ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

Unit & Component Tests

Jest, Puppetteer & Storybook

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Outline

- Motivation
- Jest Unit Tests & Component Tests
- Jest Unit Test Lab
- Component Tests with Puppetteer
- Component Tests with Storybook

Motivation Testing

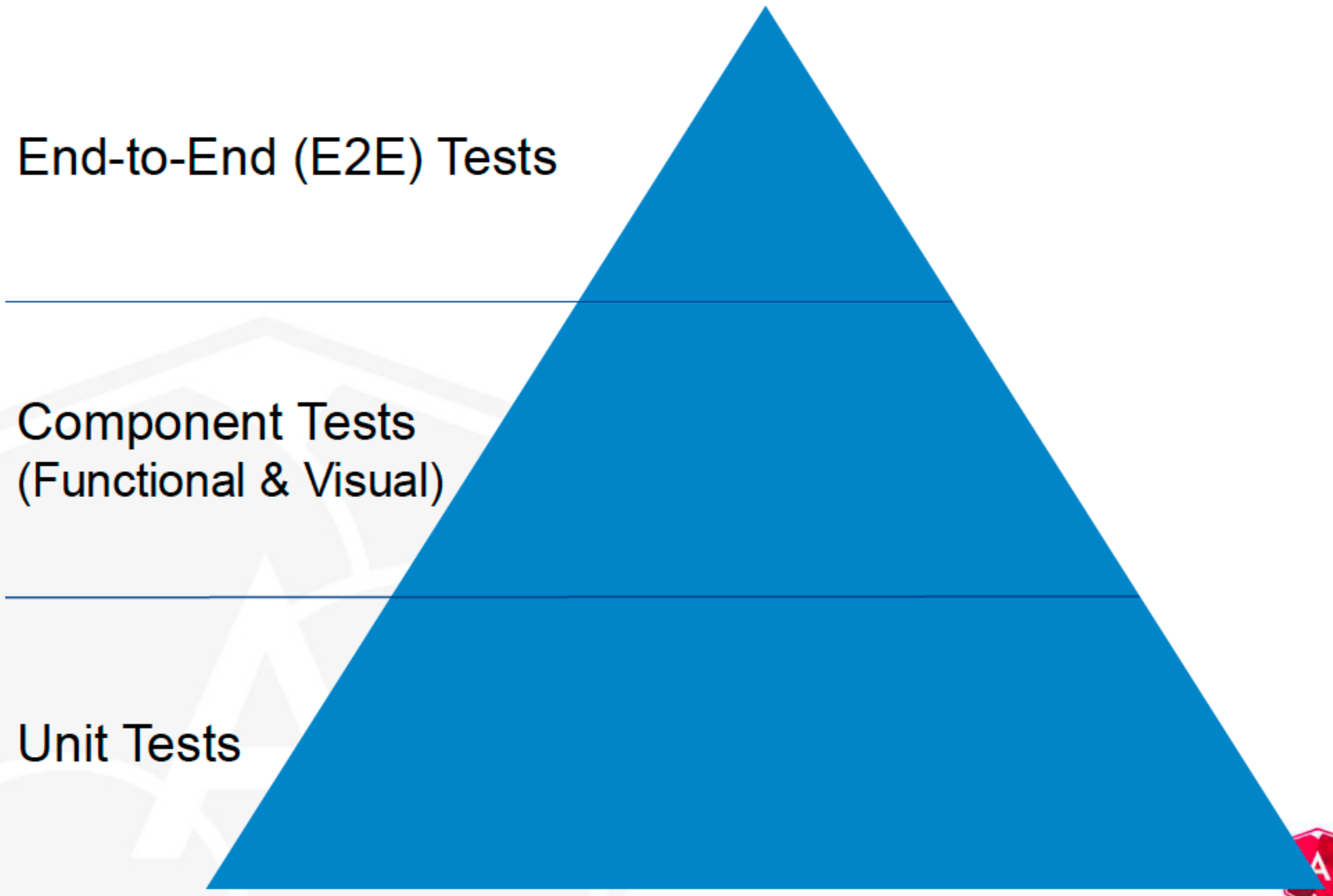
- Prevent bugs
- Enforce code quality
- Tests must be backed by Devs (require discipline)
- Writing Tests needs to be learned
- Tests must run fast, each has its own universe

Unit tests vs. E2E tests

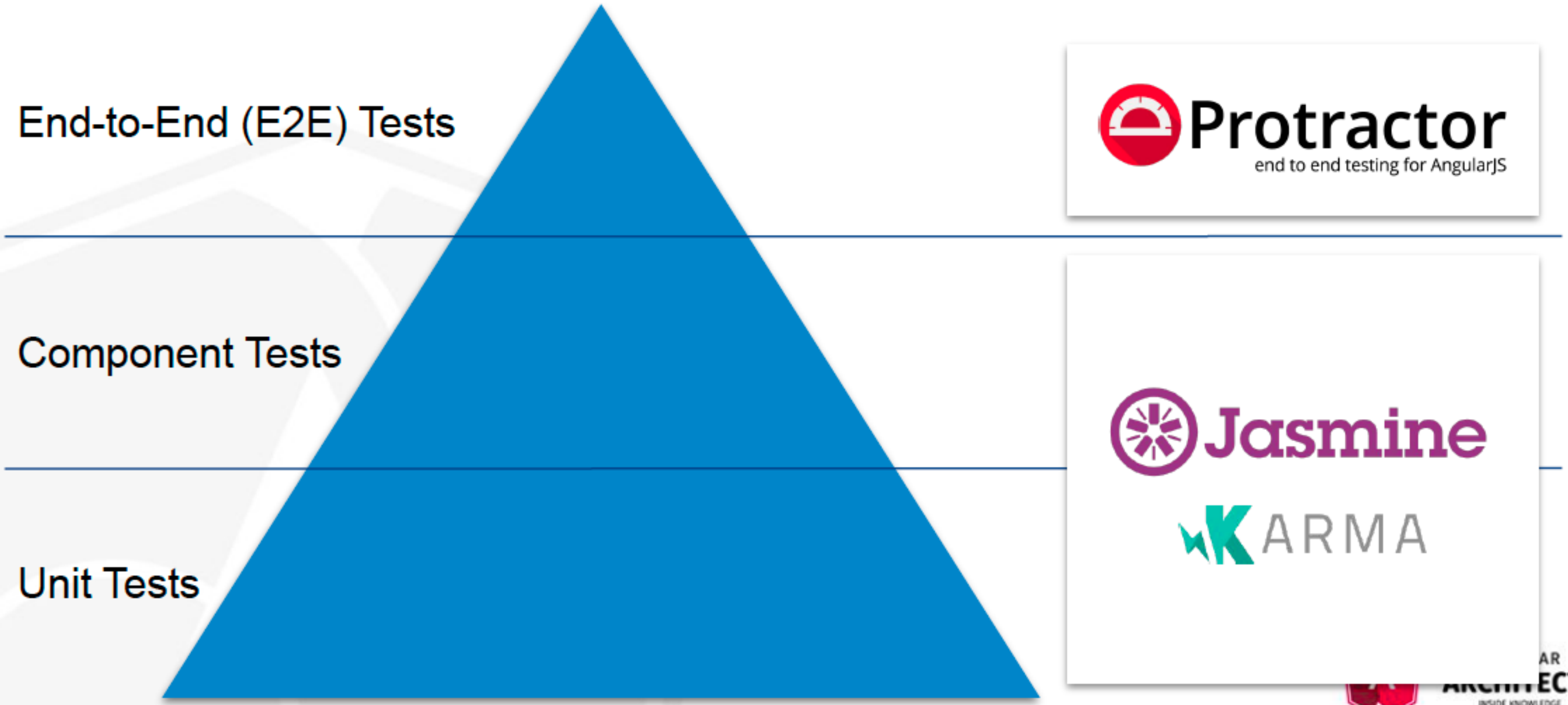
- Unit tests
  - Isolated component tests
  - Should be the majority of the tests
  - Quickly executable

- E2E tests
  - Cross-component tests
  - Simulation of user inputs

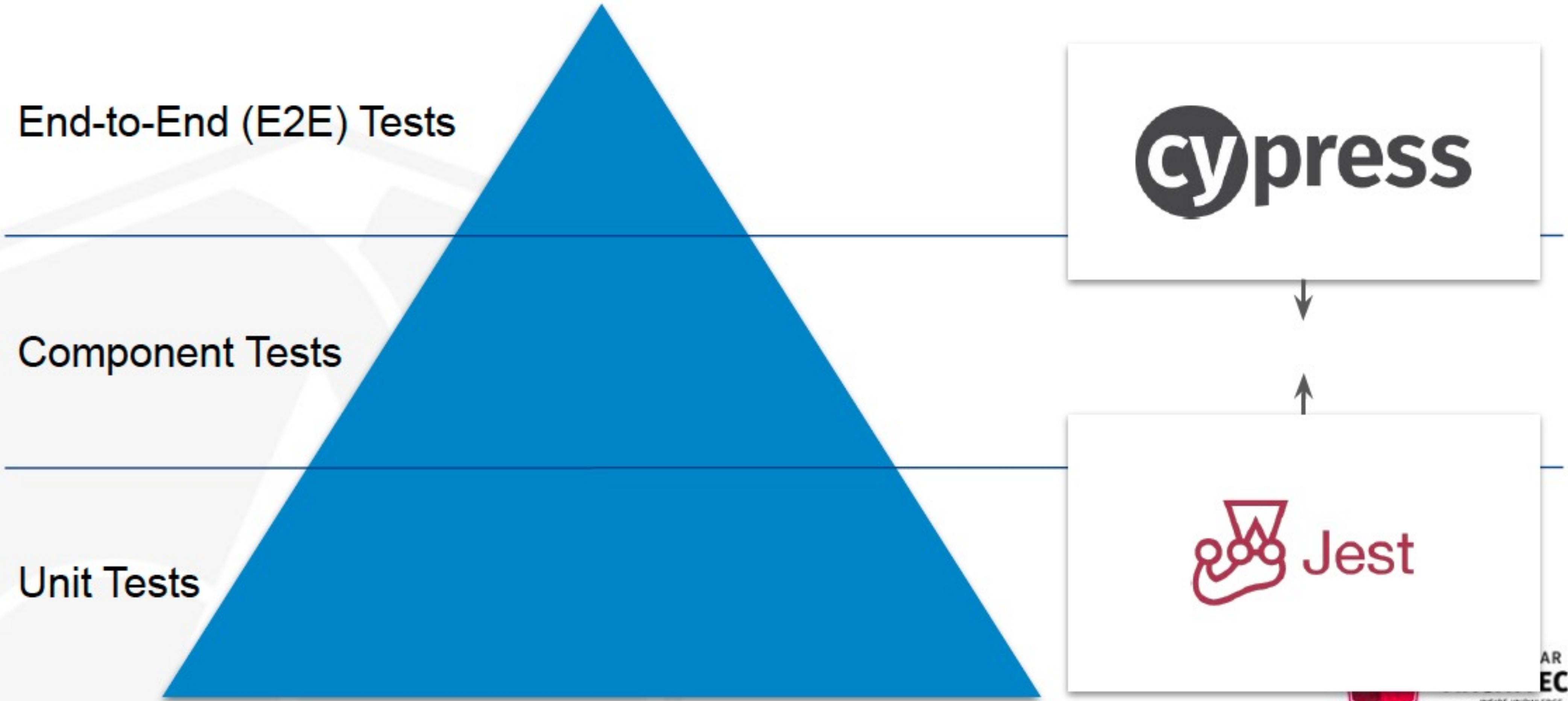
Testing pyramid



Official version (until NG 11)



Our recommendation

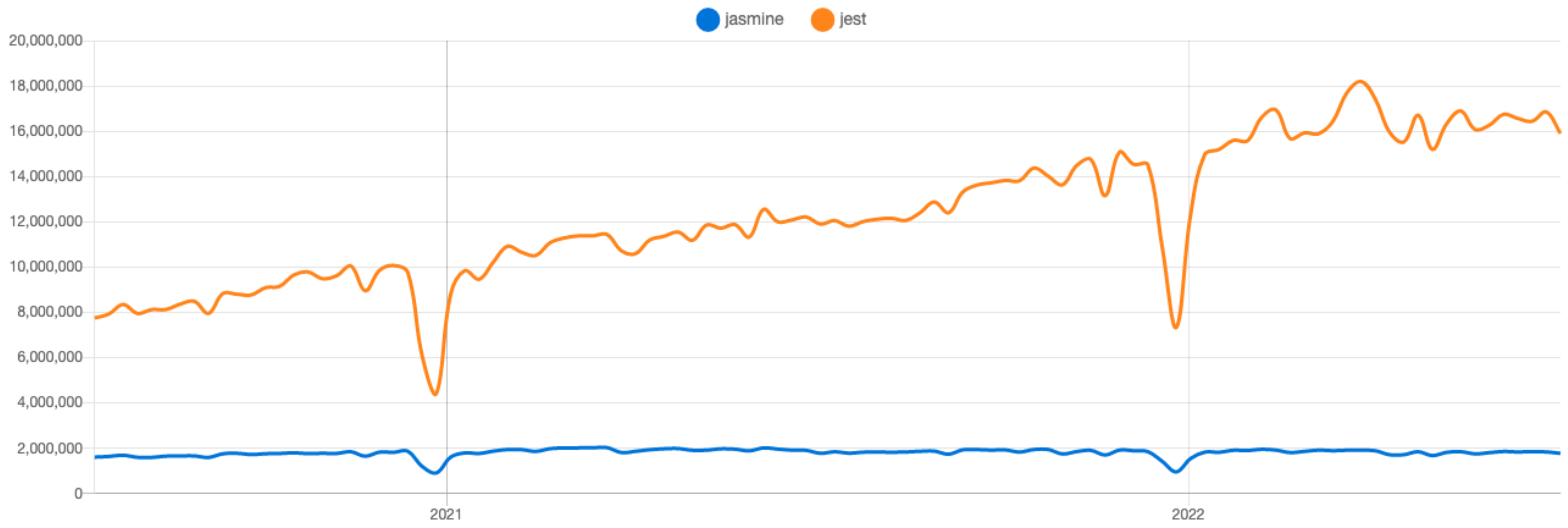


jasmine vs jest

Enter an npm package...

jasmine × jest × + mocha + qunit + ava + chai

Downloads in past 2 Years



Unit Tests

Testdriven development process (ideal world)

- Start with a Test
- Define how you would like to use the functionality
- Make sure it fails
- Implement it
- For next use case, define test

Setup

- Angular CLI
  - ng add @briebug/jest-schematic
  - Remove all karma, jasmine, protractor deps
  - Make sure tsconfig is using jest types
- NX
  - Support out-of-the-box

Motivation

- Superior Code Quality
- Documentation
- Find bugs quickly
- No issues with code coverage

Running Tests

- Running all tests
  - jest or ng test

- Running specific ones
  - jest -t [namePattern]

- Running interactively (Developer Mode)
  - jest --watch

A basic test

```
describe('Initial Tests', () => {
        it('should work', () => {
                expect(true).toBe(true);
        });
});
```

Basic Expects

- expect(true).not.toBe(false);

- expect(true).toBeTruthy();
- expect({}).toBeTruthy();
- expect('').toBeFalsy();

- expect('').toBeDefined();
- expect(null).toBeNull();
- expect(null).toBeDefined();

Data-Type Expects

- string & number
  - expect('hallo').toMatch(/l/);
  - expect(5).toBeGreaterThan(2);
  - expect(0.2 + 0.1).toBeCloseTo(0.3);

- arrays
  - expect([]).toHaveLength(0);
  - expect([1, 2, 3]).toContain(1);

- types
  - expect(new Date()).toBeInstanceOf(Date);
  - expect(new A()).toBeInstanceOf(A);
  - expect(() => true).toBeInstanceOf(Function);

Object Expects

```
const address = {
        street: 'Domgasse’,
        streetNumber: '5’,
        zip: '1010’,
        city: 'Vienna’
};
const clone = { ...address };
```

- expect(address).toBe(clone); // fails
- expect(address).toEqual(clone); // succeeds
- expect(address).toMatchObject({ street: 'Domgasse', city: 'Vienna' }); // succeeds
- expect(address).toMatchObject({ city: expect.stringMatching(/Vienna|Wien/) }); // succeeds

Expect Exceptions

```
const fn = () => {
        throw new Error('nothing works');
};
```

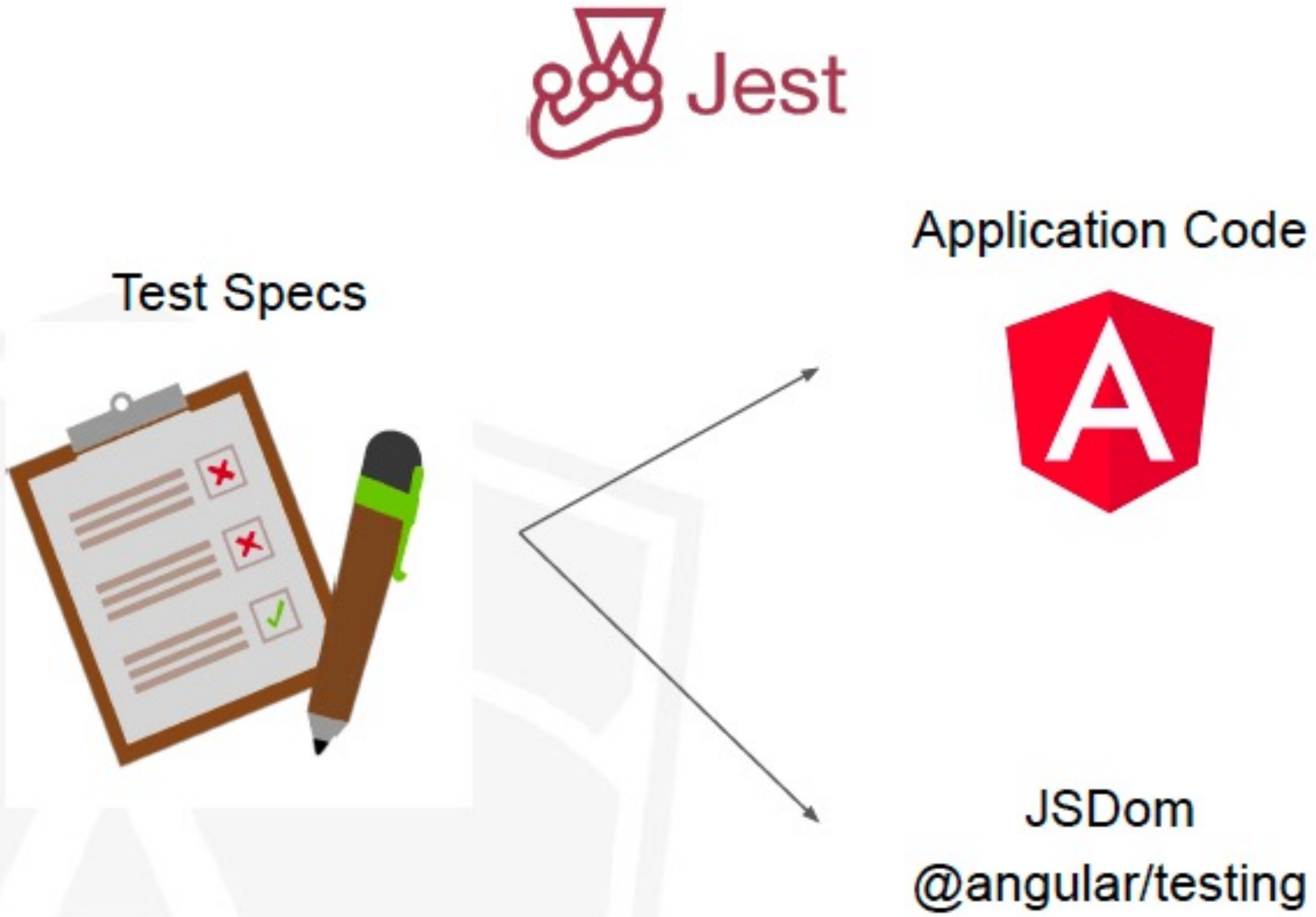
- expect(fn).toThrowError();
- expect(fn).toThrowError('nothing works');

Unit tests with Jest – Demo

Ready for the lab!

- What are your questions?

Component Tests


Jest
Test Specs
Application Code
JSDom
@angular/testing

Component Tests powered by Angular

- TestBed
  - Configures & initializes environment for unit testing
  - Provides methods for creating components and services in unit tests.

- TestModule

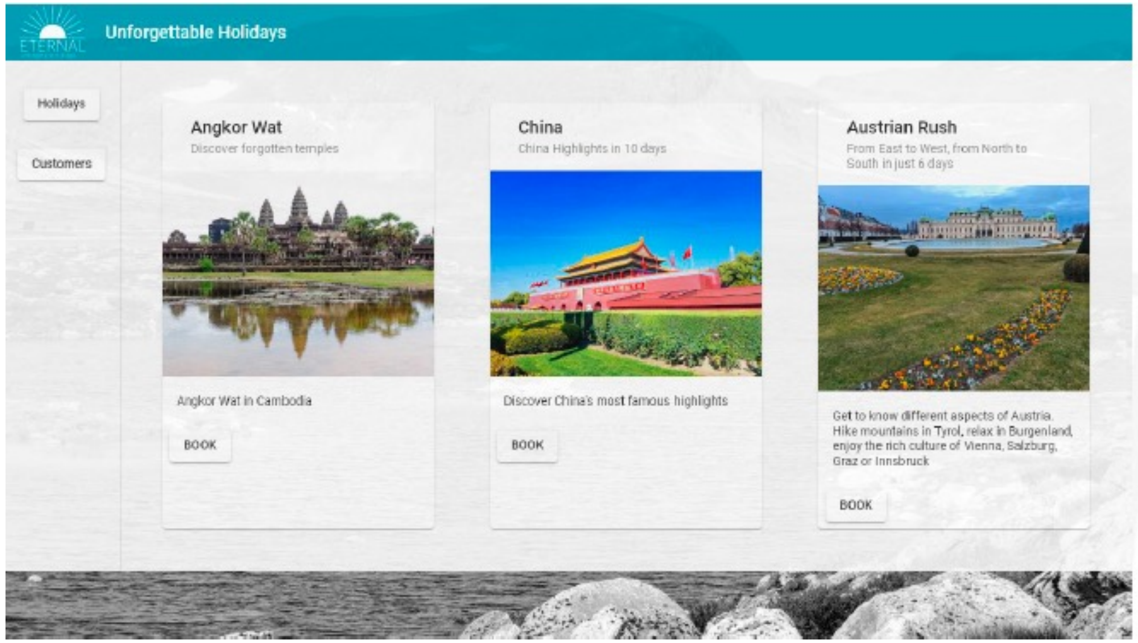
```
const fixture = TestBed.configureTestingModule({
        declarations: [AddressComponent],
        imports: [ReactiveFormsModule],
        providers: [{ provide: AddressLookuper, useValue: null }]
}).createComponent(AddressComponent);

const component = fixture.componentInstance;
```

Component Tests - Puppetteer

Component Tests - Puppetteer I

- Puppetteer
  - Headless Browser
  - Spot the difference


Unforgettable Holidays

Holidays

Customers

Angkor Wat

Discover forgotten temples

Angkor Wat in Cambodia

BOOK

China

China Highlights in 10 days

Discover China's most famous highlights

BOOK

Austrian Rush

From East to West, from North to South in just 6 days

Get to know different aspects of Austria. Hike mountains in Tyrol, relax in Burgenland, enjoy the rich culture of Vienna, Salzburg, Graz or Innsbruck

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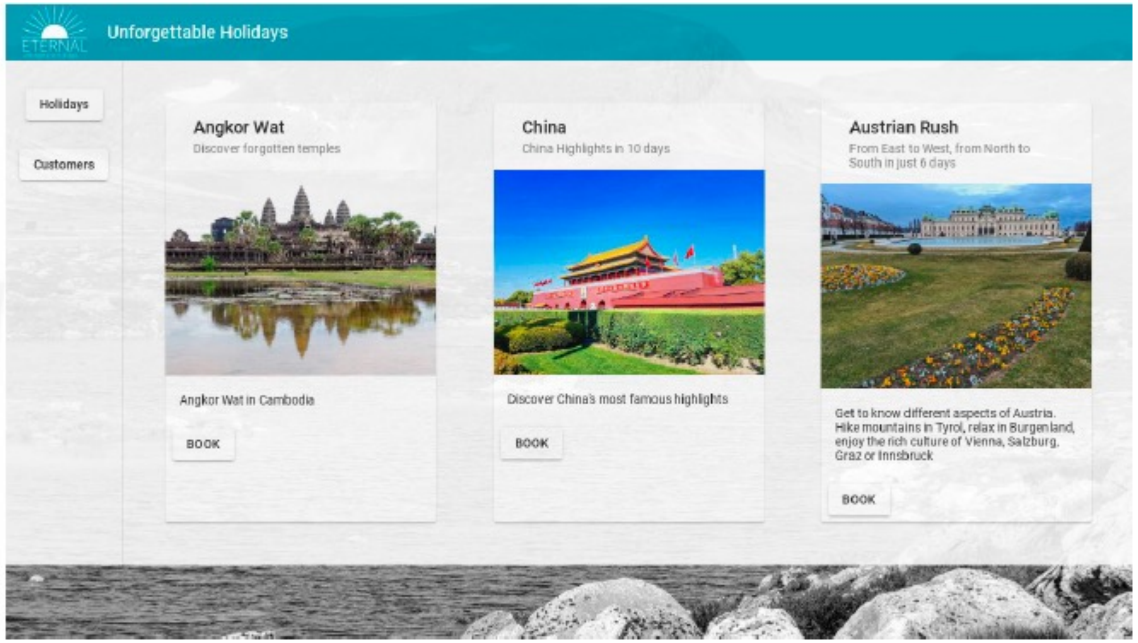
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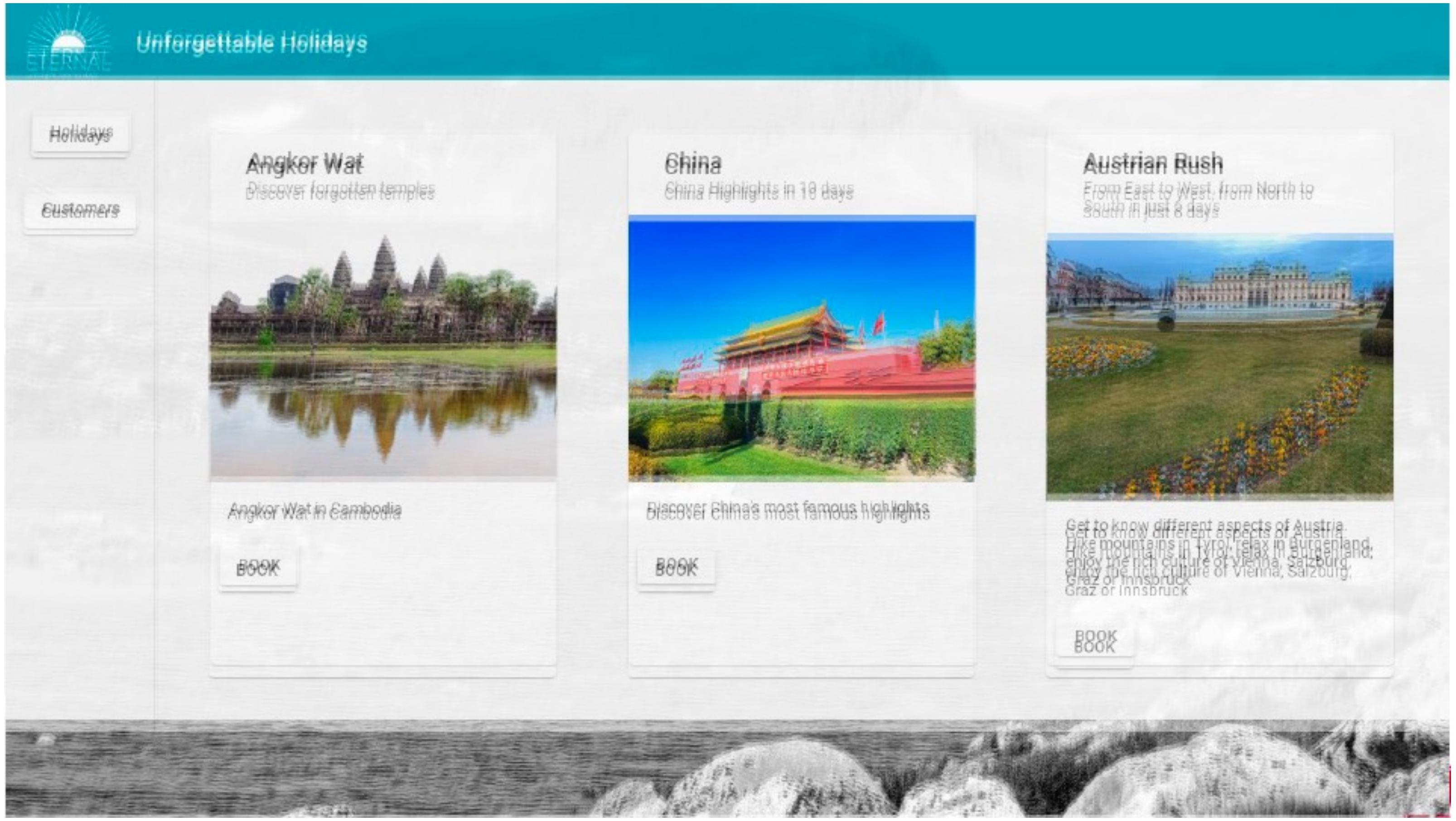
Component Tests - Puppetteer II



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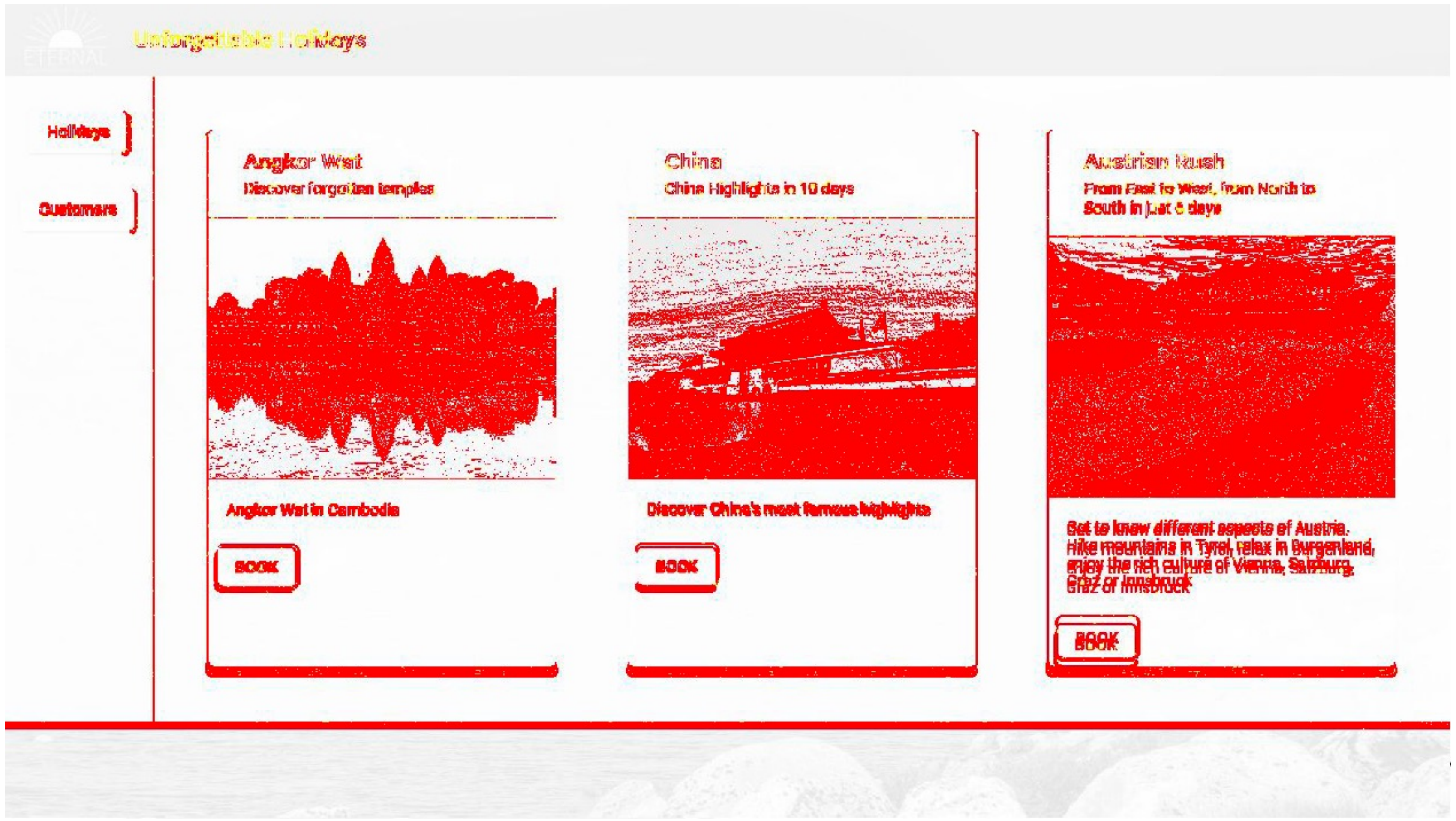
Component Tests - Puppetteer III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Component Tests - Storybook

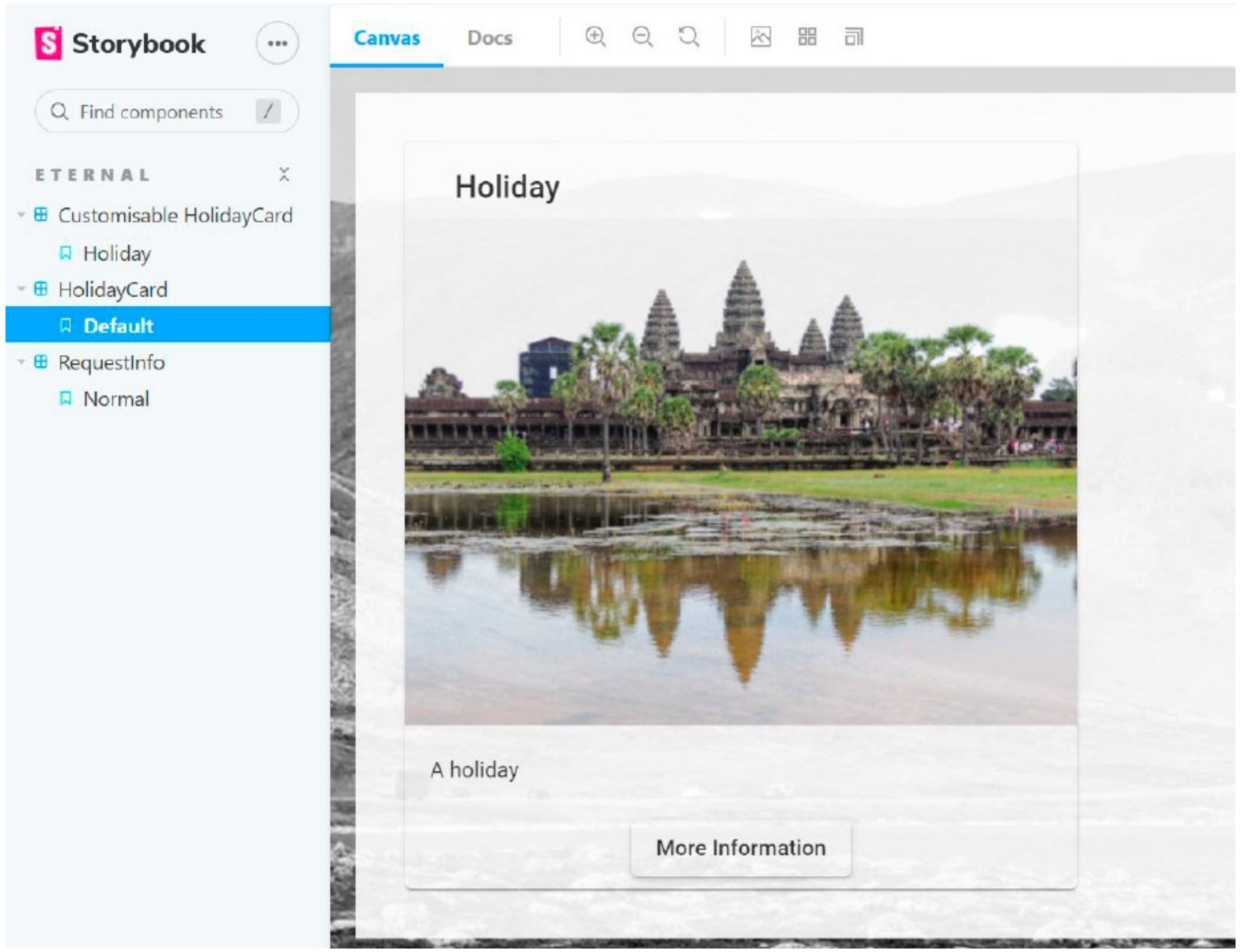
Component Tests – Storybook I

- Allows to isolate Components
- Not Angular Specific
- Configure a Component for various states
- Can also used for visual widget library (not just testing)

Component Tests – Storybook II

- Easy to setup in Storybook
- Decoupled from business logic
- No Dependency Injection
- If possible only primitive types as @Input

Component Tests – Storybook III



Storybook – Get Started

- npx sb init
- will auto generate examples
- yarn storybook

Storybook – Conclusion

- most popular tool for UI component development & documentation
- used by GitHub, Airbnb, and Stripe
- but it has issues with not using default webpack

That’s it for unit & component testing!

- What are your questions?