Testing mit Angular

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Inhalt

- Überblick zu Jasmine
- Jasmine und Angular
- DEMO

Warum automatisierte Tests?

- Verhindern von Regression
- Prüfen, ob Anforderungen erfüllt wurden
- Test-First als Design-Strategy

Überblick zu Jasmine

Anatomie eines Jasmine-Tests

```
describe("Object under test", function () {

    beforeEach(function () { … });
    afterEach(function () { … });

    it("should do this", function () {
        let r = add(1, 2);
        expect(r).toBe(3);
    });

    it("should do that", function () {
        let r = add(1, 11);
        expect(r).toBe(12);
    });

});
```

Karma

- Testrunner für Unit-Tests
- Kommandozeile (und somit CI)
- Startet Browser
- Erzeugt Protokolle (z. B. im JUnit-Format)

Ausführen

- npm test
- ng test
- via WebStorm/ IntelliJ

Jasmine und Angular

TestBed

```
beforeEach(async(() => {

    TestBed.configureTestingModule({
        imports: [HttpClientModule, …],
        declarations: […],
    })
    .compileComponents();

}));
```

Unit-Test

```
it('should have no selected flight initially', () => {

    let flightSearchFixture =
            TestBed.createComponent(FlightSearchComponent);

    […]

});
```

Unit-Test

```
it('should have no selected flight initially', () => {

    let flightSearchFixture =
            TestBed.createComponent(FlightSearchComponent);

    let flightSearchComponent =
            flightSearchFixture.componentInstance;

    expect(flightSearchComponent.selectedFlight)
                                .toBeUndefined();
});
```

Asynchrone Tests

```
it('should load flights’, waitForAsync(() => {

    […]

}));
```

Asynchrone Tests (Alternative)

```
it('should load flights', (done: Function) => {

    […]
    done();

});
```

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HttpClientTestingModule

```
beforeEach(async(() => {

    TestBed.configureTestingModule({
       imports:[FormsModule, HttpClientTestingModule],
       declarations: [ FlightSearchComponent ]
    })
    .compileComponents();

}));
```

HttpTestingController

```
it('...', () => {
    component.from = 'Graz';
    component.to = 'Hamburg';
    component.search();

    […]
});
```

HttpTestingController

```
it('...', () => {
    component.from = 'Graz';
    component.to = 'Hamburg';
    component.search();

    let httpTestingController: HttpTestingController =
                                    TestBed.get(HttpTestingController);



    […]
});
```

HttpTestingController

```
it('...', () => {
    component.from = 'Graz';
    component.to = 'Hamburg';
    component.search();

    let httpTestingController: HttpTestingController =
                                    TestBed.get(HttpTestingController);

    const req = httpTestingController.expectOne('http://www.angular.at/…');

    […]
});
```

HttpTestingController

```
it('...', () => {
    component.from = 'Graz';
    component.to = 'Hamburg';
    component.search();

    let httpTestingController: HttpTestingController =
                                    TestBed.get(HttpTestingController);

    const req = httpTestingController.expectOne('http://www.angular.at/…');

    req.flush([{ id: 22, from: 'Graz', to: 'Hamburg', date: ''}]);

    […]
});
```

HttpTestingController

```
it('...', () => {
    component.from = 'Graz';
    component.to = 'Hamburg';
    component.search();

    let httpTestingController: HttpTestingController =
                                    TestBed.get(HttpTestingController);

    const req = httpTestingController.expectOne('http://www.angular.at/…');

    req.flush([{ id: 22, from: 'Graz', to: 'Hamburg', date: ''}]);

    expect(component.flights.length).toBe(1);
});
```

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Globale Provider überschreiben

```
beforeEach(async(() => {

    TestBed.configureTestingModule({
        imports: [HttpModule, …],
        declarations: [],
        providers: [
            { provide: FlightService, useClass: FlightServiceMock },
            { provide: BASE_URL, useValue: ''}
        ]
    }).compileComponents();

}));
```

Provider für Komponente überschreiben

```
[…]
TestBed.overrideComponent(FlightSearchComponent, {
                set: {
                    providers: [{
                            provide: FlightService,
                            useClass: FlightServiceMock
                    }]
                }
        })
        .compileComponents();
[…]
```

DEMO

LAB

E2E-Testing mit Protractor

Protractor

- E2E-Test-Framework für AngularJS
- Interagiert mit Browser
- Simuliert Benutzereingaben
- Unterstützt Jasmine

Erste Schritte

```
describe("FlugApp", function() {

   beforeEach(function() {
      browser.get('http://localhost:8080/');
   });

   it('should load page and read title', function() {

         var expectedTitle = 'FlugApp';
         expect(browser.getTitle()).toBe(expectedTitle);

   });
});
```


Protractor löst Promises automatisch auf

Weiteres Beispiel

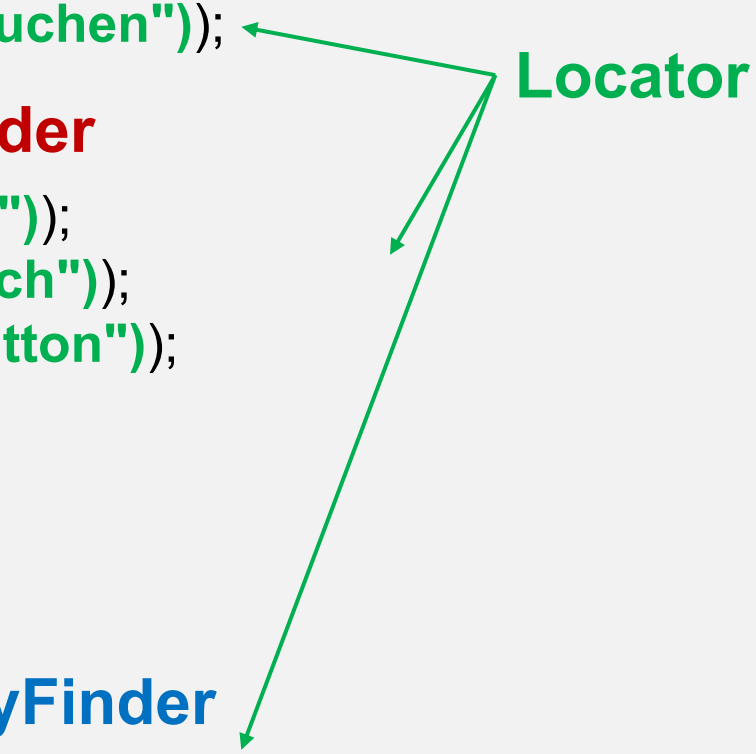
```
var link = element(by.linkText("Buchen"));
link.click();

var von = element(by.name("von"));
var nach = element(by.name("nach"));
var suchen = element(by.css("button"));

von.clear(); nach.clear();
von.sendKeys("Graz");
nach.sendKeys("Hamburg");
suchen.click();

var fluege = element.all(by.tagName("tr"));

expect(fluege.count()).toBe(4);
```



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