo
    if (!$this->isName($node->name, 'belongsTo')) {
        return null;
    }

    // Is 1st argument a string?
    $arg = $node->args[0] ?? null;
    if (! $arg instanceof Arg) {
        return null;
    }
    if (! $arg->value instanceof String_) {
        return null;
    }

    // Return updated node
    $fqcn = 'App\\Models\\' . $arg->value->value;
    $arg->value = new ClassConstFetch(new Name($fqcn),new Identifier("class"));

    return $node;
}
```

https://github.com/DaveLiddament/rector-rule-demo-update-belongs-to



@daveliddament

Code Prehab

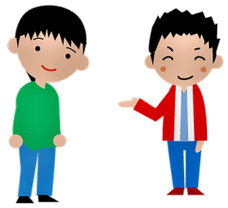
Remove dead code

Increase Type coverage

Increase test coverage

Plan

SHIFT



- [x] Laravel validators
- [x] Symfony validators
- [x] E2E tests
- [x] Initial controller (probably login one)
- [x] Controllers and middleware
- [x] Remaining commands
- [x] Unit tests
- [x] Multiple environments (currently only test environment is setup)
  Includes ansible updates
- [x] Full testings
- [x] Merge in changes done since this branch started
- [x] PHP 8.1 upgrade

Execute

Small focused steps

Minimum to upgrade

@daveliddament

Writing a Custom
Rector Rule

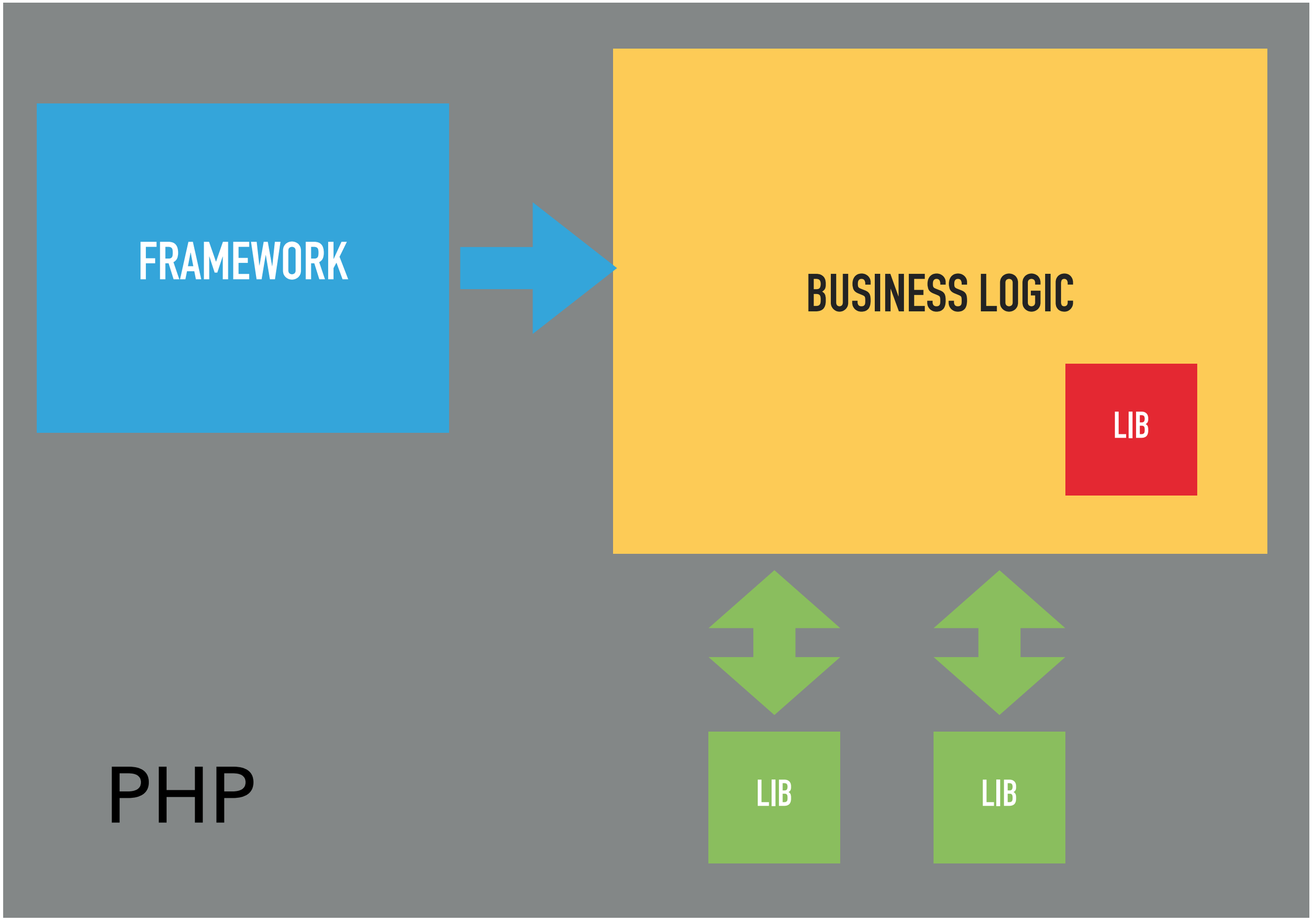
Thoughts

Execute

Code Prehab

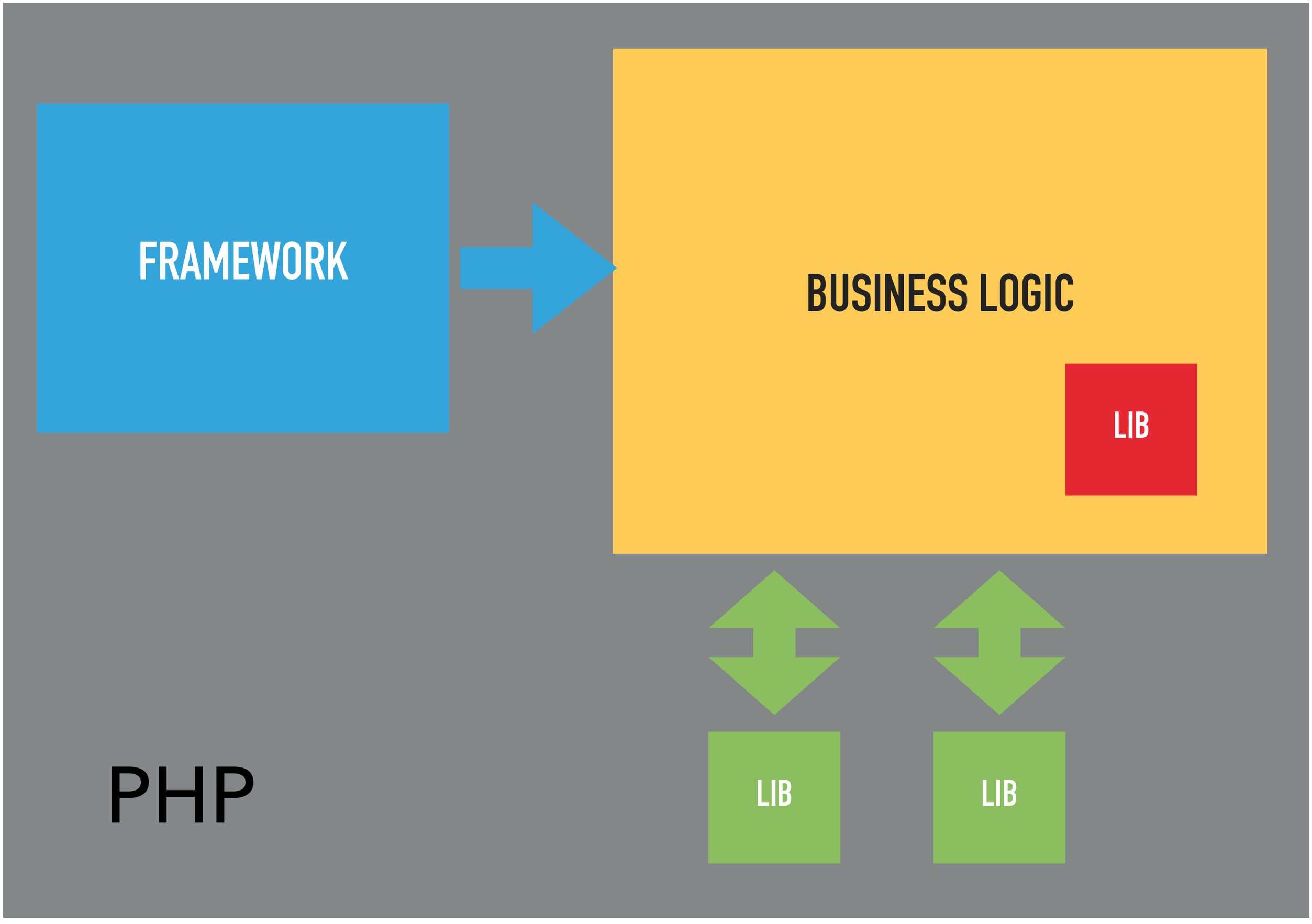
Plan

@daveliddament



@daveliddament

```
interface TextMessageGateway
{

    public function sendMessage(
        MobileNumber $from,
        MobileNumber $to,
        string $message,
    ):void ;

}
```



@daveliddament

What if....

composer.json

```
  “version-upgrade” : {
      “2” :  {
          “validate” : [
             “phpstan:my-framework/v1-2-checks”,
             “script:upgrades/v1-2-checks.sh”
          ],

          “upgrade” : [
             “script:upgrades/v1-2-update-1.sh”
             “rector:my-framework/v1-2-rector”,
             “script:upgrades/v1-2-update-2.sh”
          ]
   }
}
```

```
composer update
  framework/framework:^2
  --allow-upgrade-scripts
```

Dave Liddament

@daveliddament