



Test Driven Development & Code Coverage

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Table Of Contents

01

**Test Driven
Development**

02

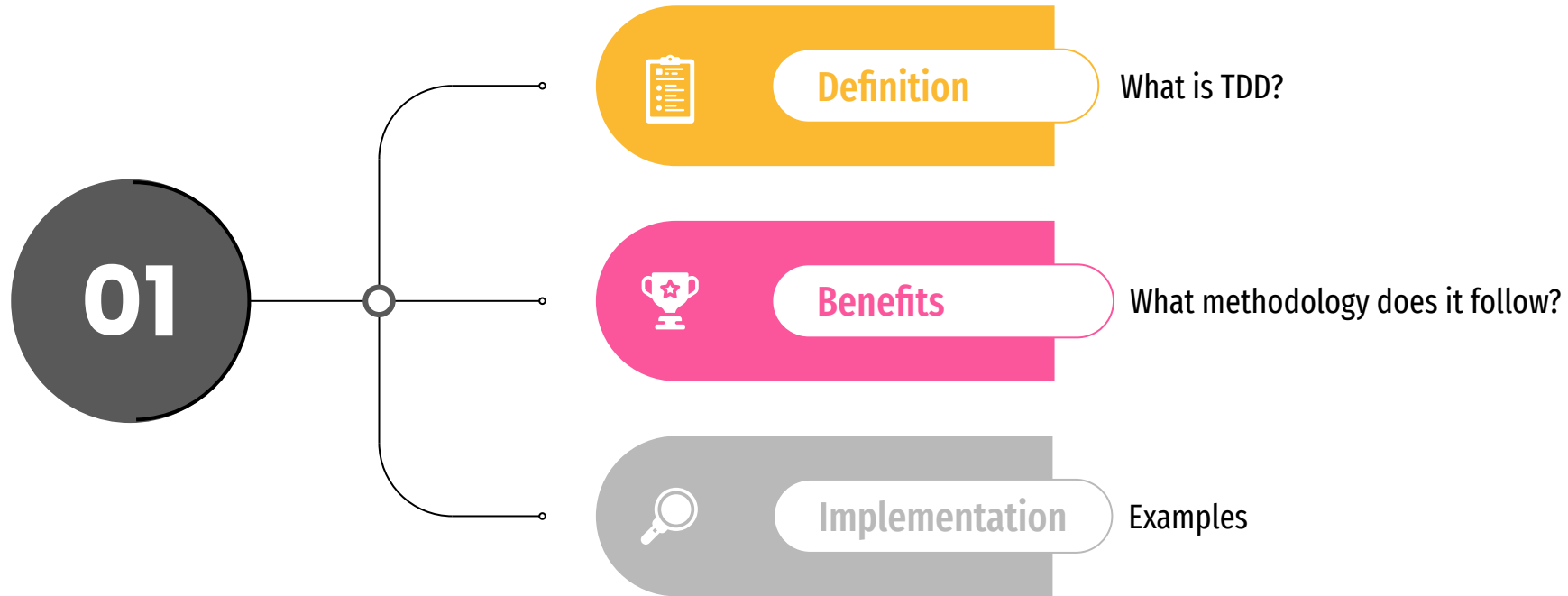
Code Coverage

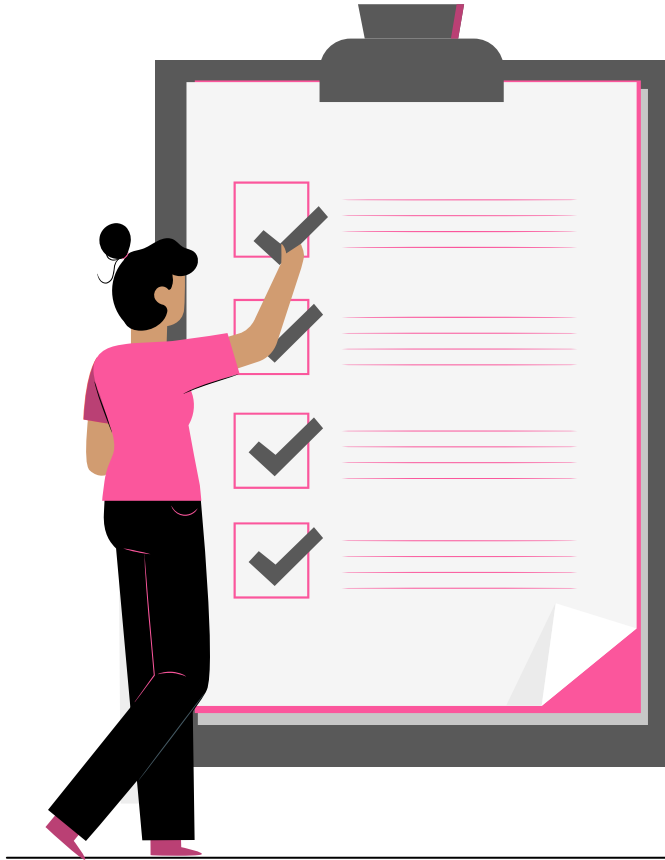
03

CodeCov



Test Driven Development

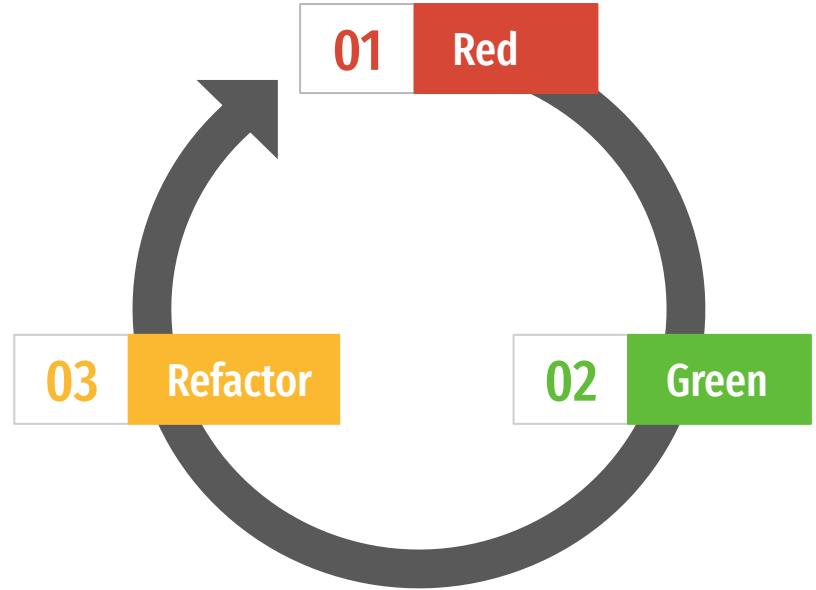




What is TDD?

Software development process which
combines test-first development and
refactoring

Methodology



Implementation

01

Red

```
describe('Yacht', () => {
  it('Yacht', () => {
    expect(score([5, 5, 5, 5, 5], 'yacht')).toEqual(50);
  });

  it('Not Yacht', () => {
    expect(score([1, 3, 3, 2, 5], 'yacht')).toEqual(0);
  });
});
```

Yacht

- 1) Yacht
- 2) Not Yacht

0 passing (13ms)
2 failing

1) Yacht

Yacht:

AssertionError: expected undefined to equal 50
at Context.<anonymous> (test/yatch.spec.js:9:48)
at processImmediate (internal/timers.js:461:21)

2) Yacht

Not Yacht:

AssertionError: expected undefined to equal 0
at Context.<anonymous> (test/yatch.spec.js:13:48)
at processImmediate (internal/timers.js:461:21)

Implementation

02

Green

```
const calculatePointsYacht = function(points) {  
  let repetitions = 0;  
  for (const element of points) {  
    if (element === points[0]) {  
      repetitions++;  
    }  
  }  
  if (repetitions === 5) {  
    return 50;  
  }  
  return 0;  
};
```

```
> mocha test/yatch.spec.js
```

Yacht

✓ Yacht

✓ Not Yacht

2 passing (9ms)

Implementation

03

Refactor



```
const calculatePointsYacht = function(points) {  
  if (points.every((score) => score === points[0])) {  
    return 50;  
  }  
  return 0  
};
```



```
> mocha test/yatch.spec.js
```

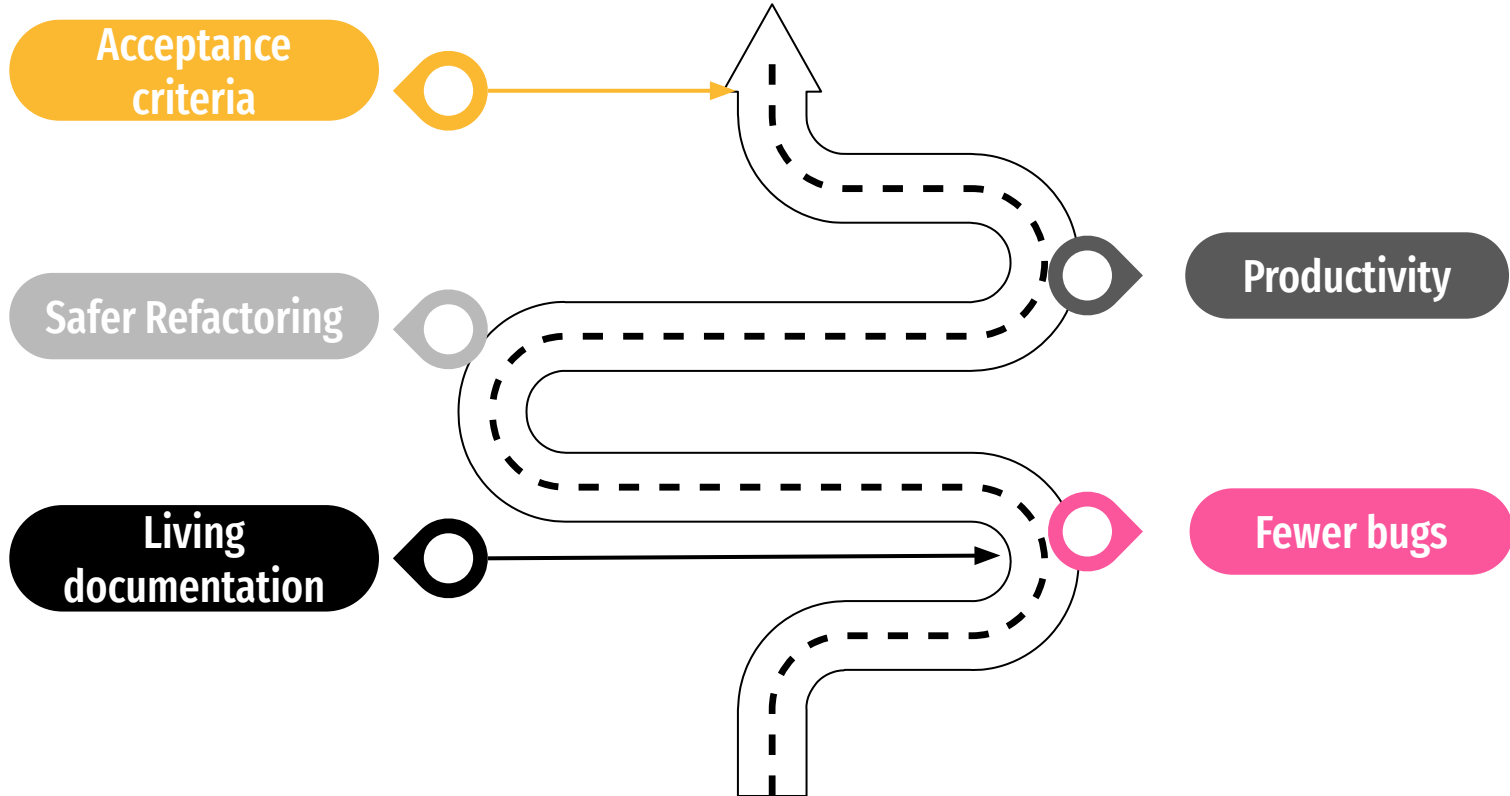
Yacht

✓ Yacht

✓ Not Yacht

2 passing (10ms)

Benefits



Code Coverage

02



Definition

What is code coverage?



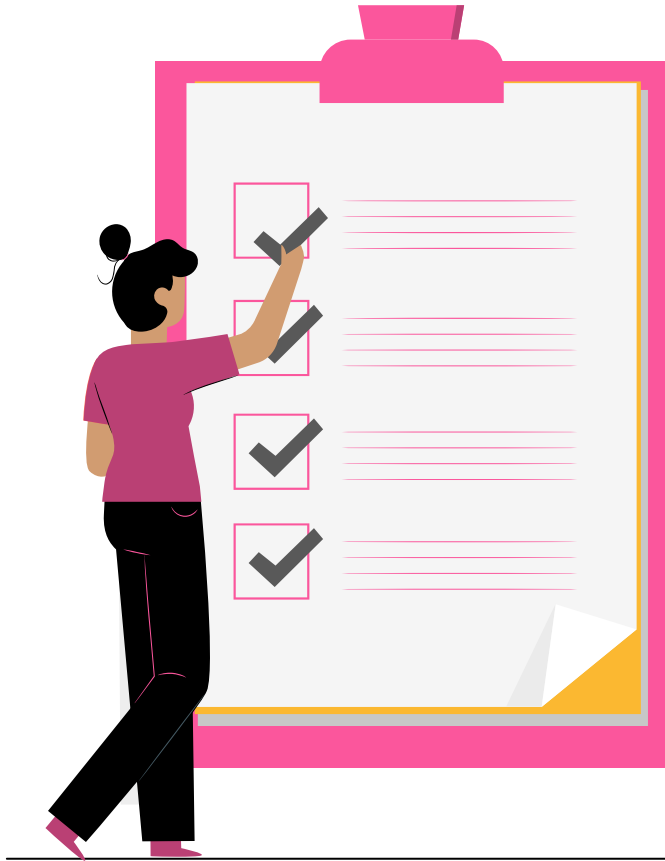
Benefits

What does code coverage provide?



Criteria

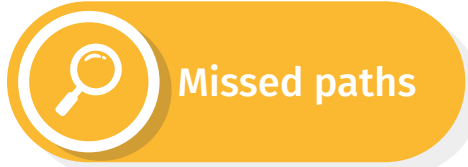
Which criteria does code coverage have?



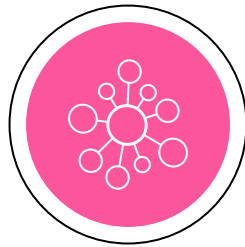
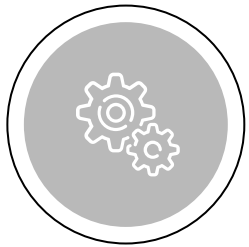
What is it?

Percentage of the code that has been tested.

Benefits



Coverage Criteria



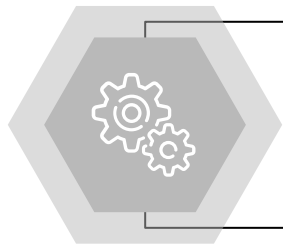
Function

Statement

Edge

Branch

Condition



Function Coverage



```
const uselessFunction = function(x, y) {  
  let z = 0;  
  if ((x > 0) || (y > 0)) {  
    z = x;  
  }  
  return z;  
};
```

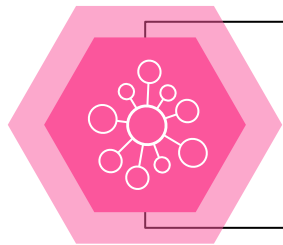
```
it('Function is being called', () => {  
  expect(uselessFunction(1, 1)).toEqual(1);  
});
```



Statement Coverage

```
const uselessFunction = function(x, y) {  
  let z = 0;  
  if ((x > 0) || (y > 0)) {  
    z = x;  
  }  
  return z;  
};
```

```
it('A statement is not being executed', () => {  
  expect(uselessFunction(-1, -1)).toEqual(0);  
});
```



Edge Coverage

```
const uselessFunction = function(x, y) {  
  let z = 0;  
  if ((x > 0) || (y > 0)) {  
    z = x;  
  }  
  return z;  
};
```

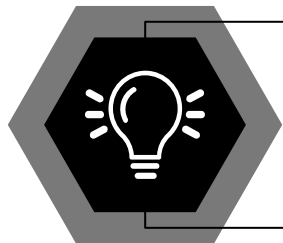
```
it('A path is not being executed', () => {  
  expect(uselessFunction(-1, 1)).toEqual(1);  
});
```




Branch Coverage

```
const uselessFunction = function(x, y) {  
  let z = 0;  
  if ((x > 0) || (y > 0)) {  
    z = x;  
  }  
  return z;  
};
```

```
it('A branch is not being executed', () => {  
  expect(uselessFunction(1, 1)).toEqual(1);  
});
```



Condition Coverage

```
const uselessFunction = function(x, y) {  
  let z = 0;  
  if ((x > 0) || (y > 0)) {  
    z = x;  
  }  
  return z;  
};
```

```
it('Boolean sub-expressions evaluated both to true and false', () => {  
  expect(uselessFunction(-1, 1)).toEqual(1);  
  expect(uselessFunction(1, -1)).toEqual(1);  
});
```



Branch Coverage

VS

Condition Coverage



```
const anotherUselessFunction = function(a, b) {  
  if (a && b) {  
    ...  
  }  
};
```

```
it('Condition satisfied but Branch unsatisfied', () => {  
  expect(anotherUselessFunction(-1, 1)).toEqual(undefined);  
  expect(anotherUselessFunction(1, -1)).toEqual(undefined);  
});
```

CodeCov

03



Definition

What is CodeCov.io?



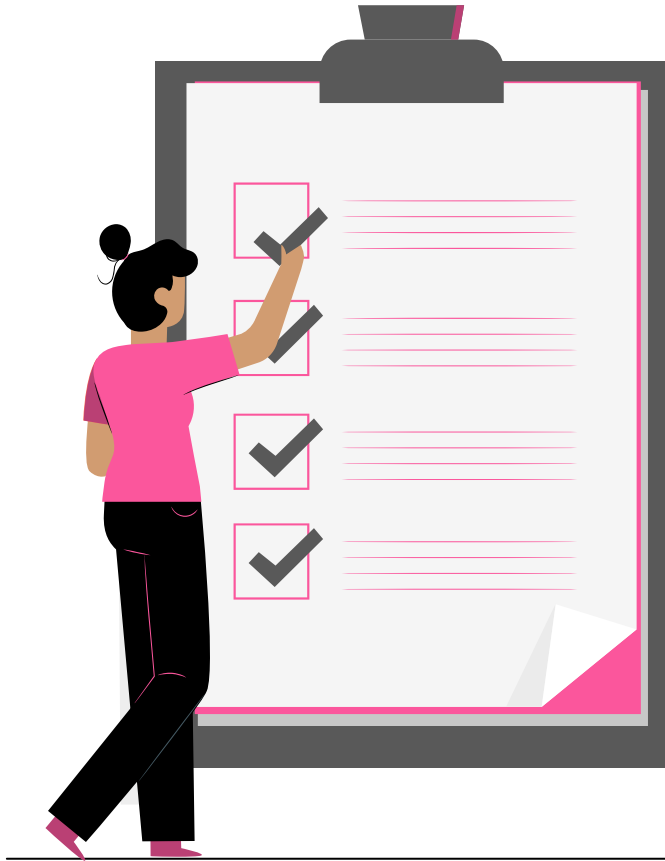
Features

What does this tool provide?



Live Demo

What do we need?



What is CodeCov?

Tool used to measure the test coverage of a codebase.

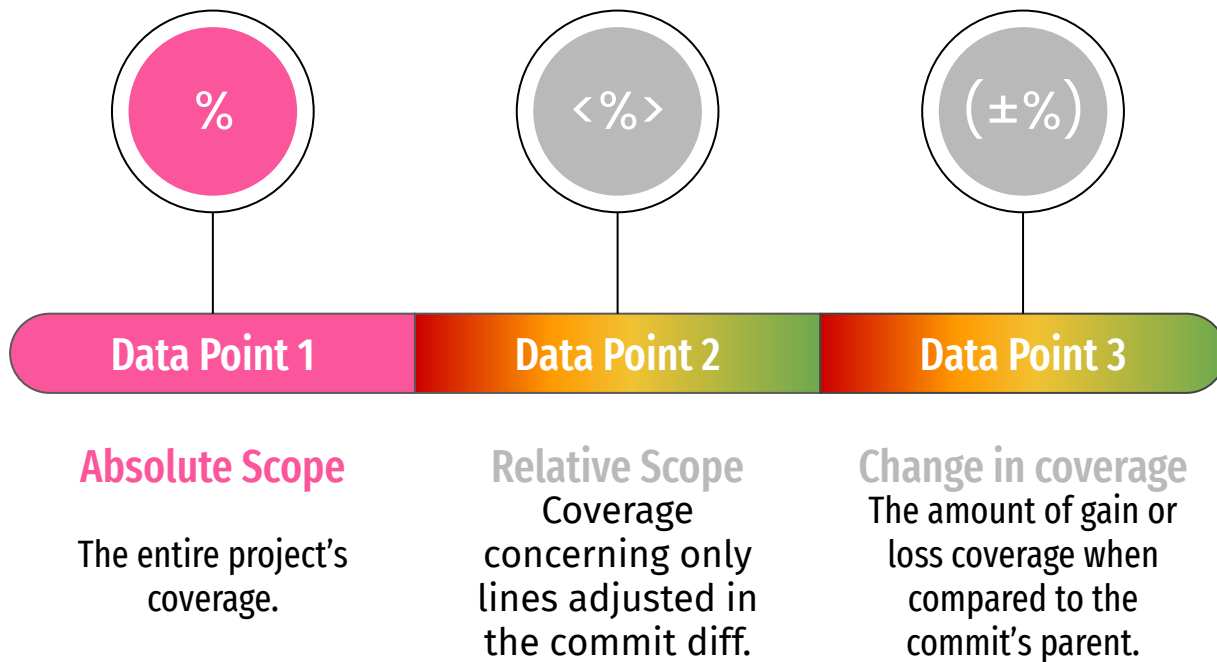


Coverage increase after 30 days

**(for repositories starting below 70% coverage)*



CodeCov Delta



Viewing Source Code



Line covered and executed



Branches that do not have all their paths covered or executed



Line covered and executed



Line was covered before the current commit but it is now partially hit



Line was covered before the current commit but it is now missed

Coverage ratio

hits / (sum of hit + partial + miss)

“Codecov delivers or “injects” coverage metrics directly into the modern workflow to promote more code coverage, especially in pull requests where new features and bug fixes commonly occur.”



Top 5 Features



01

Pull requests comments

02

Commit status

03

Merging reports

04

Flags

05

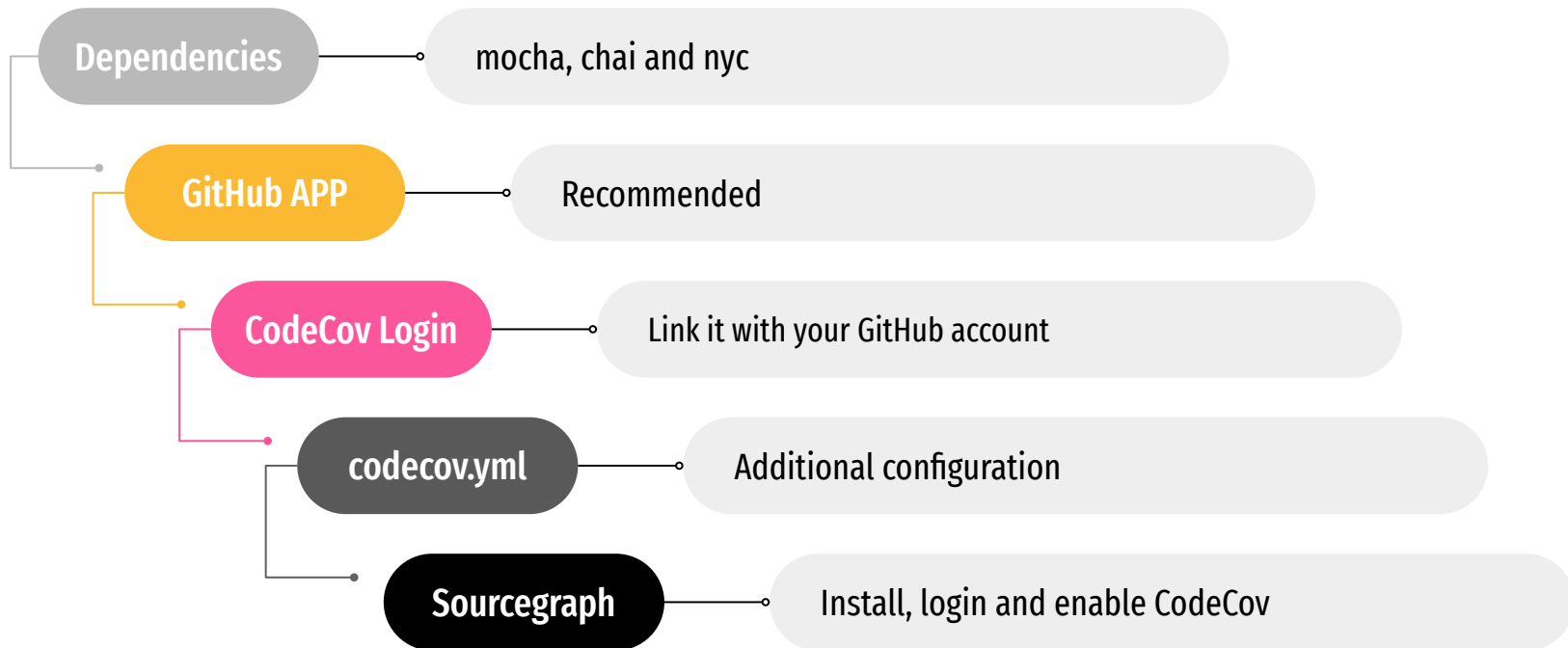
Path Manipulation



Overlay reports directly in the user's
code host of choice

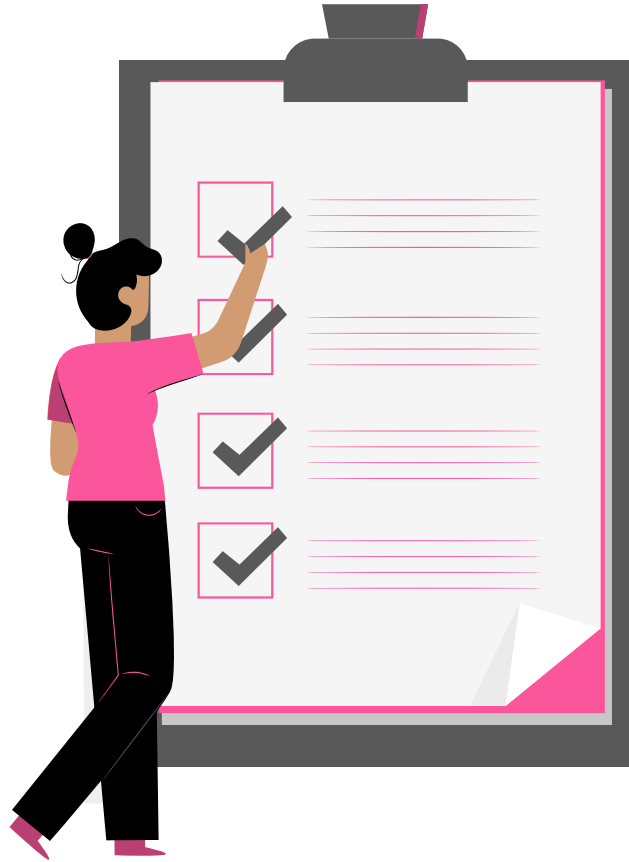


Quick Start



Live Demonstration





Conclusions

- Get used to the TDD methodology.
- Improve your code coverage.
- Always report your test coverage.
- Practice makes perfect.

Bibliography

Test Driven Development

- [Introduction to Test Driven Development](#)
- [Learn Test Driven Development](#)
- [Introduction to Test Driven Development in JavaScript](#)
- [Refactoring JavaScript](#)
- [9 Benefits of Test Driven Development](#)
- [Testing - Mocha and Chai presentation repository. Adal Diaz, Oscar Moreira](#)

Code Coverage

- [Code Coverage](#)
- [Everything you need to know about Code Coverage](#)
- [Chai Assertion Library Documentation](#)
- [Istanbul Test Coverage Tool Documentation](#)
- [Mocha Documentation](#)

CodeCov.io

- [CodeCov Documentation](#)
- [Quick Start](#)
- [Codecov Github APP](#)
- [2020 State of Open Source Coverage](#)
- [13 CodeCov alternatives](#)

SourceGraph

- [CodeCov Sourcegraph extension](#)
- [CodeCov's additional information](#)

FreePik

Slidesgo



Thanks for your attention

Any Questions?



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