Angular testing

GFT INTERNAL TRAINING
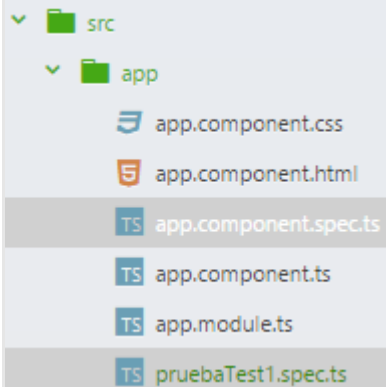
INNOVATE. TRANSFORM. DELIVER.

Agenda

1. **simple test tryout**

2. **testing components**

3. **testing services**

4. **testing coverage**

5. **end to end testing**

6. **testing tools**

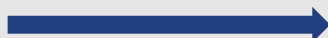7. **learning resources**

simple test tryout

- src
  - app
    - app.component.css
    - app.component.html
    - app.component.spec.ts
    - app.component.ts
    - app.module.ts
    - pruebaTest1.spec.ts

```
describe('Test de Prueba 1', () => {
  it('true is true', () => expect(true).toBe(true));
});
```

npm test

Karma v4.1.0 - conne

Chrome 78.0.3904 (Windows 10.0.0) is

⊛Jasmine   3.4.0

• • • •

4 specs, 0 failures, randomized

Test de prueba 1
  • true is true

AppComponent
  • should have as title 'testing-app'
  • should create the app
  • should render title

```
active ...PruebaTest\src\app\pruebaTest1.spe
Executed 1 of 4 SUCCESS (0 secs / 0.149 s
Executed 2 of 4 SUCCESS (0 secs / 0.187 s
Executed 3 of 4 SUCCESS (0 secs / 0.228 s
Executed 4 of 4 SUCCESS (0 secs / 0.228 s
Executed 4 of 4 SUCCESS (0.236 secs / 0.2
```

testing components

beforeEach()

```
describe('AppComponent', () => {
  beforeEach(async(() => {
    TestBed.configureTestingModule({
      imports: [
        RouterTestingModule
      ],
      declarations: [
        AppComponent
      ],
    }).compileComponents();
  }));
```

runs the setup (beforeEach) function within a special async test zone

https://angular.io/api/core/testing/async

TestBed.configureTestingModule

```
beforeEach(async(() => {
  TestBed.configureTestingModule({
    declarations: [
      AppComponent
    ],
  }).compileComponents();
}));
```

produce the module environment for the class you want to test

https://angular.io/guide/testing#testbed

TestBed.createComponent

returns a **ComponentFixture**, a handle on the test environment surrounding the created component

```
it('should create the app', () => {
  const fixture = TestBed.createComponent(AppComponent);
  const app = fixture.debugElement.componentInstance;
  expect(app).toBeTruthy();
});
```

https://angular.io/guide/testing#component-fixture

reference to the instance of the component

```
it('should create the app', () => {
  const fixture = TestBed.createComponent(AppComponent);
  const app = fixture.debugElement.componentInstance;
  expect(app).toBeTruthy();
});
```

```
it(`should have as title 'testing-app'`, () => {
  const fixture = TestBed.createComponent(AppComponent);
  const app = fixture.debugElement.componentInstance;
  expect(app.title).toEqual('testing-app');
});
```

accesing the DOM

```
it('should render title', () => {
  const fixture = TestBed.createComponent(AppComponent);
  fixture.detectChanges();
  const compiled = fixture.debugElement.nativeElement;
  expect(compiled.querySelector('.content span').textContent).toContain('testing-app app is running!');
});
});
```

- Once the component is created, we call to its **detectChanges** method, in order to reflect to the DOM, the possible changes that can may occurred (due to, for instance, an AJAX call)

- we can use DOM API methods such as **querySelector** to access the nodes and verify its content

learn by doing

- modify app component

```
export class AppComponent {
  title = 'app';
  motto = 'GFT rules!!'
}
```

```
<!--The whole content below can be removed with the new code.-->
<div style="text-align:center">
  <h1>
    Welcome to {{title}}!!
  </h1>
  <p>{{motto}}</p>
  <p>Just a paragraph</p>
```

learn by doing (refactor app.component.spec.ts)

```typescript
it('should create the app', () => {
  expect(fixture.componentInstance).toBeTruthy();
});
it(`should have as title 'testing-app'`, () => {
  expect(fixture.componentInstance.title).toEqual('testing-app');
});
it('should render title', () => {
  fixture.detectChanges();
  expect(fixture.nativeElement.querySelector('.content span')
          .textContent).toContain('testing-app app is running!');
});
```

learn by doing

▪do this testing

```
AppComponent
    should create the app
    should have as title 'app'
    should have as motto 'GFT rules!!'
    should render motto in a p tag
    should render two <p>
```

testing services

testing services

```
import { TestBed } from '@angular/core/testing';
import { DiceService } from './dice.service';

describe('DiceService', () => {
  beforeEach(() => TestBed.configureTestingModule({}));

  it('should be created', () => {
    const service: DiceService = TestBed.get(DiceService);
    expect(service).toBeTruthy();
  });
});
```

learn by doing

■ test the DiceService

```
import { Injectable } from '@angular/core';

@Injectable()
export class DiceService {

  constructor() { }

  throwDice(){
    return Math.floor(6*Math.random()+1);
  }

}
```
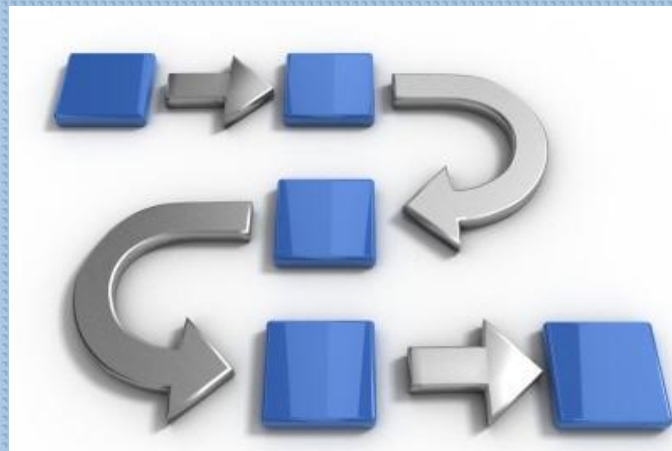
Testing coverage

```
ng test --watch=false --code-coverage
```

```
=============================== Coverage summary =
Statements    : 100% ( 8/8 )
Branches      : 100% ( 0/0 )
Functions     : 100% ( 2/2 )
Lines         : 100% ( 6/6 )
```
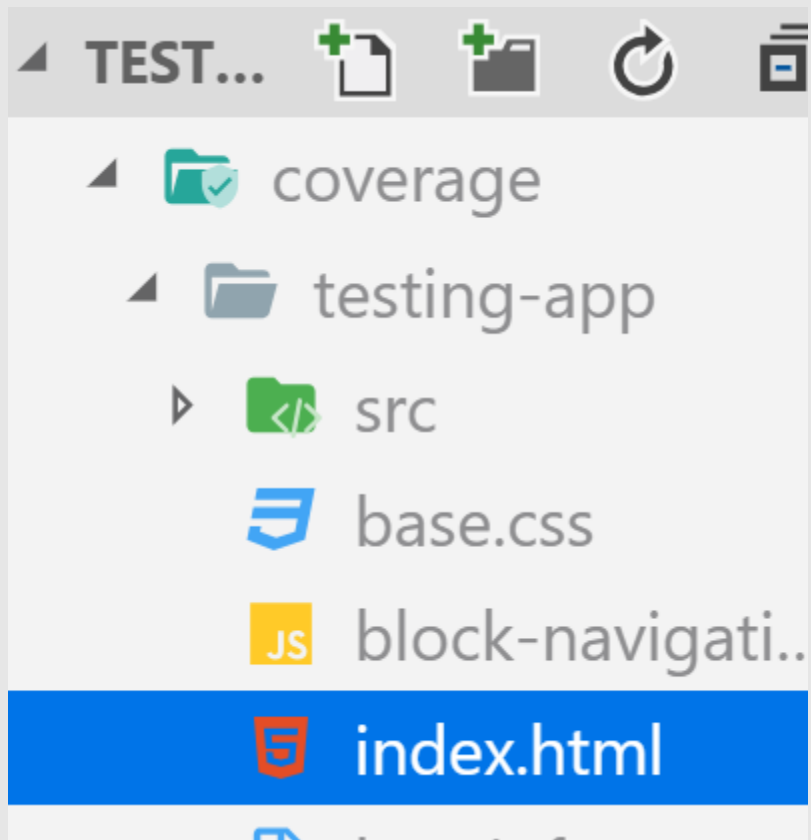
End to End testing

learn by doing

```
ng e2e
```

```
workspace-project App
    √ should display welcome message

Executed 1 of 1 spec SUCCESS in 1 sec.
```

learn by doing (resolved) 1/2
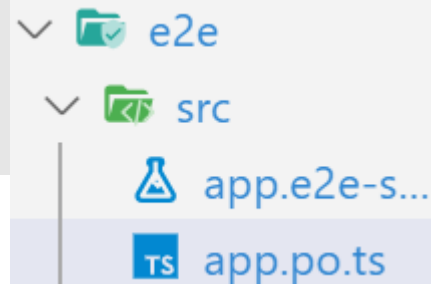
e2e

src

△ app.e2e-spec.ts

```
it('should display welcome message', () => {
  page.navigateTo();
  expect(page.getTitleText()).toEqual('Welcome to app');
});
```

learn by doing (resolved) 2/2

e2e
src
app.e2e-s...
app.po.ts

```typescript
import { browser, by, element } from 'protractor';

export class AppPage {
  navigateTo() {
    return browser.get(browser.baseUrl) as Promise<any>;
  }


  getTitleText() {
    return element(by.css('h1')).getText() as Promise<string>;
  }
}
```

Testing tools

Test tooling landscape (as of 2019 angular8)

Bundled in angular by default	https://karma-runner.github.io/	https://jasmine.github.io/	https://www.protractortest.org
strong alternatives	https://jestjs.io		https://www.cypress.io

https://techblog.fexcofts.com/2018/09/24/end-to-end-e2e-angular-testing-protractor-vs-cypress/

learning resources

Video
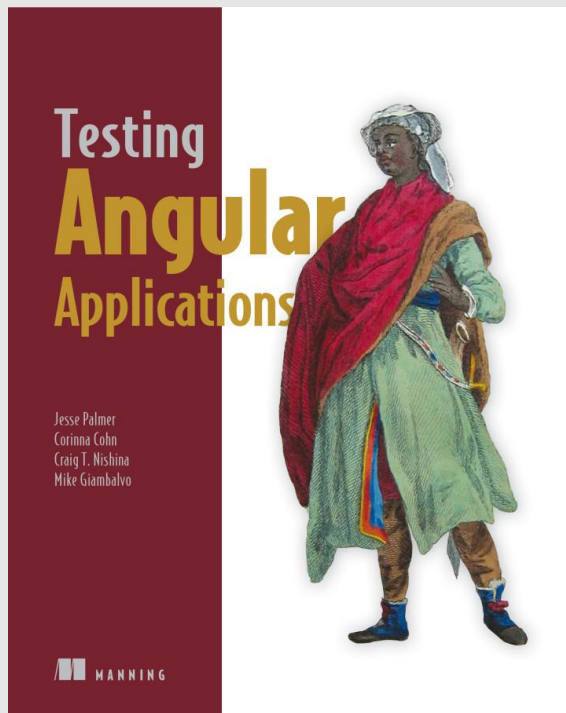

Protractor: A New Hope - Michael Giambalvo, Craig Nishina

https://www.youtube.com/watch?v=6aPfHrSl0Qk&t=0s&index=23&list=PLqn52Dxq8AiVUHmj53FjZnku8iaypiYeR

Book

https://www.manning.com/books/testing-angular-applications

Shaping the future of digital business

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