PAINLESS JAVASCRIPT TESTING WITH CODECEPTJS

by Michael Bodnarchuk

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ABOUT ME

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- Web developer from Kyiv, Ukraine
- Lead developer of **CodeceptJS**
- Also author of Codeception, Robo and others
- Tech **Consultant**, CTO at SDCLabs

MY VISION

- Tests should be simple to write and understand
- Tests have their priority. Don't write tests for everything
- Tests should follow business values
- Testing should be joyful

WHAT'S WRONG WITH END 2 END TESTS?

IN JAVASCRIPT

```
product.element.all(by.xpath(cons.xpathproductRate())).then(function (pr
    var i = products.length;
    (function loop() {
        product.sleep(1000);
        var product = cons.xpathproductRate(i);
        product.element(by.xpath(product)).click().then(function () {
            main.waitForElementAndClick(product, cons.linkRemoveproduct)
                main.waitForElementAndClick(product, cons.radiobtnRemove
                    main.waitForElementAndClick(product, cons.btnRemovep
                        i = i - 1;
                        if (i > 0) {
                            loop();
                        }
                    });
                });
            });
        });
    })();
```

SOLUTION

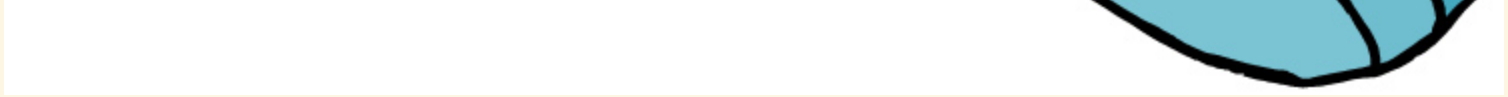
```
When I remove all products from a list
```

- Use Cucumber & BDD!

BEHIND THE SCENE

```
When('I remove all products from a list', function() {

  product.element.all(by.xpath(cons.xpathproductRate())).then(function (
      var i = products.length;
      (function loop() {
          product.sleep(1000);
          var product = cons.xpathproductRate(i);
          product.element(by.xpath(product)).click().then(function () {
              main.waitForElementAndClick(product, cons.linkRemoveproduc
                  main.waitForElementAndClick(product, cons.radiobtnRemo
                      main.waitForElementAndClick(product, cons.btnRemov
                          i = i - 1;
                          if (i > 0) {
                              loop();
                          }
                      });
                  });
              });
```



OVERENGINEERING

- Focused on browser control
- Focused on tools: Protractor/Cypress/webdriverio
- Asynchronity / Promises

FOCUS ON TEST SCENARIO!

I am on page "/login"

I fill field "Username" with "davert"

I click "Login"

I see "Welcome, davert"

USUALLY A TEST CONSISTS OF ACTIONS:

- open a page
- click
- see text / element
- fill field
- ...

KEEP CODE SIMPLE

- Make a test follow user scenario
- Use highly flexible predefined actions
- Follow line-by-line structure
- Don't care of how it will be executed

A TEST SHOULD LOOK LIKE THIS

```
Scenario('Create a new store', (I, SettingsPage) => {
  SettingsPage.open();
  const storeName = faker.lorem.slug();
  I.dontSee(storeName, '.settings');                          // Assert
  I.click('Add', '.settings');                                // Click l
  I.fillField('Store Name', storeName);                       // Fill fi
  I.fillField('Email', faker.internet.email());
  I.fillField('Telephone', faker.phone.phoneNumberFormat());
  I.selectInDropdown('Status', 'Active');                     // Use cus
  I.click('Create');                                  // Auto-retry flaky
  I.waitInUrl('/settings/setup/stores');                      // Explici
  I.see(storeName, '.settings');                              // Assert
}).tag('stores');
```

HOW IT IS EXECUTED?

- Is that WebDriver?
- Is that Cypress?
- Is that TestCafe?
- Is that Puppeteer?

ANY OF THOSE!

CODECEPTJS

codecept.io

CODECEPTJS

- **end to end** testing framework
- helpers for popular testing backend
- high-level **unified APIs** for all backends
- **~50K** weekly installations

codecept.io

SAMPLE TEST

```
Scenario('todomvc', (I) => {
  I.amOnPage('http://todomvc.com/examples/react/');
  I.waitForElement('.new-todo');
  I.dontSeeElement('.todo-count');
  I.fillField('What needs to be done?', 'Write a guide');
  I.pressKey('Enter');
  I.see('Write a guide', '.todo-list');
  I.see('1 item left', '.todo-count');
  I.fillField('What needs to be done?', 'Write a test');
  I.pressKey('Enter');
  I.see('Write a test', '.todo-list');
  I.see('2 items left', '.todo-count');
  I.fillField('What needs to be done?', 'Write a code');
  I.pressKey('Enter');
  I.see('Write a code', '.todo-list');
  I.see('3 items left', '.todo-count');
});
```

```
const checkinDate = moment().add(3, 'months');

Feature('Todo');



Scenario('todomvc', (I) => {
  I.amOnPage('http://todomvc.com/examples/react/');
  I.waitForElement('.new-todo');
  I.dontSeeElement('.todo-count');
  I.fillField('What needs to be done?', 'Write a guide');
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  I.pressKey('Enter');
  I.see('Write a code', '.todo-list');
  I.see('3 items left', '.todo-count');
});
```
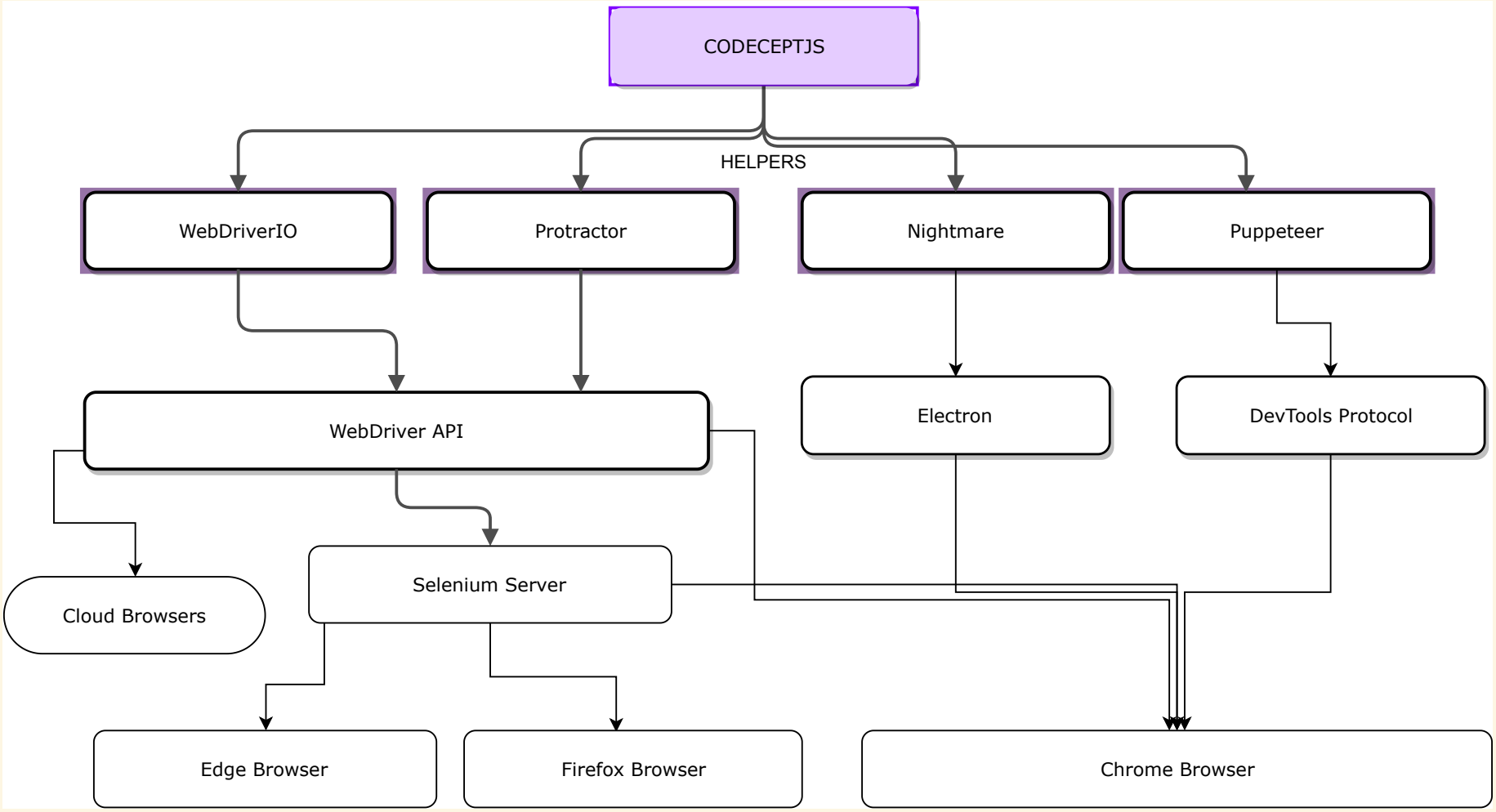

ARCHITECTURE



META-FRAMEWORK

- Tests can be run by Selenium, Puppeteer, TestCafe, Appium, Protractor,...
- Tests use the same interface
- If a new tool emerges it's easy to add it
- If an edgecase is hit, it's easy to migrate tests

PROBLEMS TO SOLVE

- Flaky Actions
- Flaky Locators
- Complex Locators
- Debugging
- Reporting
- Parallel Execution
- Data Management

SOLUTION 👉 FLAKY ACTIONS

- Use `autoRety` plugin
- Explicitly retry flaky steps

```
I.retry(2).click('Link');
```

- Use wait* commands

```
I.waitForElement('.modal');
```

FLAKY LOCATORS

- Focus on semantic locators
  - placholders
  - links
  - buttons
  - form element names
- Use CSS/XPath for stable parts
- Locator builder

SIMPLIFY COMPLEX LOCATORS

```
locate('//table')
  .find('a')
  .withText('Edit')
  .as('edit button')

// transformed to XPath
```

READABILITY

- Focus on user actions
- Hide implementation
- Use semantic elements
- Scenarios are easy to follow

READABILITY EXAMPLE

```
I.amOnPage('/');
I.click('Sign in', 'header');
I.see('Sign in', 'h1');
I.fillField('Username or email address', 'something@totest.com');
I.fillField('Password', '123456');
I.click('Sign in');
I.see('Welcome!');
```

READABILITY & REUSABILITY

```
Scenario('publish an article', async (I, loginPage) => {
  const user = await I.have('user', { name: 'davert' });
  loginPage.login(davert);
  I.see('User logged in', loginPage.messageBox);
  I.click('New', '.articles');
  within('.new-article', () => {
    I.fillField('title', 'My new article');
    I.fillField('body', 'Very important message');
    I.click('Publish');
  });
  I.see('Article was published', '.message');
});
```

BDD: +1 ABSTRACTION LAYER

```
Scenario:
  Given I have product with $600 price in my cart
  And I have product with $1000 price
  When I go to checkout process
  Then I should see that total number of products is 2
  And my order amount is $1600
```

CODECEPTJS HAS BUILT IN CUCUMBER

- To write business scenarios
- To automate business sceanrios as tests
- To combine regression tests and business scenarios

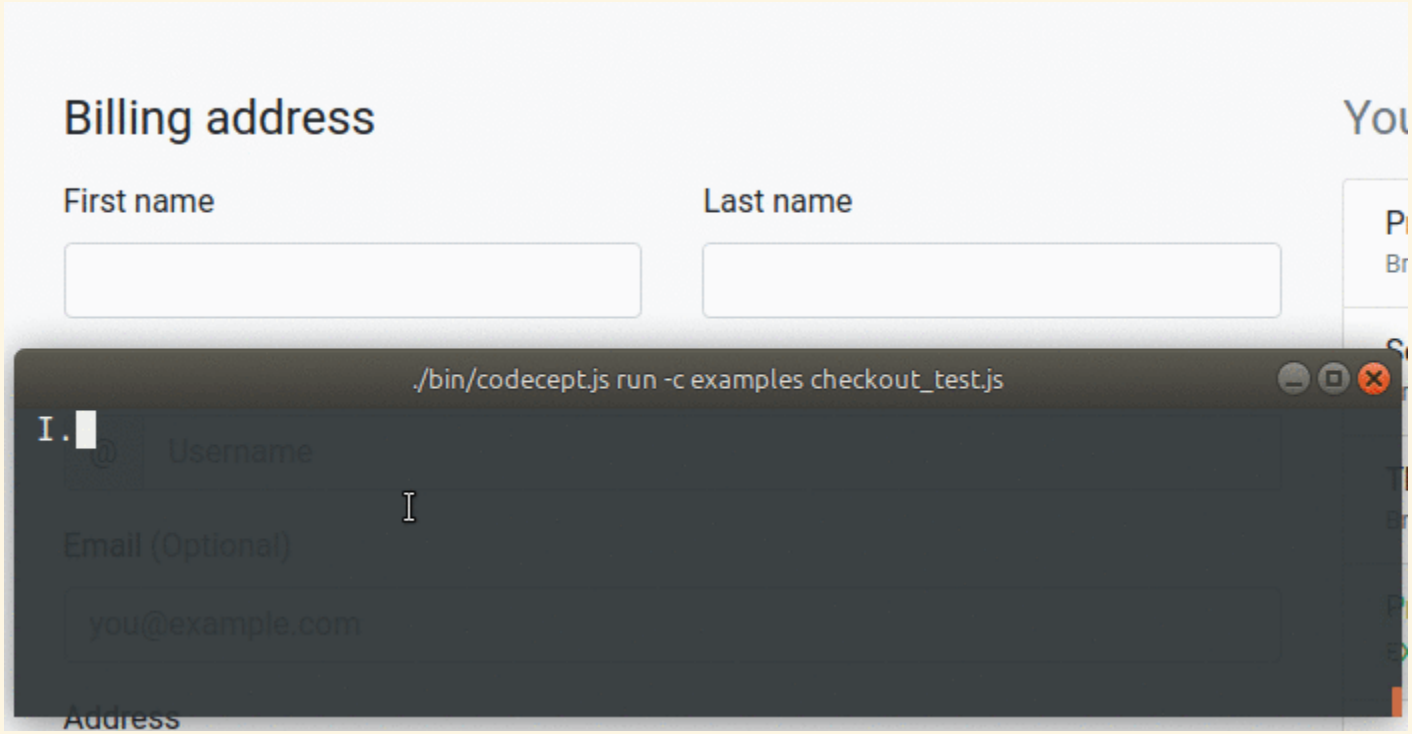
PROMISES

```
I.amOnPage('/validation_code');
I.see('Your Validation Code:');
let code = await I.grabValueFrom('#code')
```

- Browser commands are asynchronous
- Global promise recorder
- **`await`** is used when execution should be interrupted

LIVE DEVELOPMENT

```
I.amOnPage('/checkout');
pause();
```



DEBUGGING

- Pause execution whenever you want
- Automatically saved screenshot on fail

```
After(pause);
```

DATA MANAGEMENT

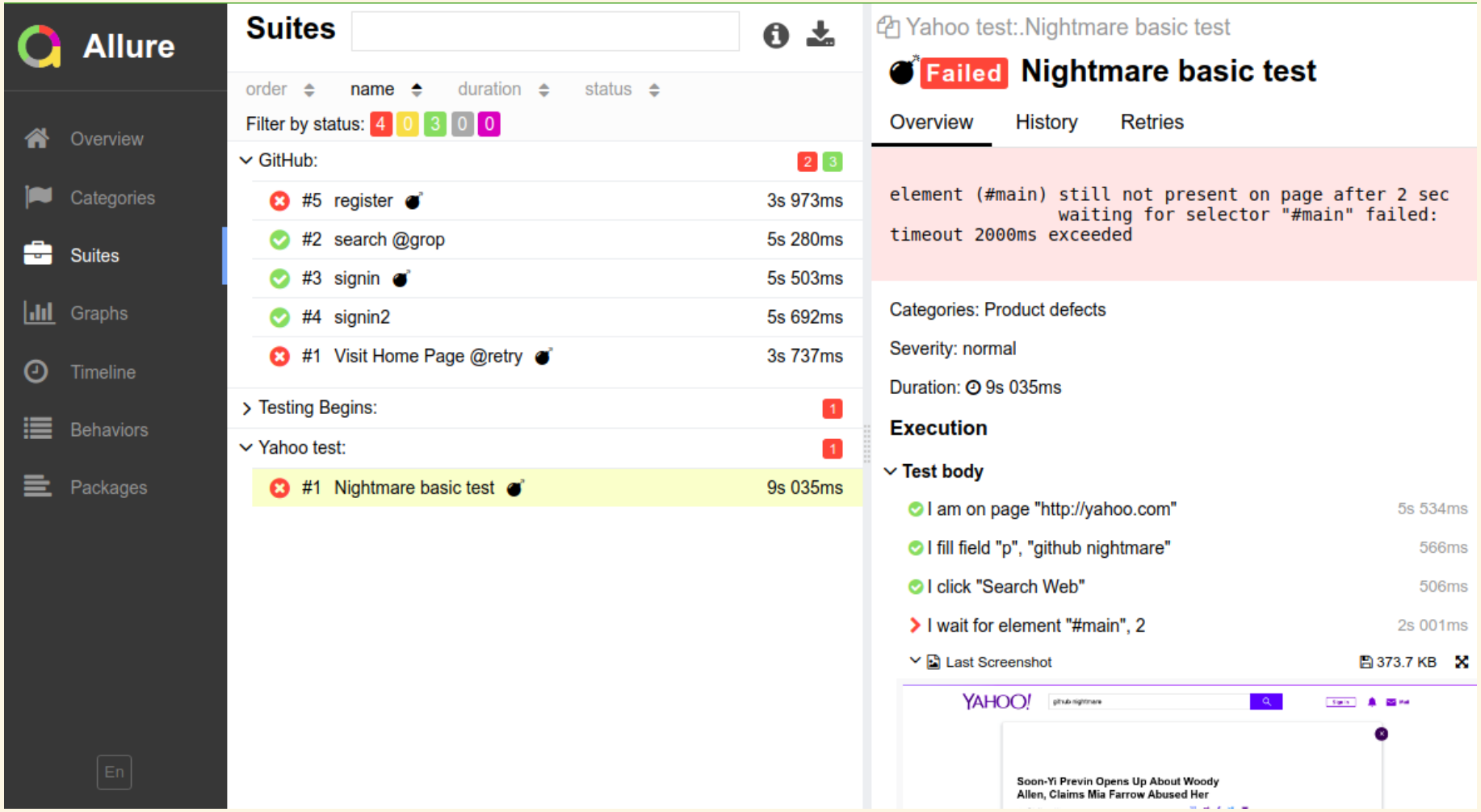
Generate and store all data via **REST** or **GraphQL**

```
const product = await I.have('product');
const review = await I.have('review', { product_id: product.id });
```

PARALLEL EXECUTION

```
npx codeceptjs run-workers 3
```

REPORTING



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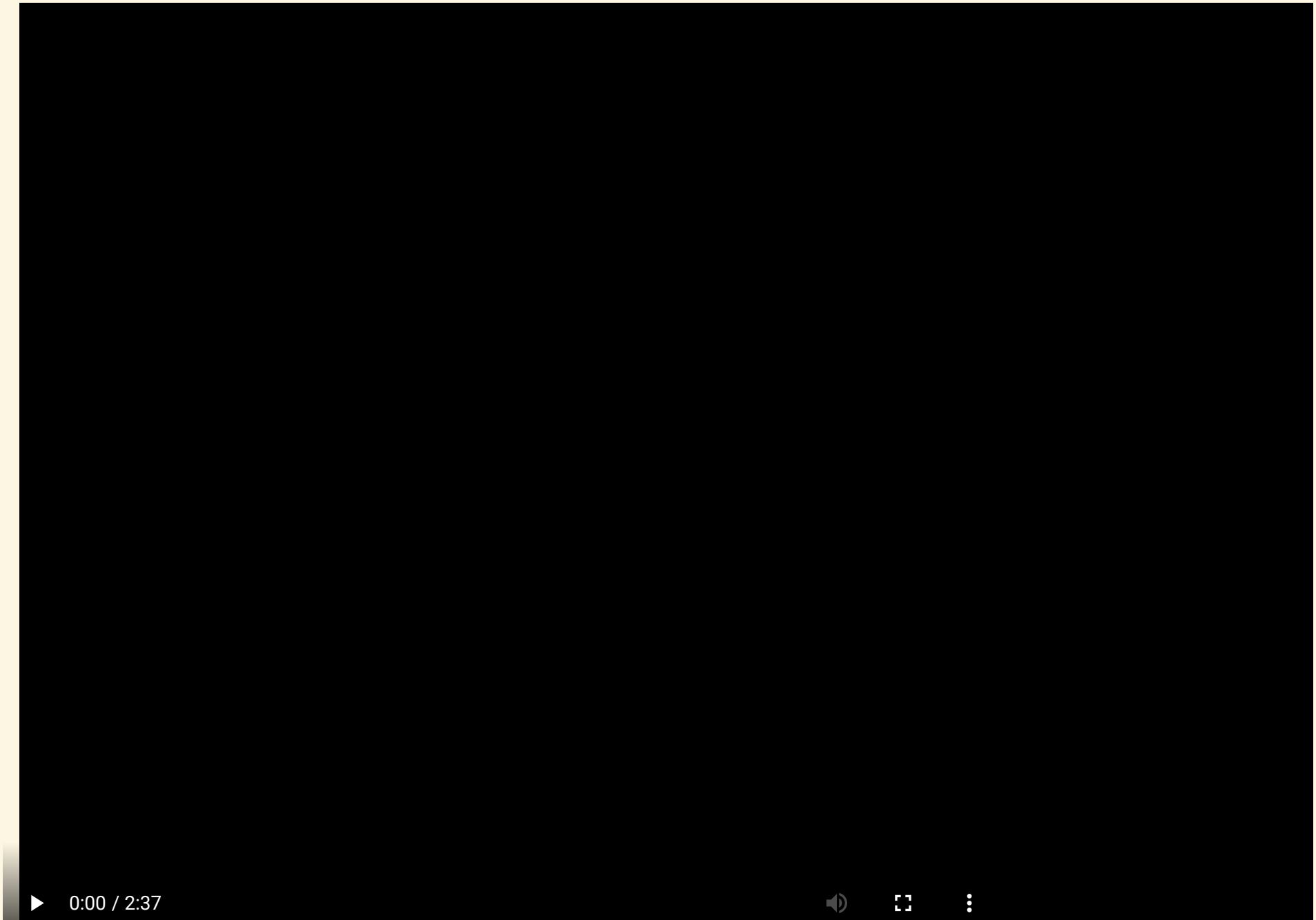
WRITING A TEST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CONCLUSIONS

- CodeceptJS is a meta framework
- CodeceptJS solves real testing problems
- CodeceptJS simplifies end to end testing

QUESTIONS

- **Michael Bodnarchuk @davert**
- CodeceptJS: codecept.io