

Optimizing **CI** using **Test Case Prioritization**

December 16, 2019

Pieter De Clercq

Overview

1. What is Continuous Integration?

Overview

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2. Problem

Overview

1. What is Continuous Integration?
2. Problem
3. Existing solutions

Overview

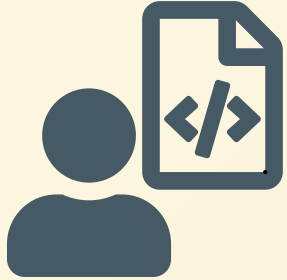
1. What is Continuous Integration?
2. Problem
3. Existing solutions
4. Roadmap

What is CI?

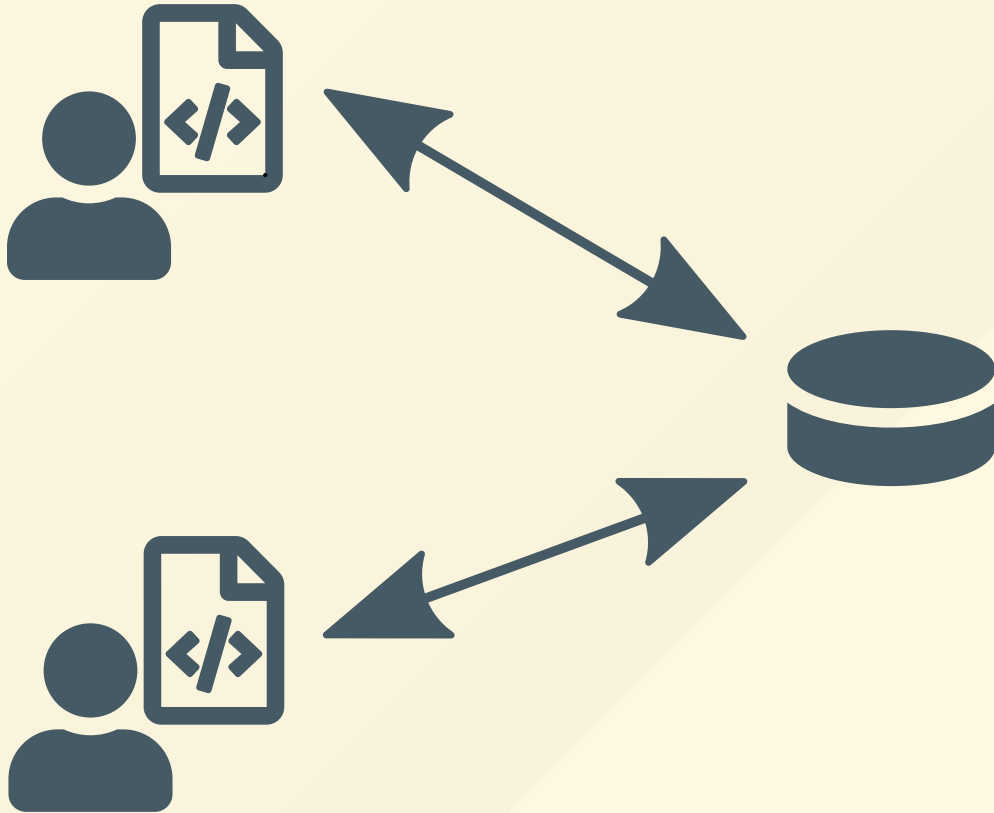
Agile Software Development



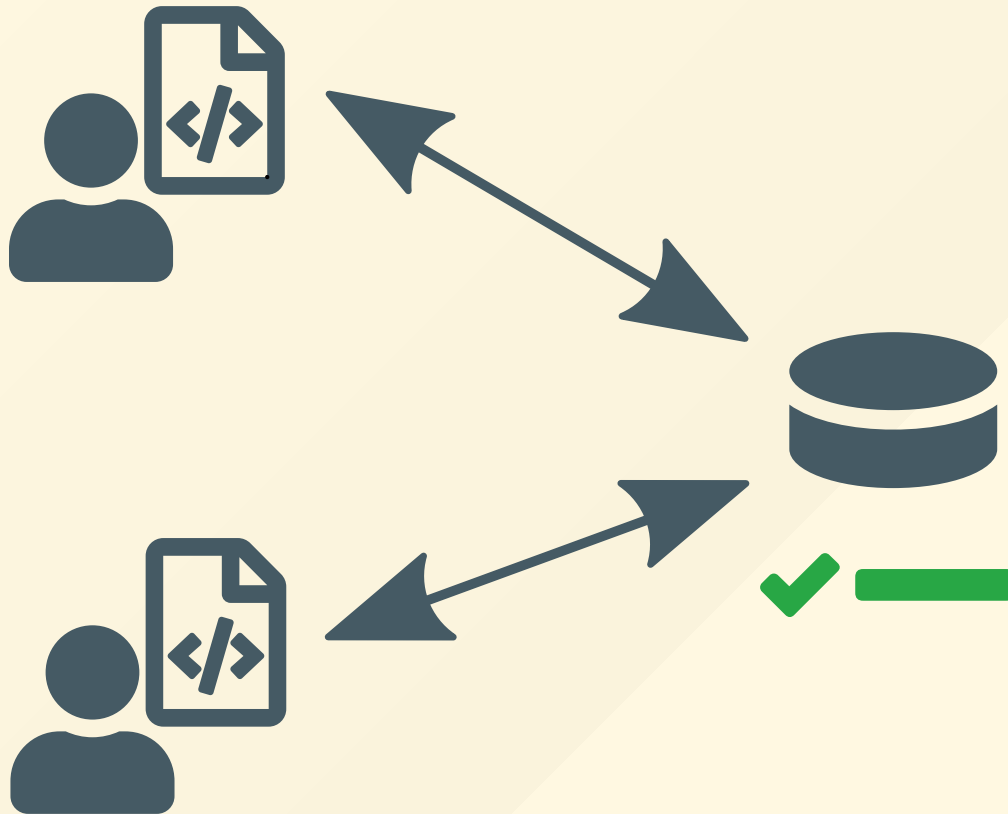
Agile Software Development



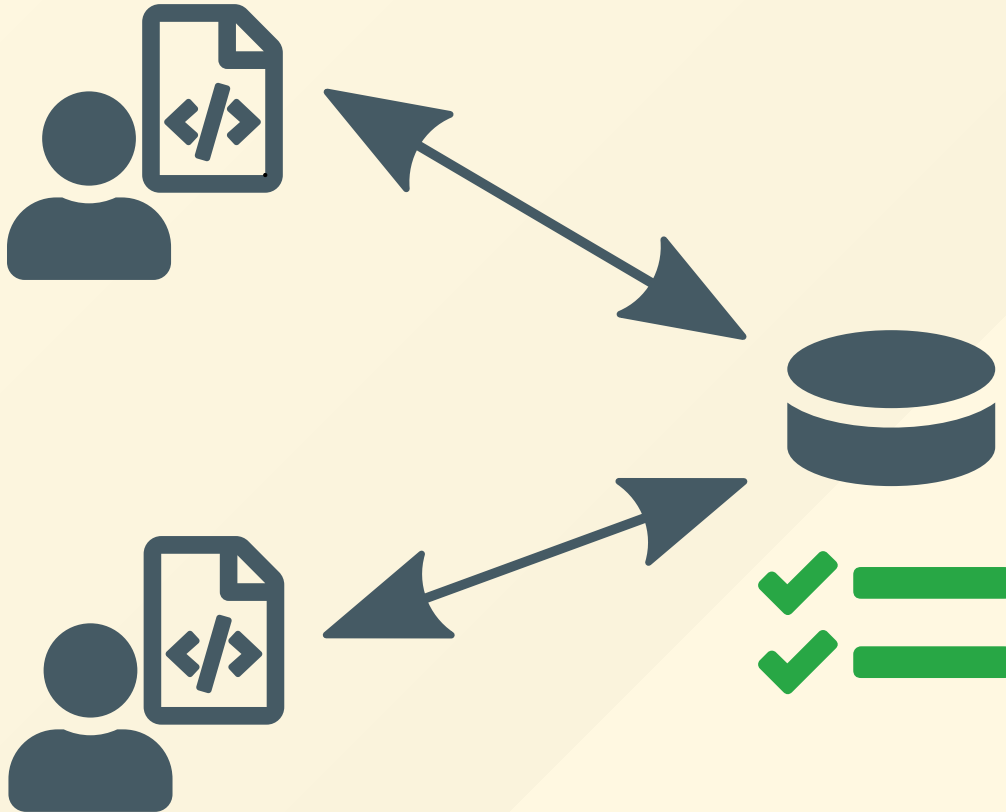
Agile Software Development



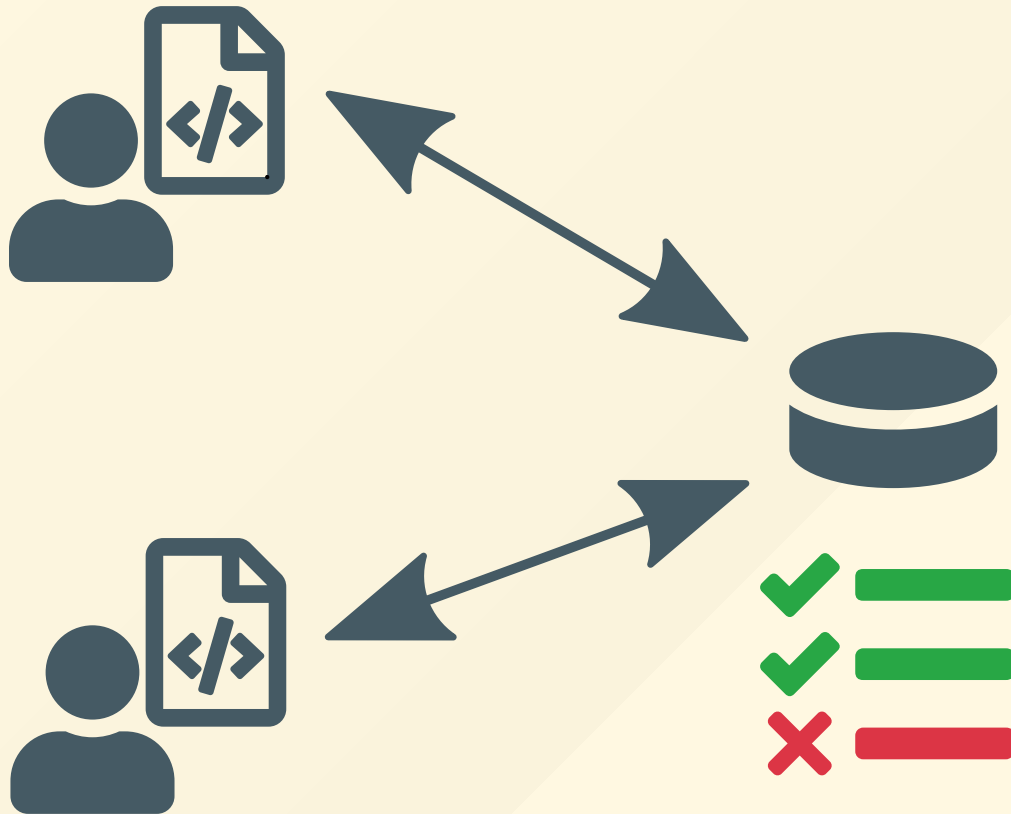
Agile Software Development



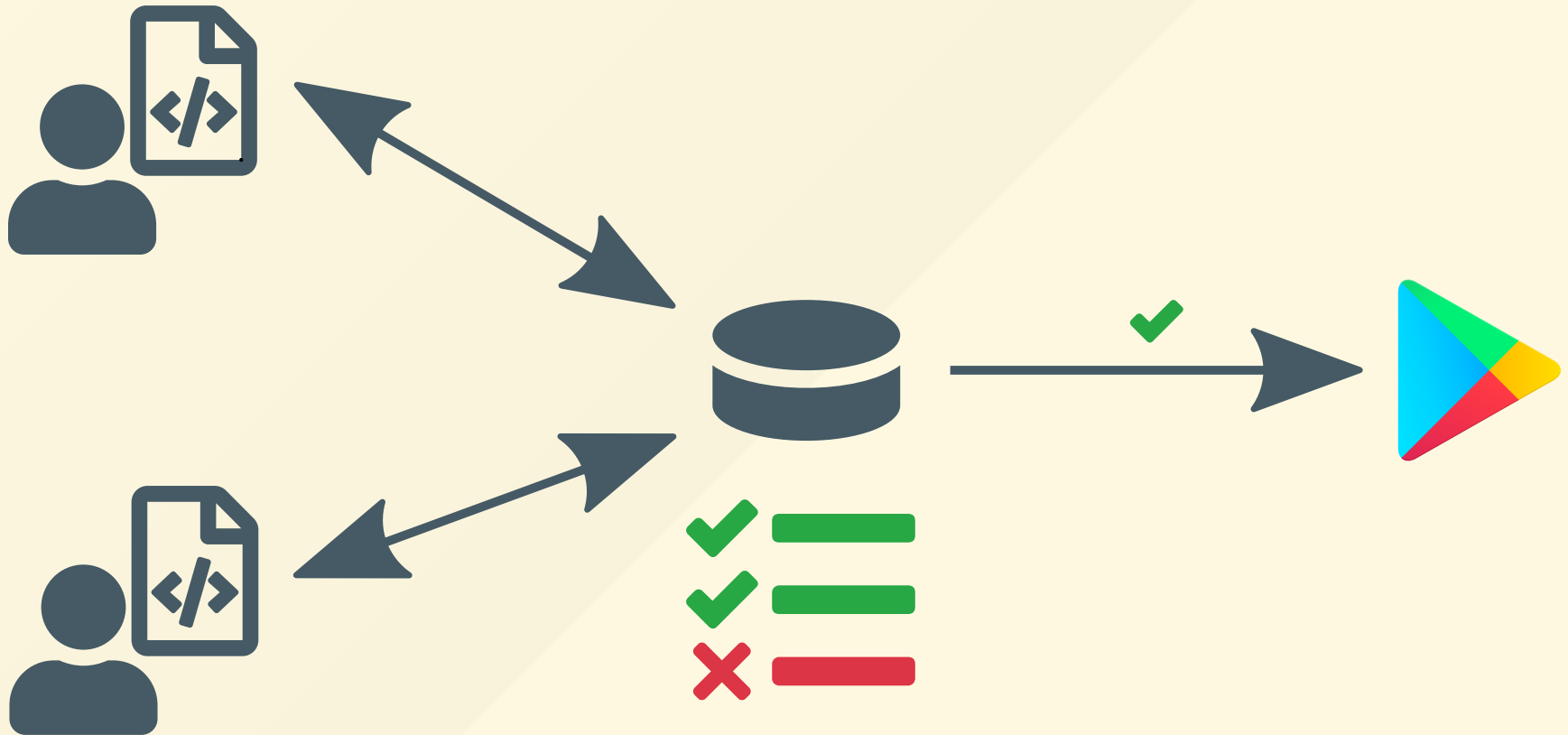
Agile Software Development



Agile Software Development



Agile Software Development



Problem

Tests!

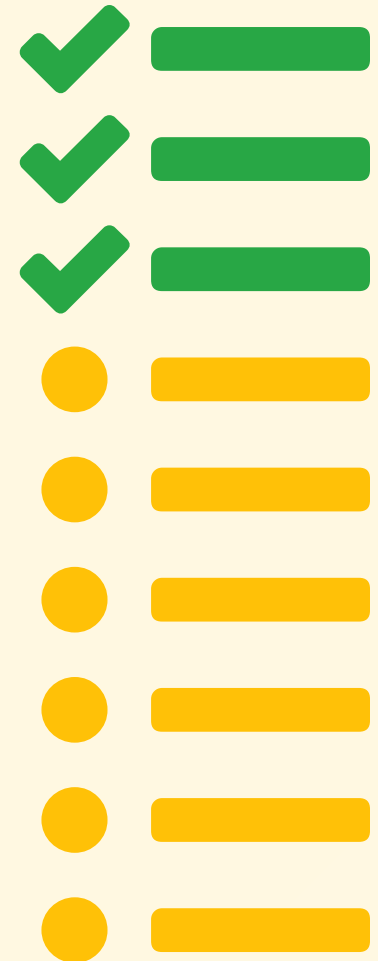
Tests



Tests



Tests



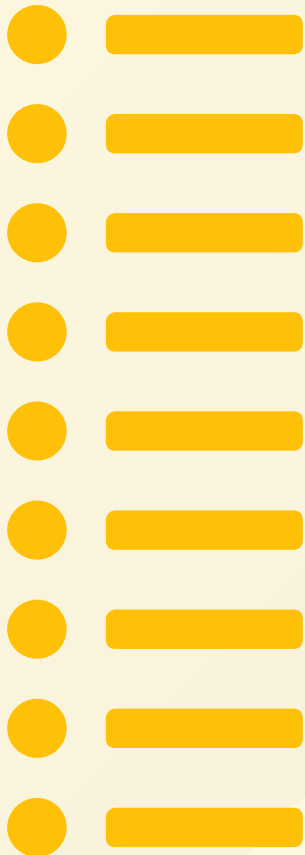
Existing solutions

Existing solutions

Test Case Selection

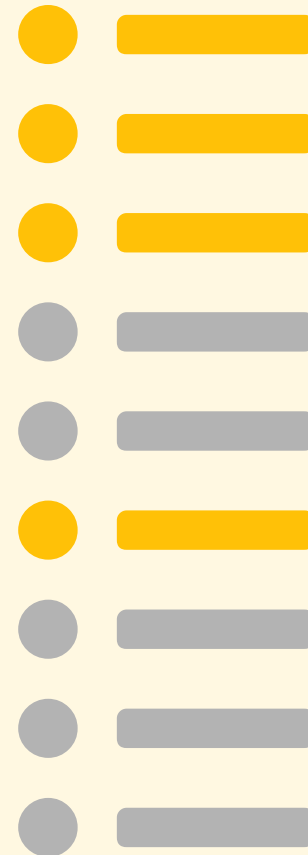
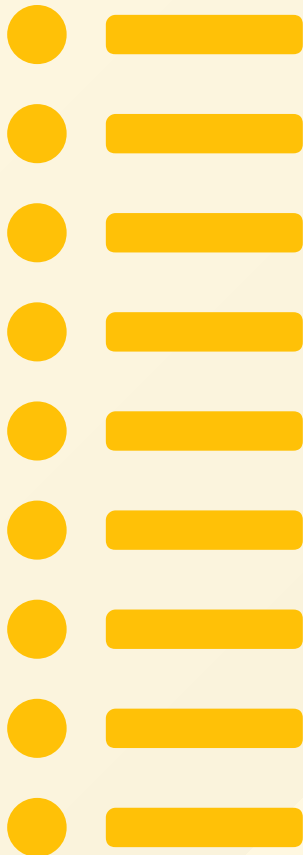
Existing solutions

Test Case Selection



Existing solutions

Test Case Selection

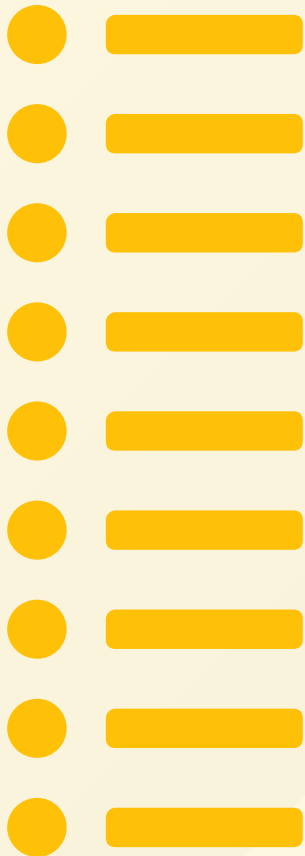


Existing solutions

Test Suite Minimisation

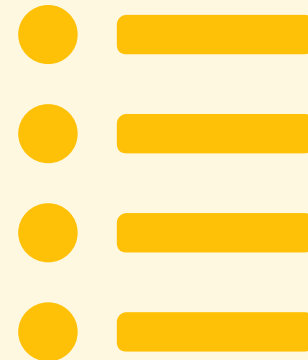
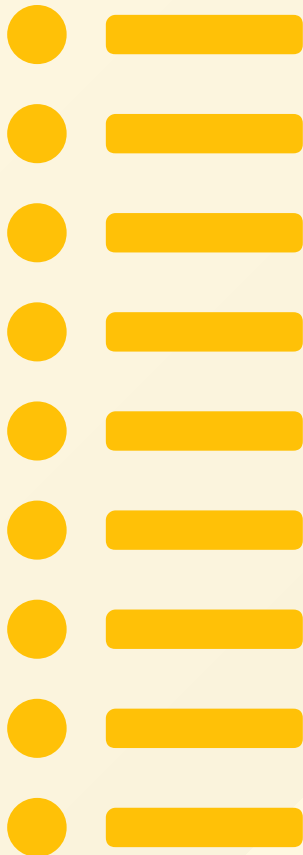
Existing solutions

Test Suite Minimisation



Existing solutions

Test Suite Minimisation

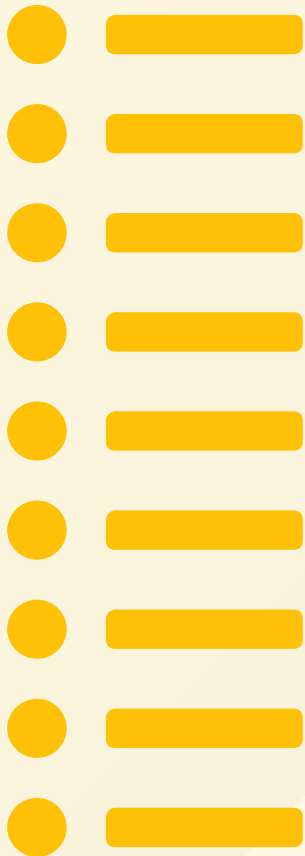


Existing solutions

Test Case Prioritization

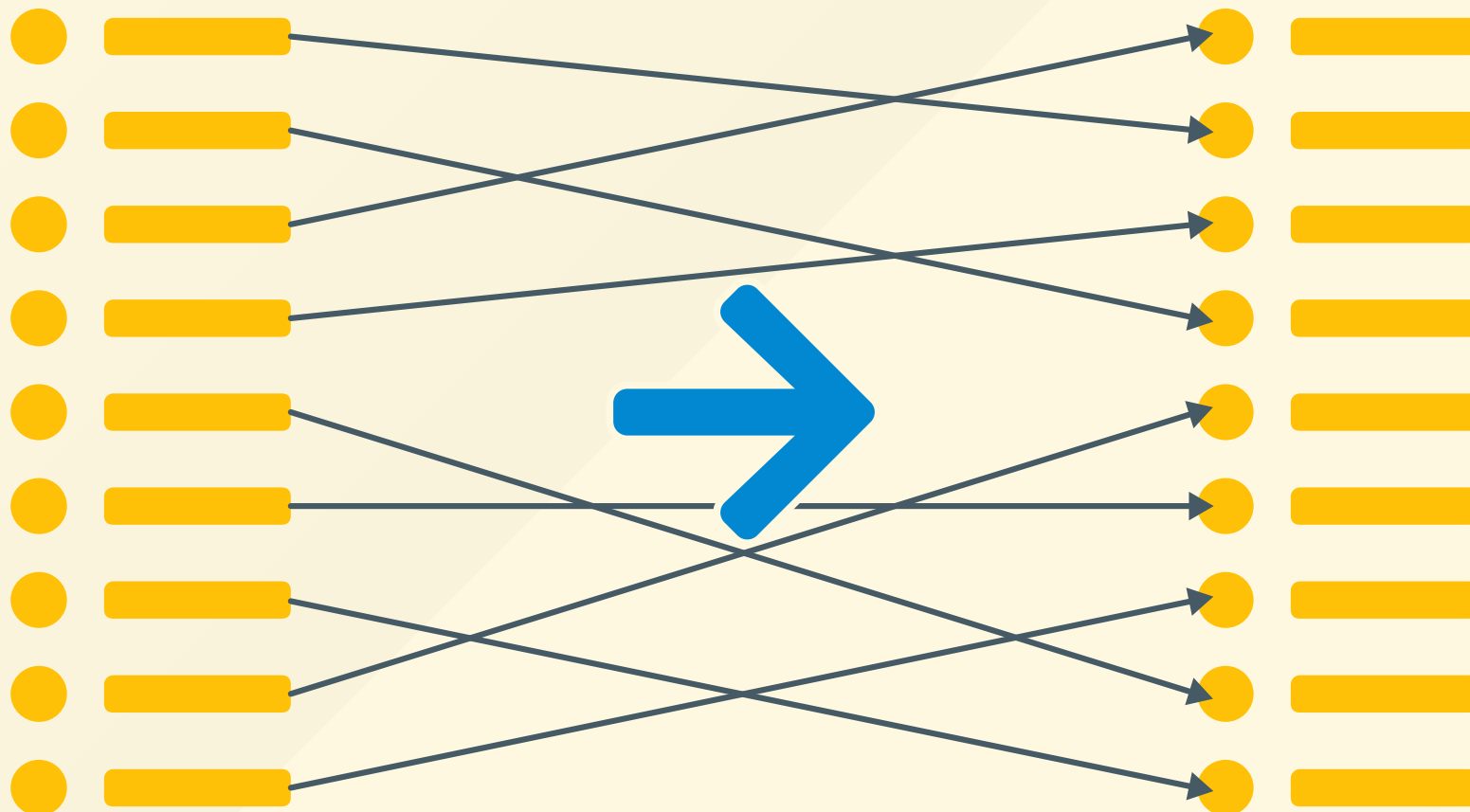
Existing solutions

Test Case Prioritization



Existing solutions

Test Case Prioritization



Existing solutions

Test Case Prioritization

- History based

Existing solutions

Test Case Prioritization

- History based
- Diversity (Coverage) based

Existing solutions

Test Case Prioritization

- History based
- Diversity (Coverage) based
 - Branch or Statement coverage?
 - Distance metric?

Existing solutions

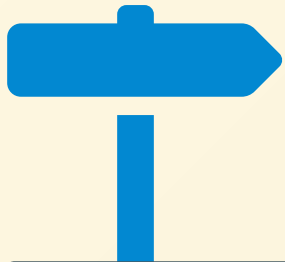
Test Case Prioritization

- History based
- Diversity (Coverage) based
 - Branch or Statement coverage?
 - Distance metric?
- Custom algorithms

Roadmap



Roadmap



Parsing

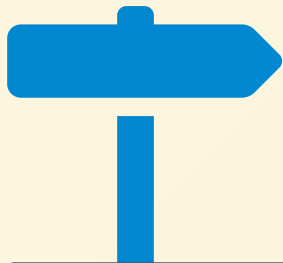


Literature study



Implementation

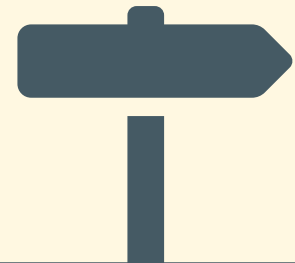
Roadmap



Parsing



Literature study



Implementation

✖ **Ruby**
on: push (6ae574e)

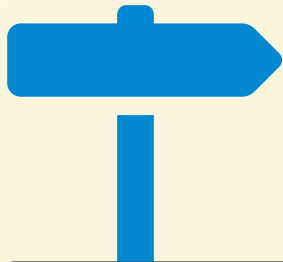
[fix/limit-diff-lines](#)
triggered by charvp

📅 2 months ago

...

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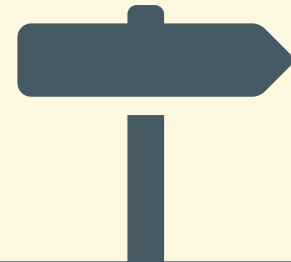
Roadmap



Parsing



Literature study



Implementation

✗ Ruby

on: push (6ae574e)

[fix/limit-diff-lines](#)

triggered by charvp

📅 2 months ago

...

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✗ master

Upgraded jaxb dependencies



Johan Haleby

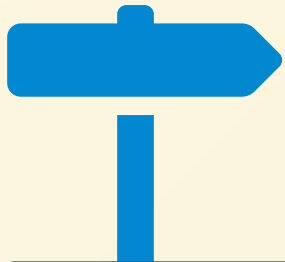
🔴 #857 failed

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🕒 16 min 30 sec

📅 3 months ago

Roadmap



Parsing



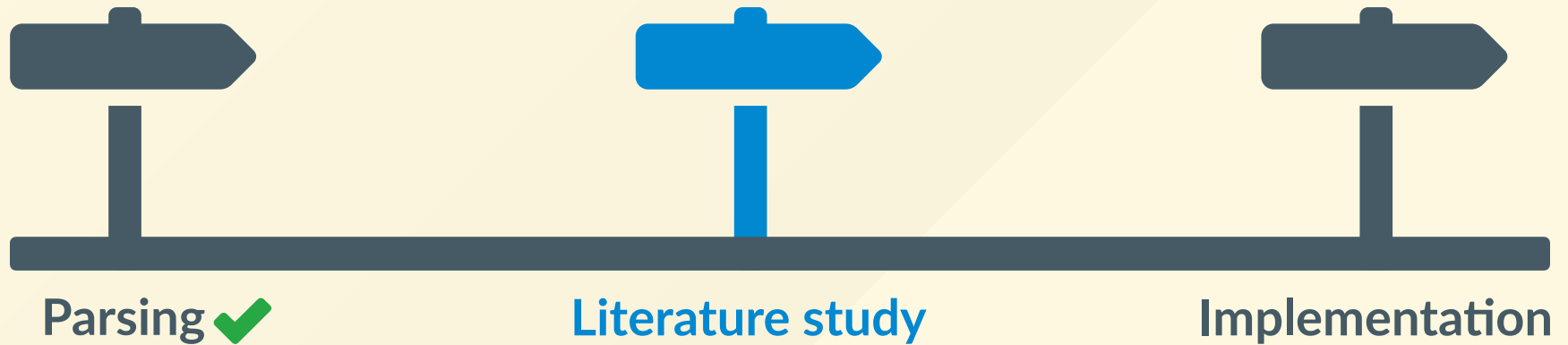
Literature study



Implementation

```
{
  "commit": "6ae574e65678a7c819846d5a836297d18d1f07af",
  "changes": [
    "app/helpers/renderers/feedback_table_renderer.rb",
    "app/helpers/renderers/lcs_html_differ.rb"
  ],
  "failing_tests": ["test/renderers/renderers_test.rb"]
}
```

Roadmap



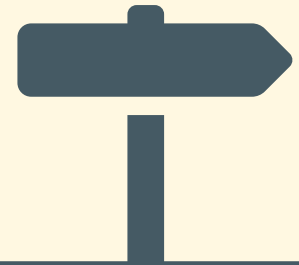
Roadmap



Parsing ✓



Literature study



Implementation

📄 16 pages

Roadmap



Roadmap



Parsing ✓



Literature study ●



Implementation

- Compare algorithms

Roadmap



Parsing ✓



Literature study ●



Implementation

- Compare algorithms
- Metapredictor

Roadmap



- Compare algorithms
- Metapredictor
- Plugin for Jenkins CI

“ Lost **time** is never found again.

-- *Benjamin Franklin*

”

Questions?

References

- Slides created using [Marp](#).
- Icons are property of [FontAwesome](#).