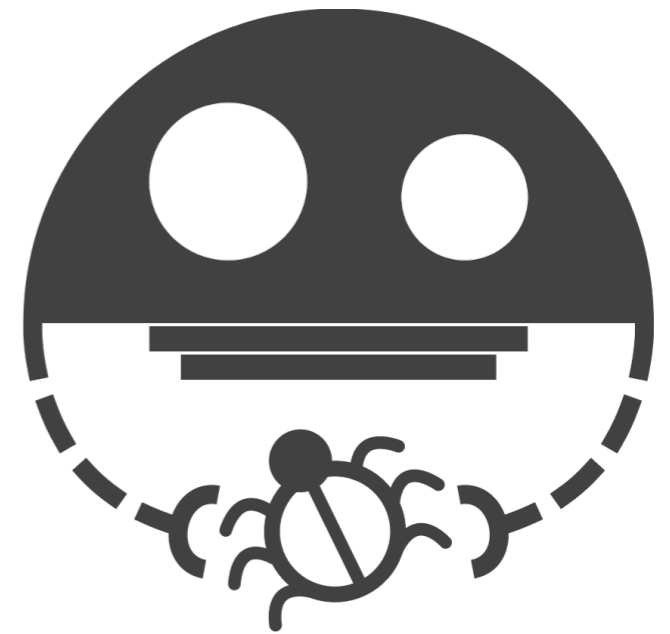


When QualityAssistant Meets Pharo



Enforced Code Critiques Motivate
More Valuable Rules



 [@yuriy_tymchuk](https://twitter.com/yuriy_tymchuk), *Mohammad Ghafari, Oscar Nierstrasz*

Software Composition Group @ University of Bern

The Concept

The Concept

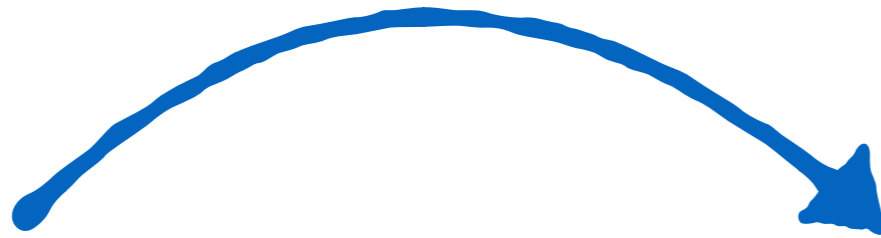


Rule

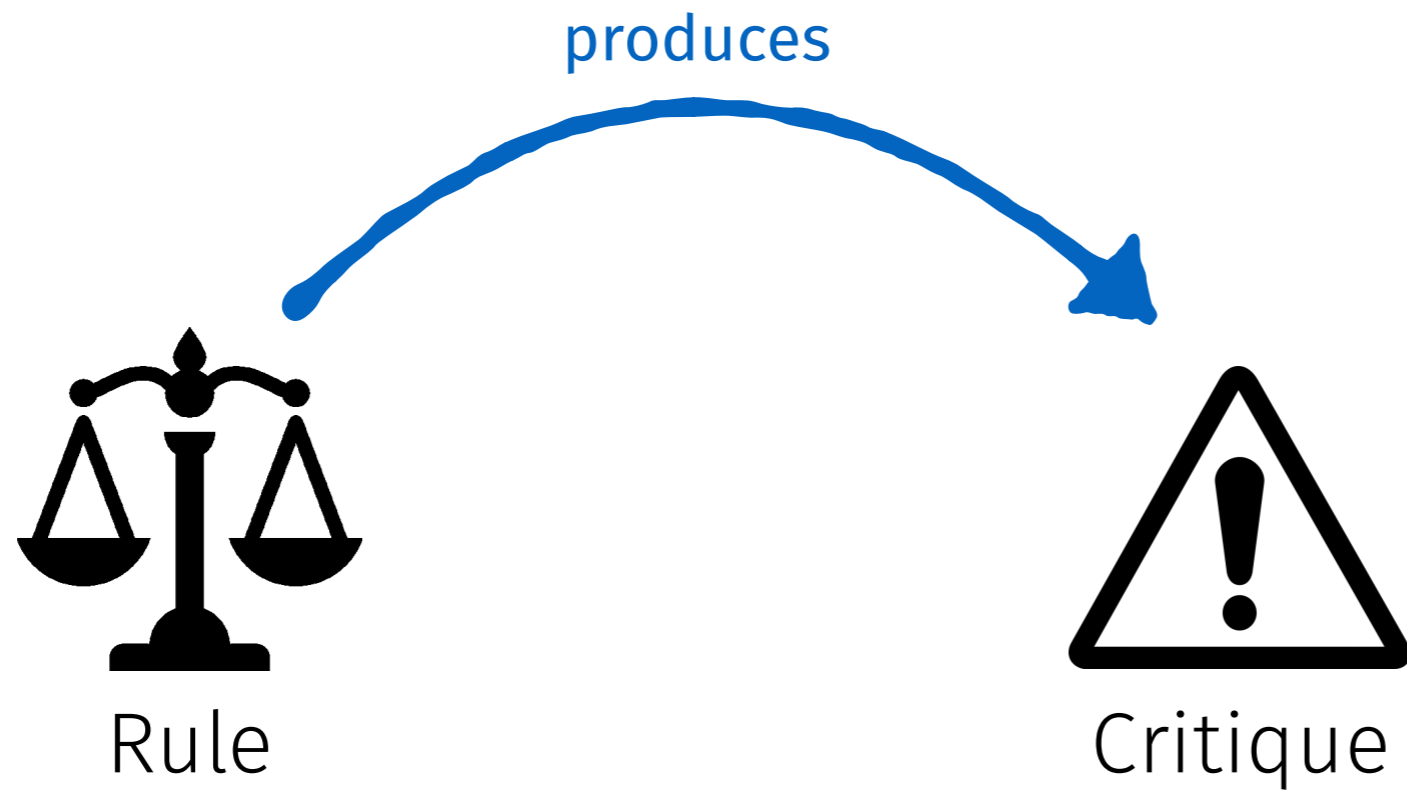
The Concept



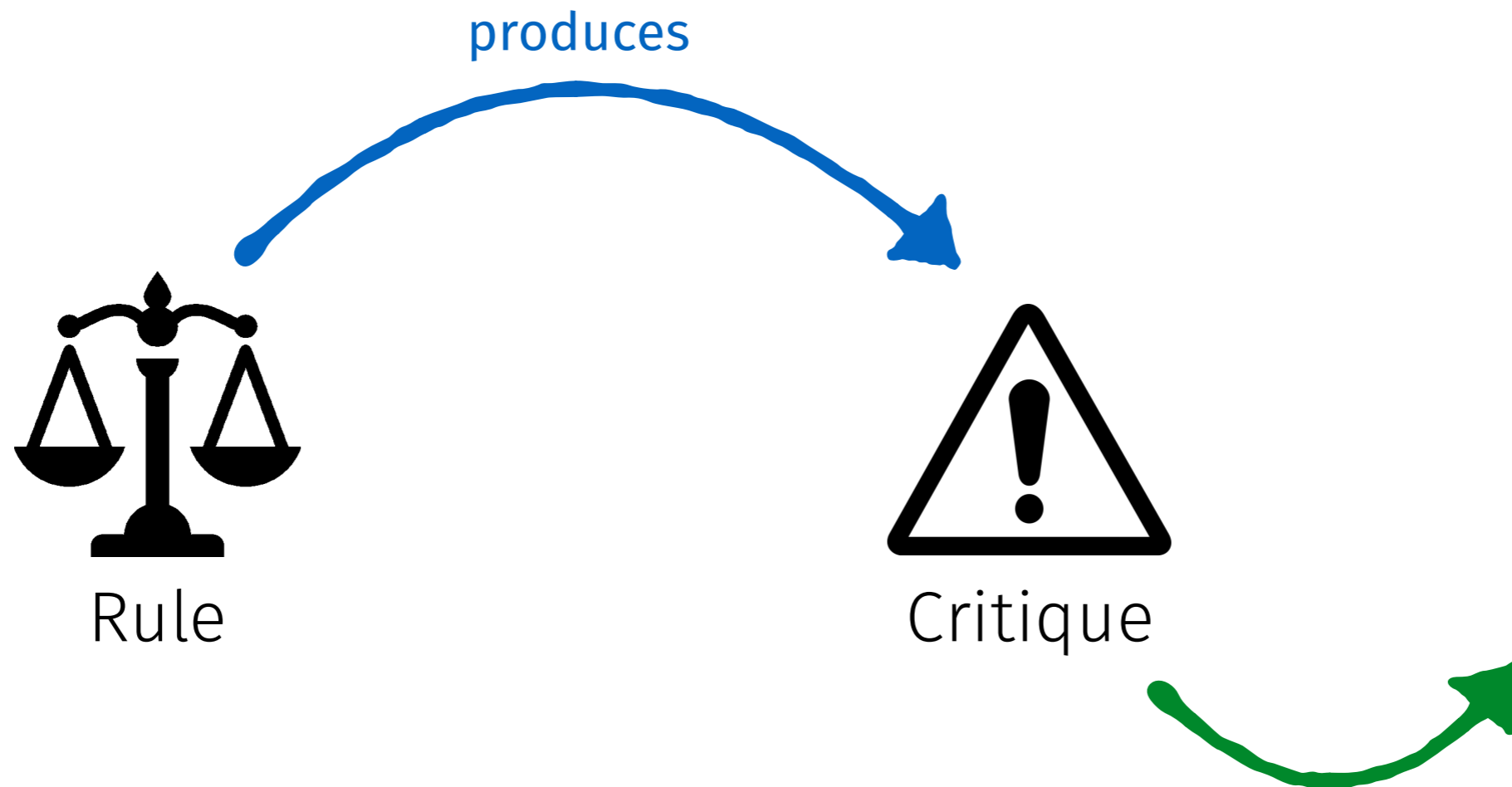
Rule



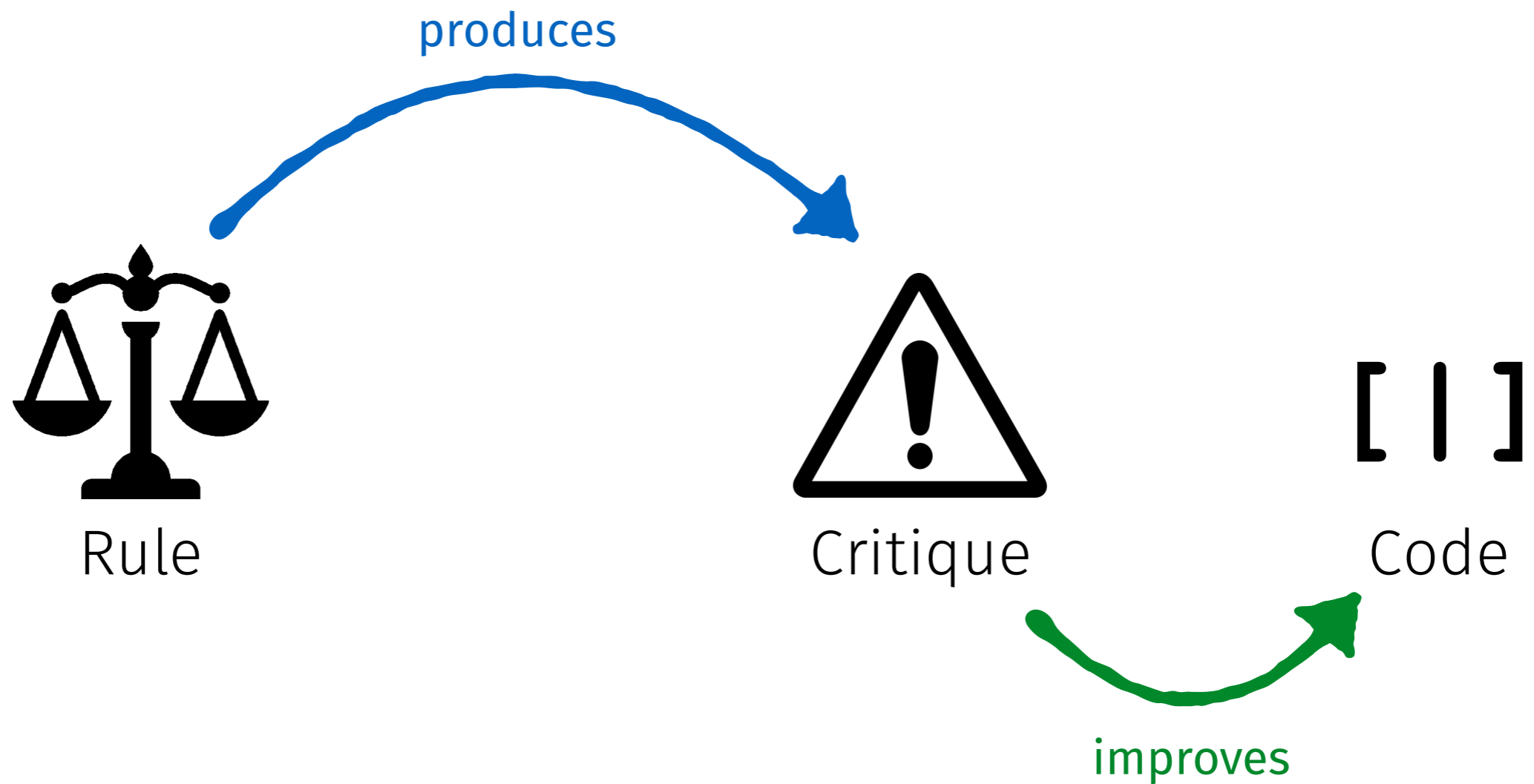
The Concept



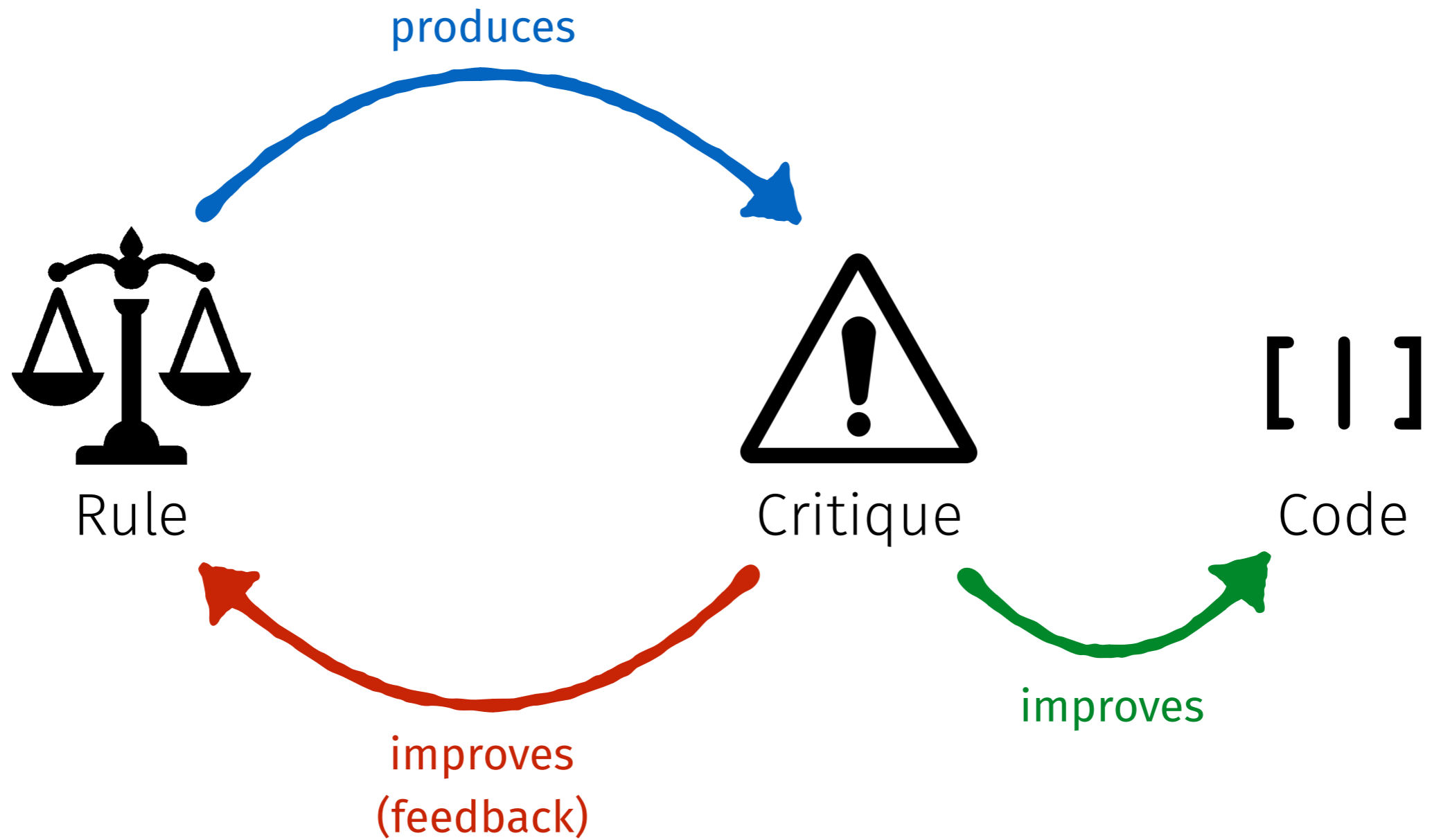
The Concept



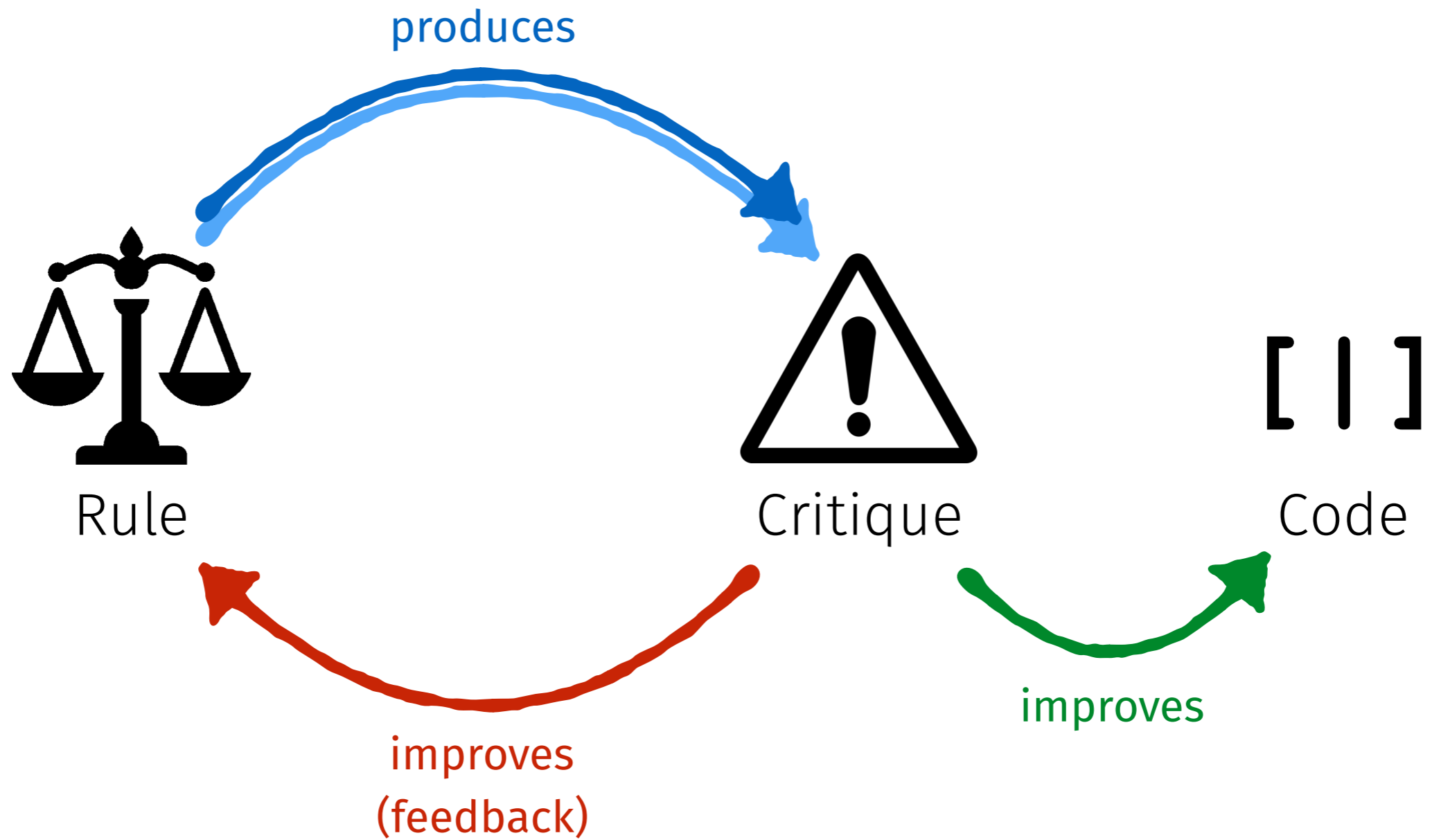
The Concept



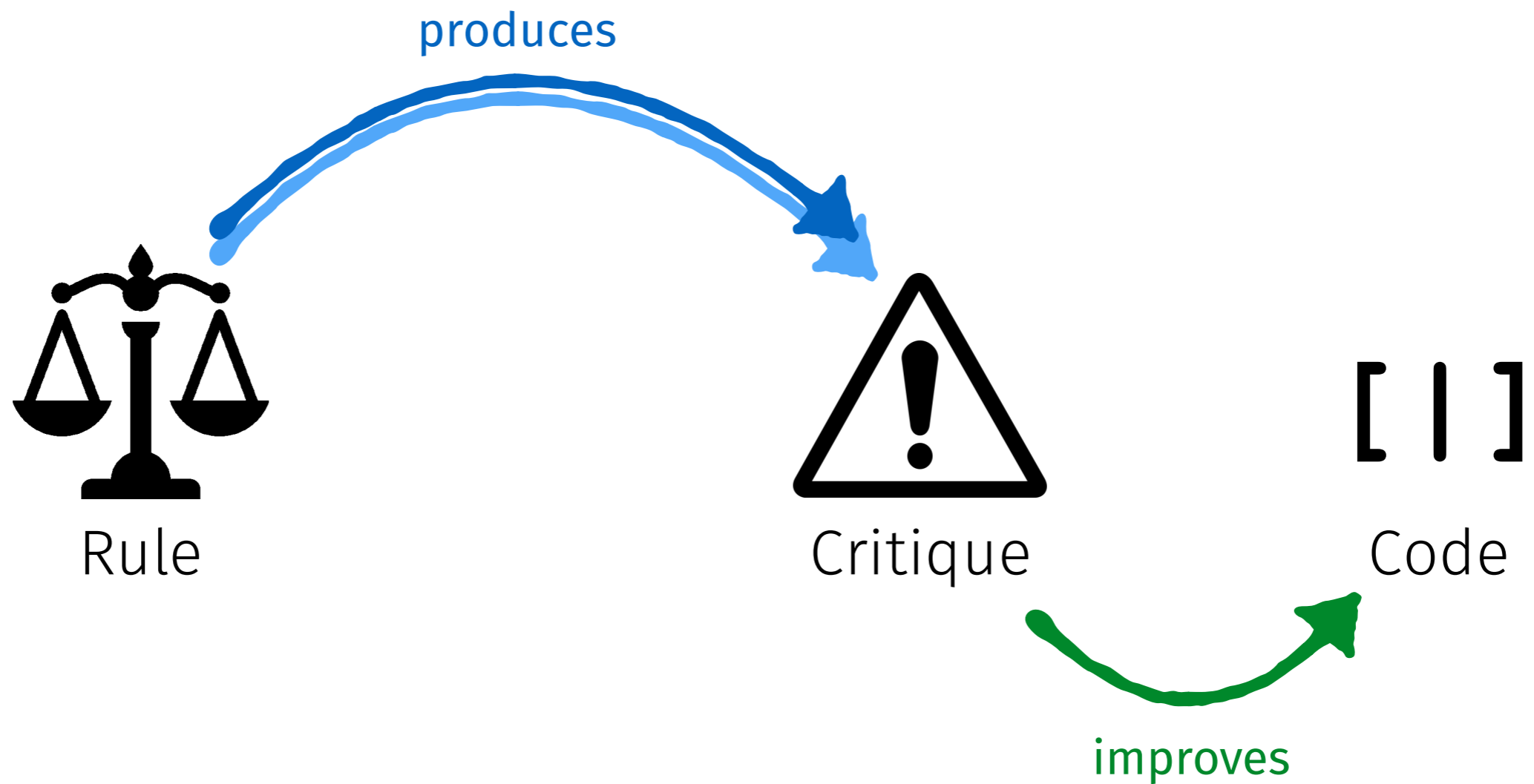
The Concept



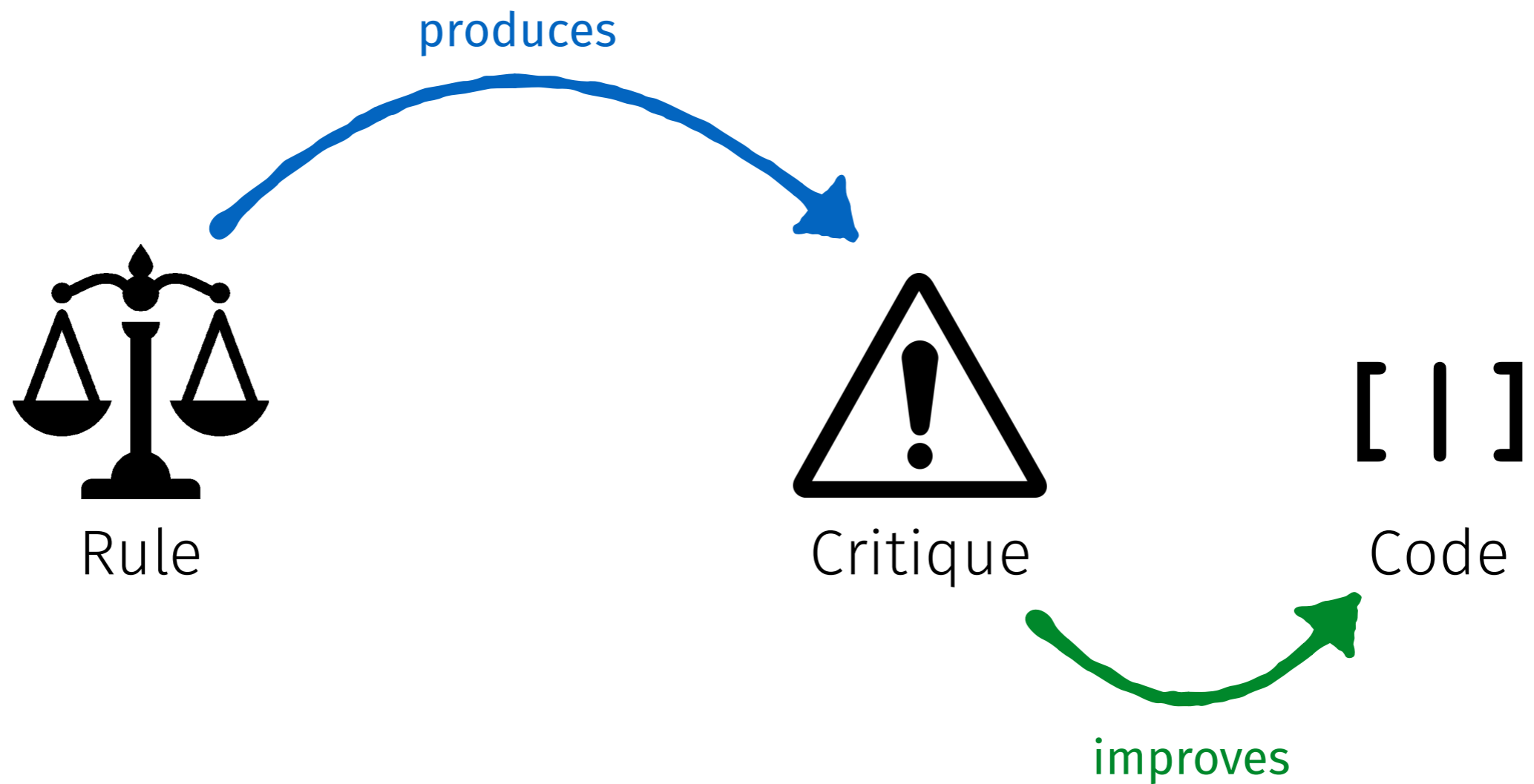
The Concept



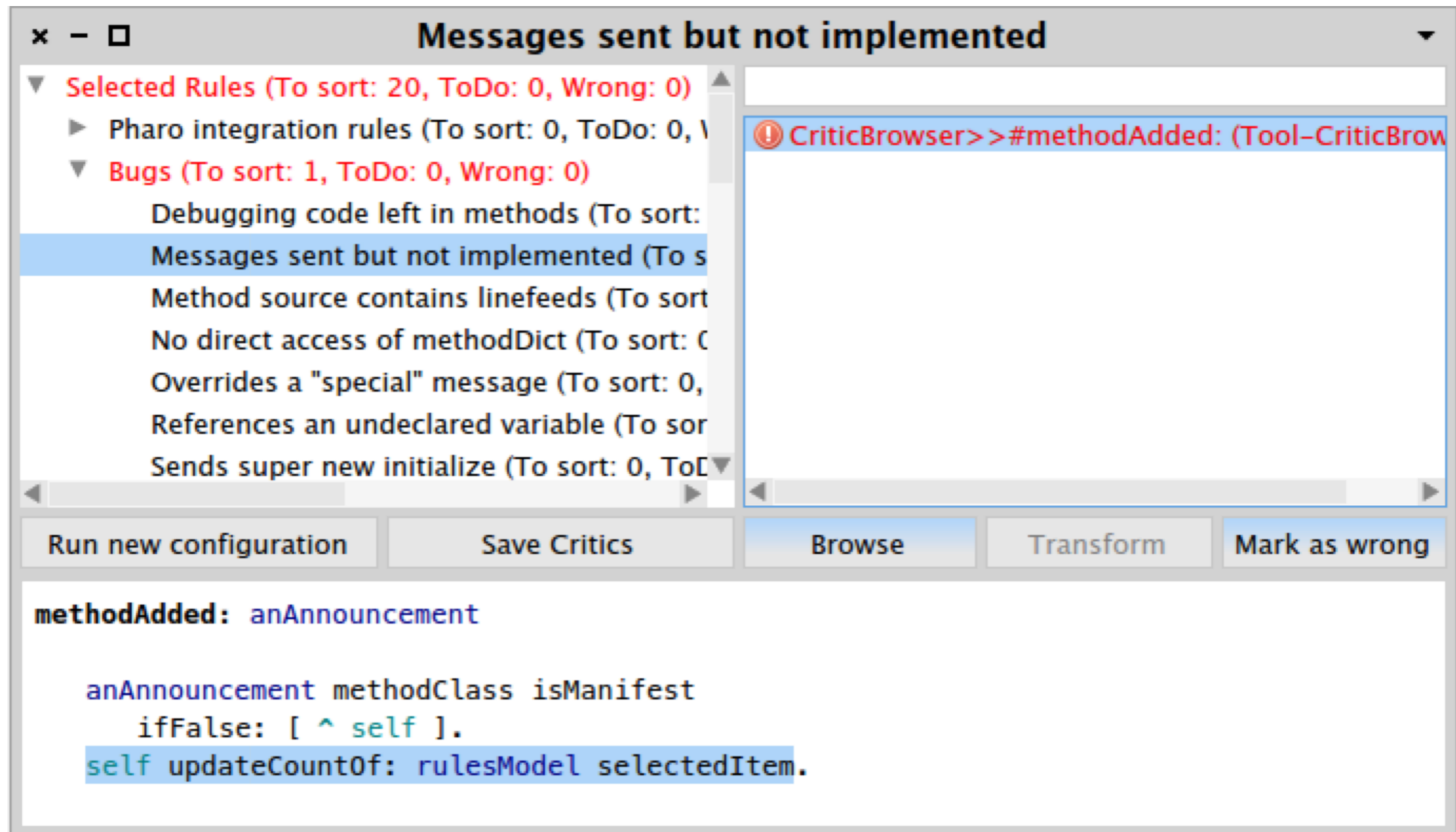
The Concept



The Concept



The Existing CriticBrowser



The screenshot shows the CriticBrowser application window titled "Messages sent but not implemented". The window is divided into several sections:

- Left Panel (Tree View):** Contains a list of rules categorized under "Selected Rules (To sort: 20, ToDo: 0, Wrong: 0)" and "Bugs (To sort: 1, ToDo: 0, Wrong: 0)". The rule "Messages sent but not implemented (To s" is selected and highlighted in blue.
- Right Panel (Code View):** Displays the source code for the selected rule. The first line is highlighted in blue: `CriticBrowser>>#methodAdded: (Tool-CriticBrow`. A red warning icon is visible at the start of this line.
- Bottom Panel (Buttons):** Contains five buttons: "Run new configuration", "Save Critics", "Browse", "Transform", and "Mark as wrong".
- Bottom Panel (Code View):** Displays the source code for the selected rule, with the last line highlighted in blue: `self updateCountOf: rulesModel selectedItem.`

```
methodAdded: anAnnouncement

anAnnouncement methodClass isManifest
  ifFalse: [ ^ self ].
self updateCountOf: rulesModel selectedItem.
```

Newly Introduced QualityAssistant

```
isForMethodHolder whenChangedDo: [ :bool |
  self changed: #isForMethod: with: { bool } ]

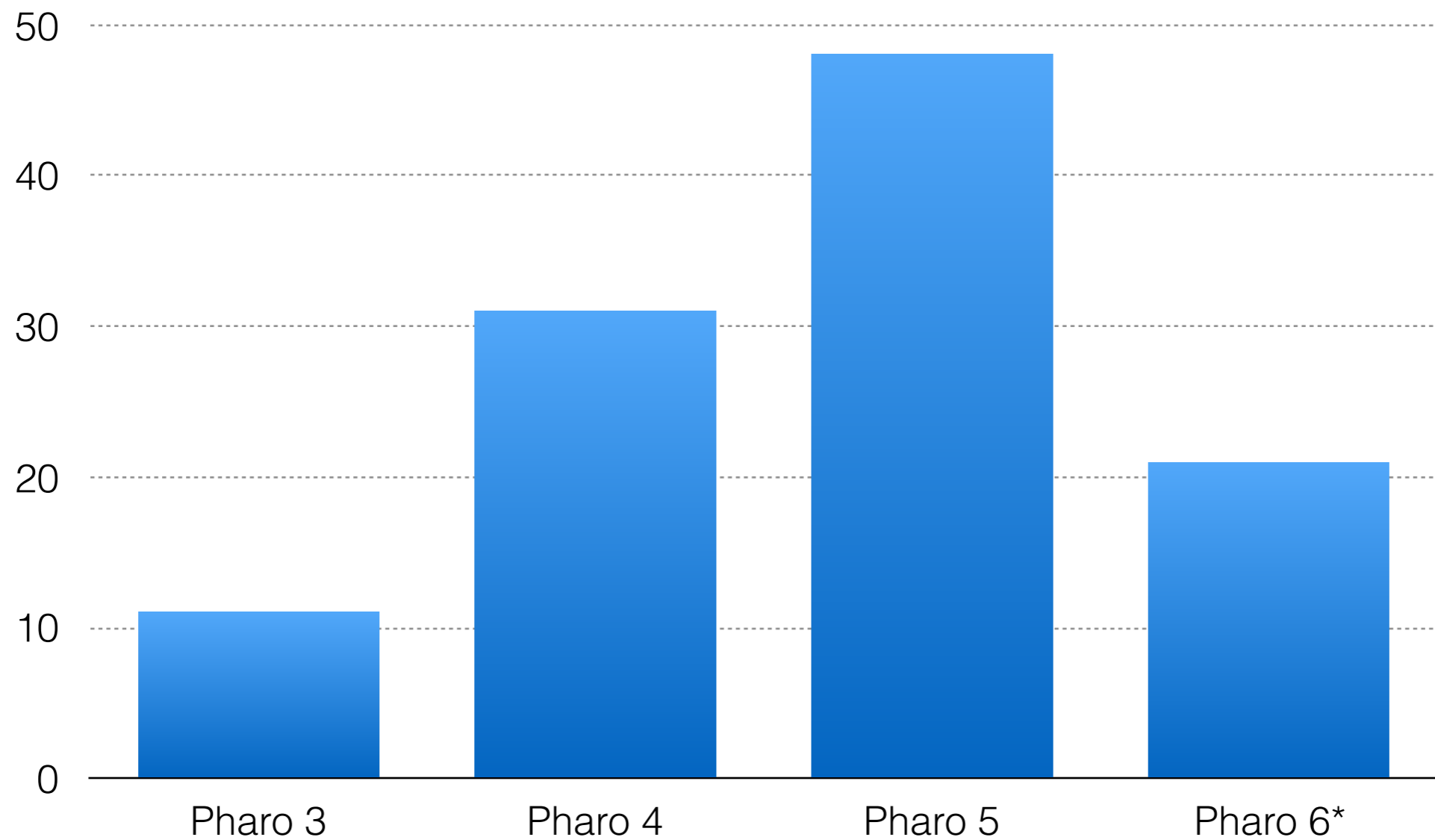
self
  beForCode;
  aboutToStyle: true.
```

13/15 [2] -- 13/15 [6] Format as you read W +L

⚠️ Uncommon message send ? ✖ Helpful? 👍 👎

❗ [self] Messages sent but not implemented ? ✖ Helpful? 👍 👎

SmallLint Issues per Milestone



Changes in Rules

Changes in Rules

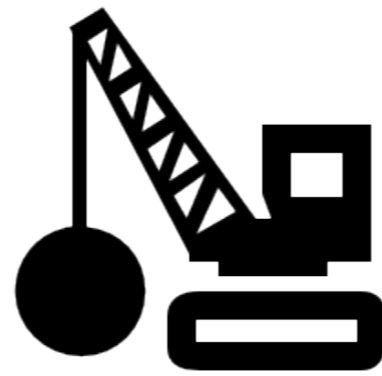


Fixed

Changes in Rules



Fixed

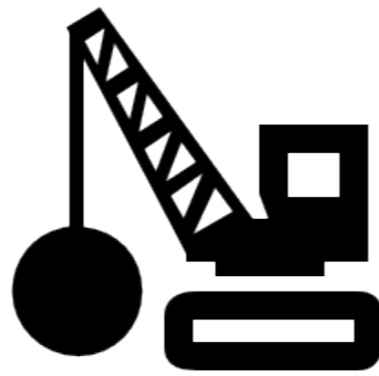


Removed

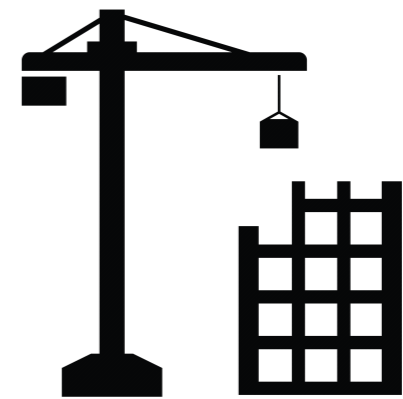
Changes in Rules



Fixed



Removed



Added





(Collection>>#add:) protocol → #adding



(Collection>>#add:) protocol → #adding

(ArrayedCollection>>#add:) protocol → #adding



`(Collection>>#add:)` protocol \longrightarrow `#accessing`

`(ArrayedCollection>>#add:)` protocol \longrightarrow `#adding`

 Fixed



`(Collection>>#add:)` protocol \longrightarrow `#accessing`

`(ArrayedCollection>>#add:)` protocol \longrightarrow `#adding`

 Fixed



```
(Collection>>#add:) protocol →  
# 'as yet unclassified'
```

```
(ArrayedCollection>>#add:) protocol → #adding
```




Fixed Trivial Bug



```
(Collection>>#add:) protocol →  
# 'as yet unclassified'
```

```
(ArrayedCollection>>#add:) protocol → #adding
```





RBModifiesCollectionRule

★ ← → Edit + Reopen

16105 **DNU: receiver of "compilationContext" is nil - AST - Code critics changes the AST**

Debugging: 1. Pharo Image | Milestone: Pharo5.0

Closed (Fixed)

Image Version
Pharo5.0

Priority
● 1 - Show Stopper !!!!!

Opened by Vincent Blondeau 06.08.2015 17:34

To reproduce on 50210:
To reproduce on 50210:

Opened by Vincent Blondeau 06.08.2015 17:34

Pharo5.0
Image Version



Fixed Horrible Bug

RBModifiesCollectionRule

★ ← → Edit + Reopen

16105 DNU: receiver of "compilationContext" is nil - AST - Code critics changes the AST

Debugging: 1. Pharo Image | Milestone: Pharo5.0

Closed (Fixed)

Image Version
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Opened by Vincent Blondeau 06.08.2015 17:34

To reproduce on 50210:
To reproduce on 50210:

Opened by Vincent Blondeau 06.08.2015 17:34

Pharo5.0
image version



Removed

 Removed

Probably missing ‘; yourself’

Non-blocks in special messages

References an abstract class

 Removed

Probably missing ‘; yourself’

Non-blocks in special messages

`size = 1 ifTrue: ':' ifFalse: 's:'`

References an abstract class

 Removed

Probably missing ‘; yourself’

Non-blocks in special messages

`size = 1` ifTrue: ‘:’ ifFalse: ‘s:’

References an abstract class

`String` new

Removed Educational

Probably missing ‘; yourself’

Non-blocks in special messages

`size = 1` ifTrue: ‘:’ ifFalse: ‘s:’

References an abstract class

`String` new

 Added

 Added

`ifNotNilDo:` → `ifNotNil:`

`Smalltalk at:` → `Smalltalk globals at:`

`assert: a = b` → `assert: a equals: b`

Added Migration

`ifNotNilDo:` → `ifNotNil:`

`Smalltalk at:` → `Smalltalk globals at:`

`assert: a = b` → `assert: a equals: b`

Added Migration

Recipe: use rewrite rules

`ifNotNilDo:` \longrightarrow `ifNotNil:`

`Smalltalk at:` \longrightarrow `Smalltalk globals at:`

`assert: a = b` \longrightarrow `assert: a equals: b`

 Added



reference to **BoxedFloat64**

 Added Private Access

reference to **BoxedFloat64**

Added Private Access

*Recipe: annotate/maintain a collection
of system classes/methods*

*reference to **BoxedFloat64***

 Added



```
b := RTMondrian new.  
b edges connectFrom: #superclass.  
b nodes: RTShape withAllSubclasses.
```



```
b := RTMondrian new.
```

```
b edges connectFrom: #superclass.
```

```
b nodes: RTShape withAllSubclasses.
```

 Added Invocation order

b := RTMondrian new.

b edges connectFrom: #superclass.

b nodes: RTShape withAllSubclasses.

Added Invocation Order

Recipe:

initialize

```
super initialize.
```

```
self add: #edges requiresPreSend: #nodes:.
```

```
b := RTMondrian new.
```

```
b edges connectFrom: #superclass.
```

```
b nodes: RTShape withAllSubclasses.
```

 Added

 Added

ReAbstractRule class

```
>> #checksPackage;
```

```
>> #checksClass;
```

```
>> #checksMethod;
```

```
>> #checksNode
```


 Added

ReAbstractRule class

```
>> #checksPackage;  
>> #checksClass;  
>> #checksMethod;  
>> #checksNode
```

} true?

Added Class Structure

ReAbstractRule class

>> #checksPackage;

>> #checksClass;

>> #checksMethod;

>> #checksNode

} true?

Added Class Structure

Recipe:

```
(aClass inheritsFrom: ReAbstractRule) and: [
selectors anySatisfy: [ :s | aClass perform: s ] ]
```

ReAbstractRule class

```
>> #checksPackage;
```

```
>> #checksClass;
```

```
>> #checksMethod;
```

```
>> #checksNode
```

} **true?**

 Added



```
gtInspectorMethodsIn: composite
  <gtInspectorPresentationOrder: 20>
  | methods |
  methods := (self methods collect: #asRingDefinition)
    sorted: [ :x :y | x selector < y selector ]
  composite list
    title: 'Methods';
    display: methods;
    format: #selector;
    tags: [ :each | {each methodClass name} ]
```



```
gtInspectorMethodsIn: composite
  <gtInspectorPresentationOrder: 20>
  | methods |
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gtInspectorMethodsIn: composite
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    tags: [ :each | {each methodClass name} ]
```


Added Lazy evaluation

```
gtInspectorMethodsIn: composite
  <gtInspectorPresentationOrder: 20>
  composite list
    title: 'Methods';
    display: [ (self methods collect: #asRingDefinition)
      sorted: [ :x :y | x selector < y selector ] ];
    format: #selector;
    tags: [ :each | {each methodClass name} ]
```

Added Lazy evaluation

Recipe:

presentation: `aPresentation isTheLeftmostReceipientIn: aStatement`

```
^ (aStatement isMessage or:  
  [ aStatement isCascade ]) and: [  
    aStatement leftmostChainReceiver = aPresentation ]
```

gtInspectorMethodsIn: `composite`

`<gtInspectorPresentationOrder: 20>`

`composite list`

`title: 'Methods';`

`display: [(self methods collect: #asRingDefinition)`

`sorted: [:x :y | x selector < y selector]];`

`format: #selector;`

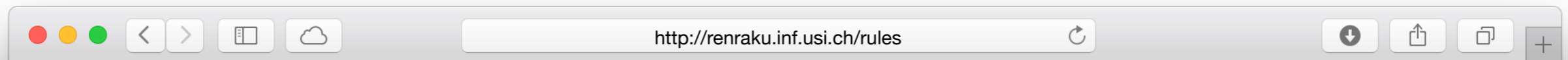
`tags: [:each | {each methodClass name}]`

Feedback

Feedback

<http://renraku.inf.usi.ch/rules>

Feedback



Feedback About SmallLint Rules

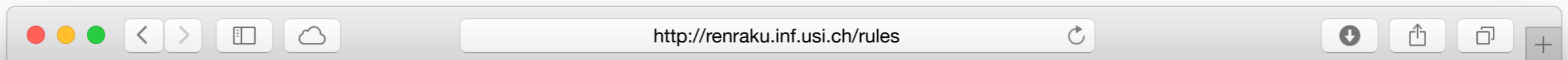
Positive

Rule name	# of feedbacks
RBSentNotImplementedRule	20
RBUnterreferencedVariablesRule	19
RBNoClassCommentRule	18
RBUnclassifiedMethodsRule	15
RBOnlyReadOrWrittenVariableRule	13
RBClassNotReferencedRule	11
AssertEqualSignIntoAssertEquals	6
RBOnlyReadOrWrittenTemporaryRule	6
RBRefersToClassRule	5
RBSelfSentNotImplementedRule	5
RBInconsistentMethodClassificationRule	5
RBConsistencyCheckRule	4
RBSendsUnknownMessageToGlobalRule	4
RBUnaryAccessingMethodWithoutReturnRule	4
RBExcessiveMethodsRule	3
RBEquivalentSuperclassMethodsRule	3

Negative

Rule name	# of feedbacks
RBClassNotReferencedRule	13
RBNoClassCommentRule	13
RBSentNotImplementedRule	10
RBMissingYourselfRule	10
RBUnclassifiedMethodsRule	9
RBAbstractClassRule	9
RBIfTrueReturnsRule	9
RBTempsReadBeforeWrittenRule	8
RBBadMessageRule	6
RBExcessiveVariablesRule	6
RBCollectionProtocolRule	5
RBOnlyReadOrWrittenVariableRule	5
RBSendsUnknownMessageToGlobalRule	5
RBMethodSourceContainsLinefeedsRule	4
RBCodeCruftLeftInMethodsRule	4
RBExcessiveMethodsRule	3

Feedback



Feedback About SmallLint Rules

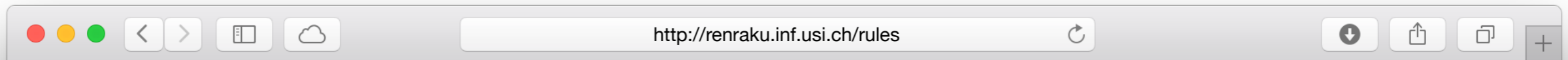
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Feedback



Feedback About SmallLint Rules

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Feedback

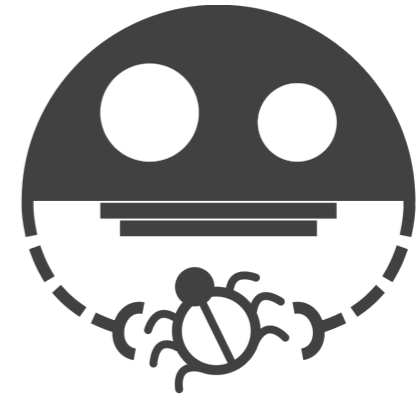
Feedback About SmallLint Rules

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When QualityAssistant Meets Pharo



Enforced Code Critiques Motivate
More Valuable Rules



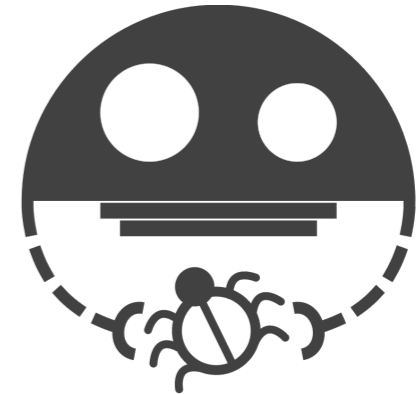
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Important
Fixes

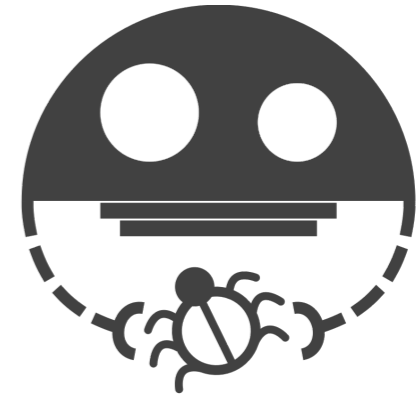
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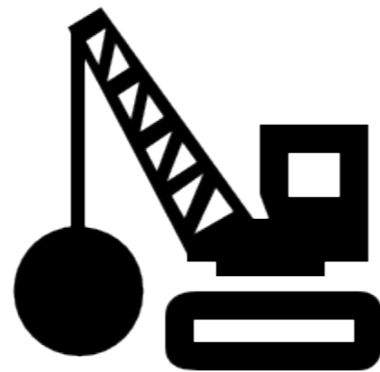
When QualityAssistant Meets Pharo



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Important
Fixes



Educational
Rules Removed

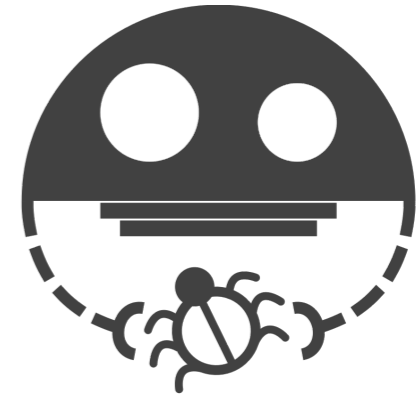
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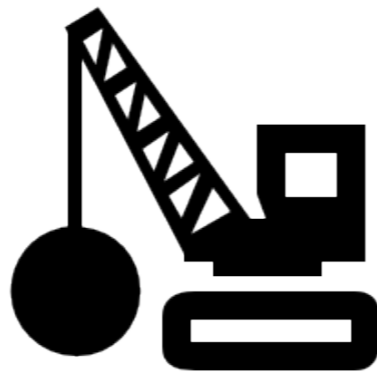
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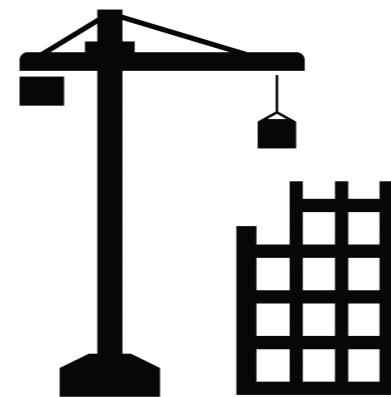
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Important
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Educational
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Domain Rules
Added

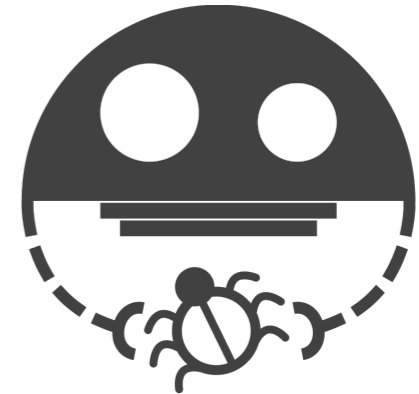
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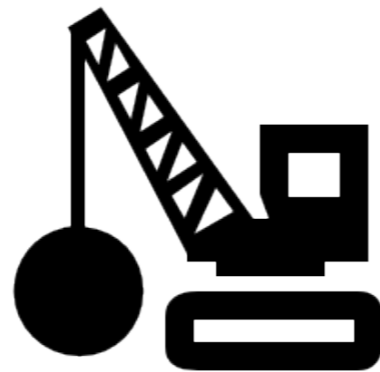
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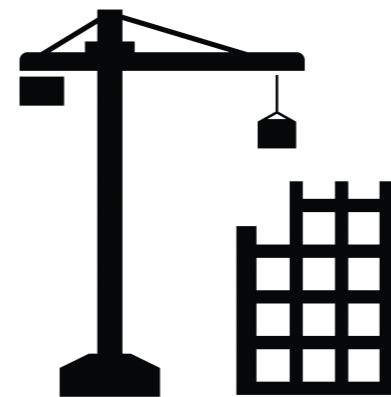
Enforced Code Critiques Motivate
More Valuable Rules



Important
Fixes



Educational
Rules Removed



Domain Rules
Added

Migration

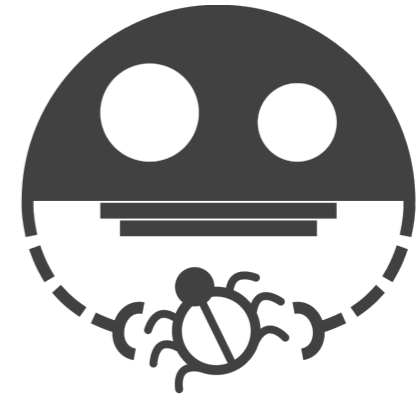
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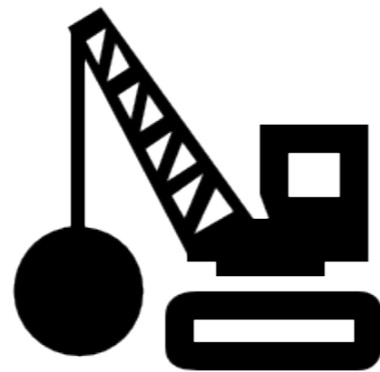
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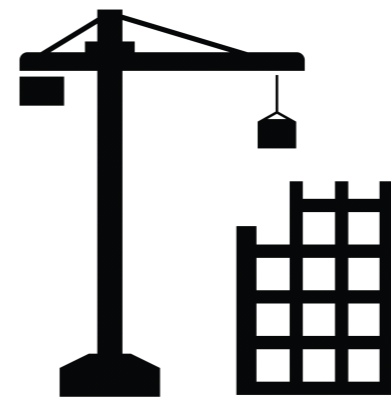
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Fixes



Educational
Rules Removed



Domain Rules
Added

Migration

Private access

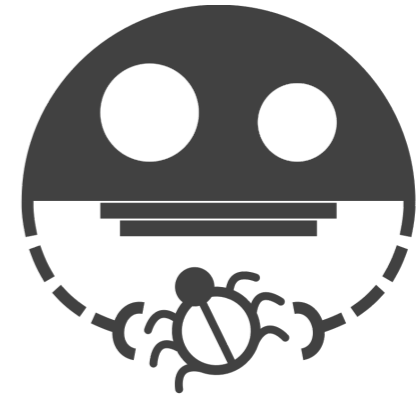
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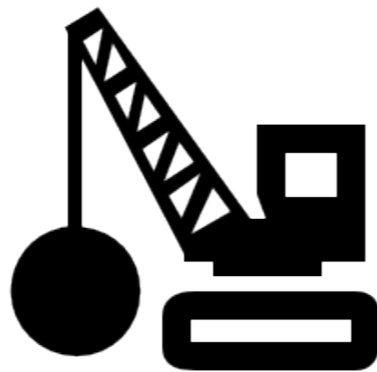
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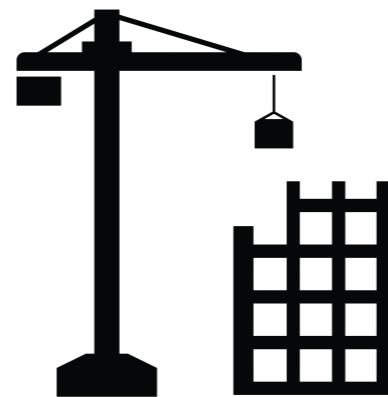
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Rules Removed



Domain Rules
Added

Migration

Private access

Invocation order

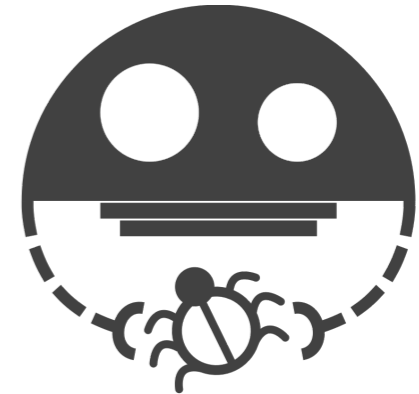
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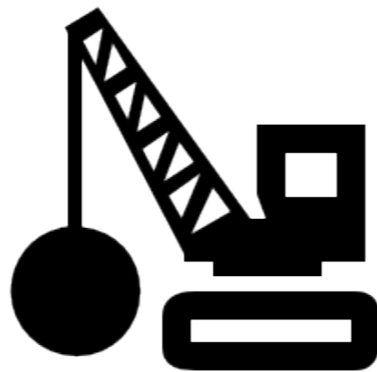
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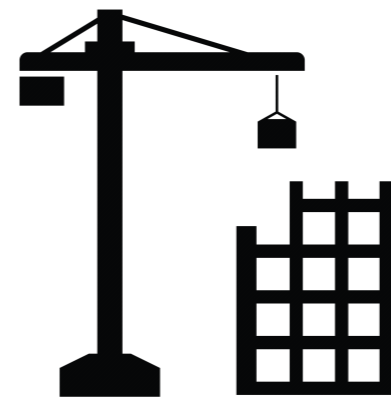
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Class structure

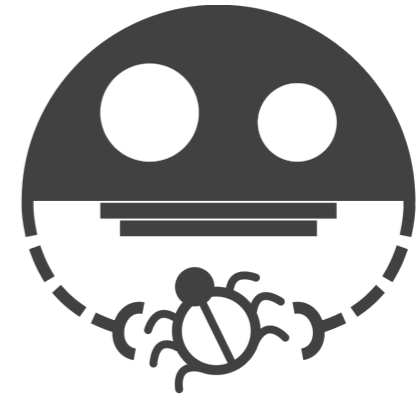
 [@yuriy_tymchuk](https://twitter.com/yuriy_tymchuk), *Mohammad Ghafari, Oscar Nierstrasz*

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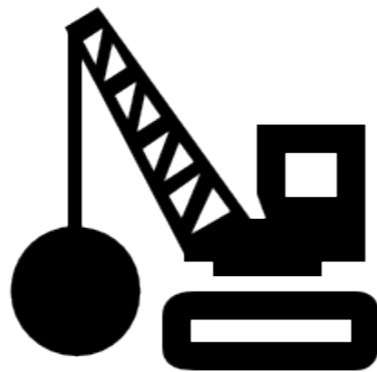
When QualityAssistant Meets Pharo



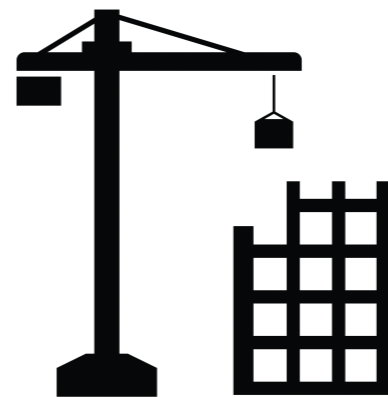
Enforced Code Critiques Motivate
More Valuable Rules



Important
Fixes



Educational
Rules Removed



Domain Rules
Added

Migration

Private access

Invocation order

Class structure

Lazy evaluation

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