aarixa

> ict and business optimization

Angular Fundamentals
Module 1 - Inleiding

Peter Kassenaar
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Hoe ziet een opleiding er uit?

Symptomen? Blijf thuis!

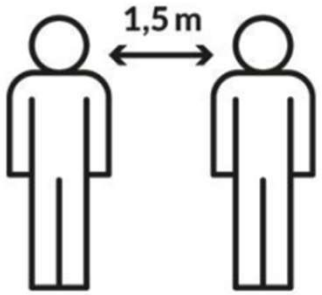
Heb je symptomen die mogelijk duiden op CoViD-19, blijf zeker thuis. Indien je op de opleiding verschijnt met symptomen, word je naar huis gestuurd.

Mondmaskers verplicht

Het gebruik van mondmaskers is **verplicht**. Enkel waar voldoende afstand gegarandeerd kan worden, is het dragen van een mondmasker optioneel. Neem deze dus zeker mee naar de opleiding.

Handhygiëne

Voor de les begint en voor de lunchpauze ben je verplicht om je handen te wassen. Er is voldoende water en zeep en/of handgel beschikbaar.



Afstand

Elke opleiding vindt plaats in een locatie die ruim genoeg is om voldoende fysieke afstand te kunnen houden. Hou altijd minstens **1,5 meter afstand**.

Blijf van je gezicht

Raak je gezicht niet aan en vermijd elk fysiek contact.

Volg de instructies

De lesgever informeert je over de **te volgen richtlijnen**. Luister altijd naar zijn/haar instructies. Deze dienen om jouw veiligheid en die van de lesgever te garanderen.

Materiaal

Al het materiaal dat je gebruikt is op voorhand **gereinigd** en wordt ook na elke les opnieuw gereinigd. Tijdens praktijklessen moet je steeds met (eigen) handschoenen werken.

Reiniging lokalen

Na elke les worden lestafels, stoelen, klinken en eventueel lesmateriaal opnieuw gereinigd.

Peter Kassenaar

- Trainer, author, developer – since 1996
- Specialty: *"Everything JavaScript"*
- JavaScript, ES6, Angular, NodeJS, TypeScript, React, Vue, Phonegap

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VANDUUREN MEDIA

Twitter: @PeterKassenaar

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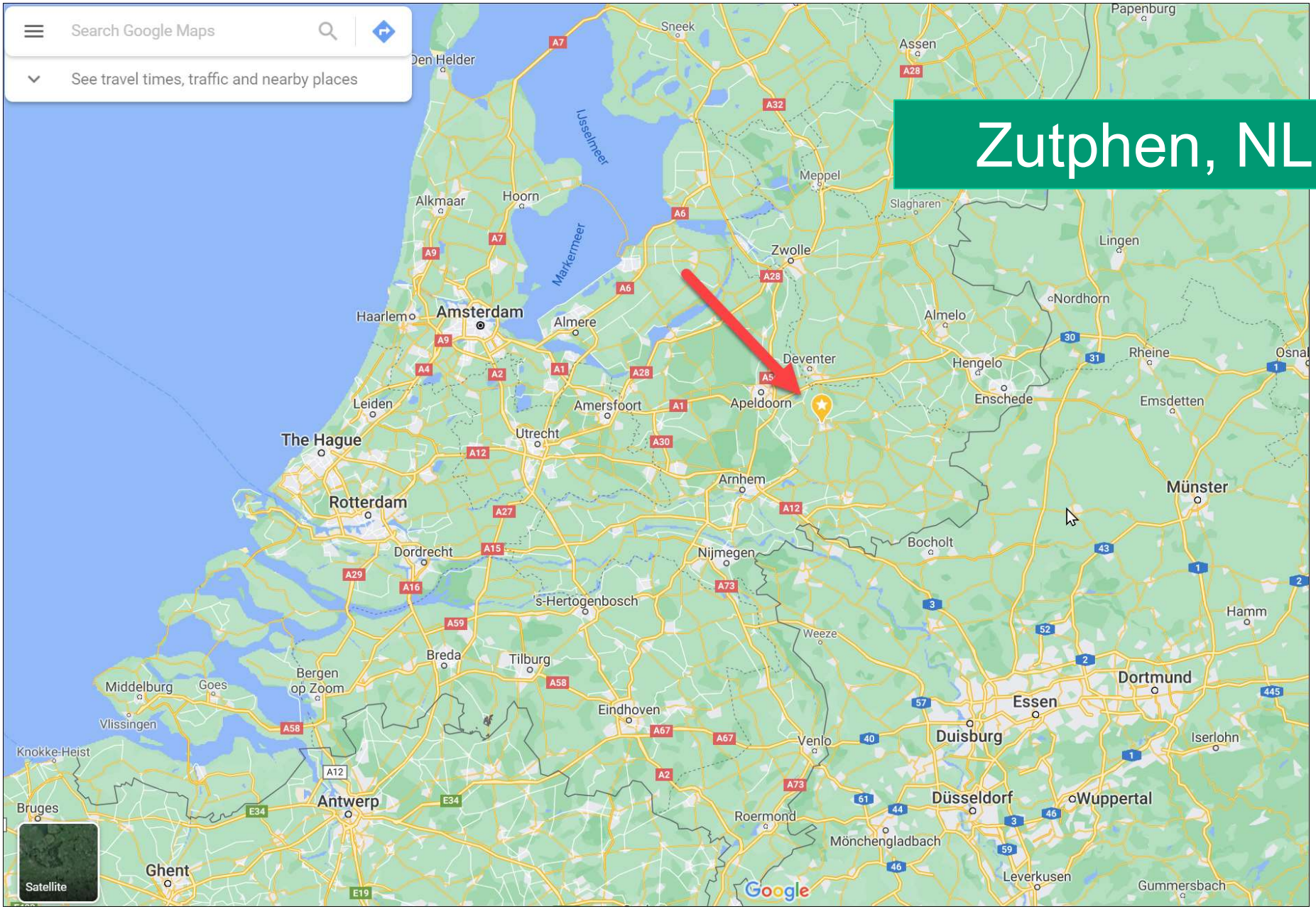
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See travel times, traffic and nearby places
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Amsterdam
Rotterdam
The Hague
Utrecht
Arnhem
Nijmegen
Apeldoorn
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Zwolle
Amersfoort
Eindhoven
Tilburg
Breda
Antwerp
Ghent
Bruges
Dortmund
Essen
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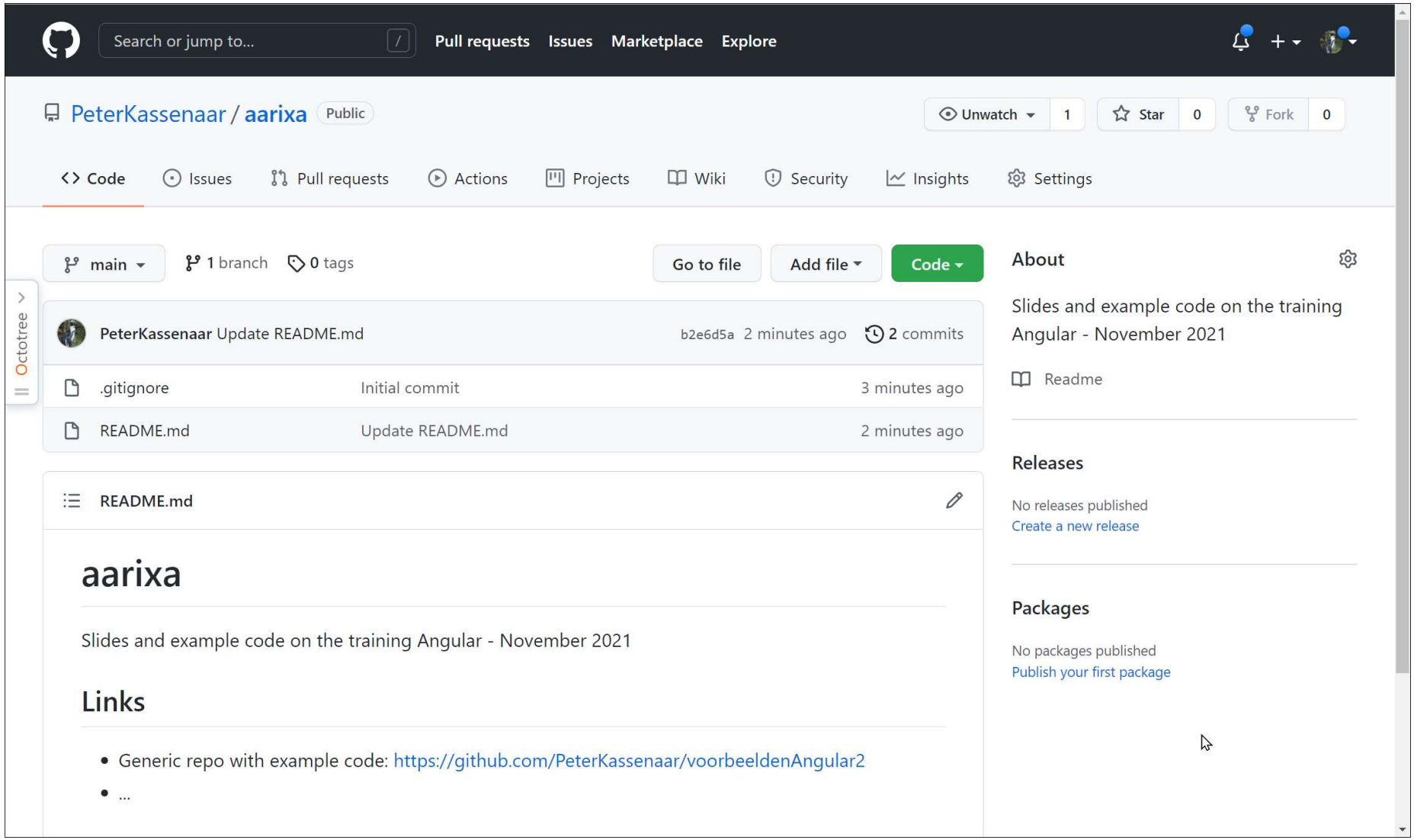
www.angulartraining.nl

github.com/PeterKassenaar/aarixa



Over jullie

Stel jezelf kort voor

Voorkennis webdevelopment, (mobile/web-) apps?

(Kennis AngularJS 1.x?)

Voorkennis andere (web)talen?

Verwachtingen van de cursus?

Concrete projecten?

Specifieke vragen of technieken die je wilt behandelen?

Agenda - globaal

22 – 24 november 2021 – ma – wo

17 – 18 januari 2022 –*Advanced Topics*

~9:00 start

~ 10:30 Break

~12:00 lunch

~ 14:30 Break

~16:00-16:15 Einde

Woensdag – mogelijk iets eerder stoppen

Doel van de training

*Je wordt **geen** Angular wizard in 3 dagen (sorry)*

maar….

Goals

1. Je leert over de structuur en architectuur van Angular Apps. Van een kleine `hello-world` app tot een grote Enterprise applicatie.

2. Je bent bekend met de belangrijkste Angular concepten van het framework. Specifieke details kun je altijd Googelen.

3. Je hebt enige hands-on ervaring met het maken van apps en componenten, services, API's/backends, component communicatie.

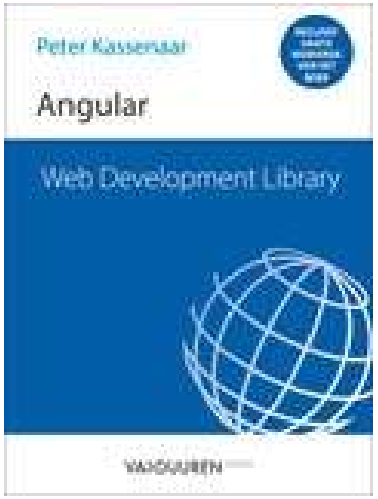
4. Je hebt een algemeen begrip van de manier waarop moderne web apps worden gemaakt met Angular, TypeScript en build tools.

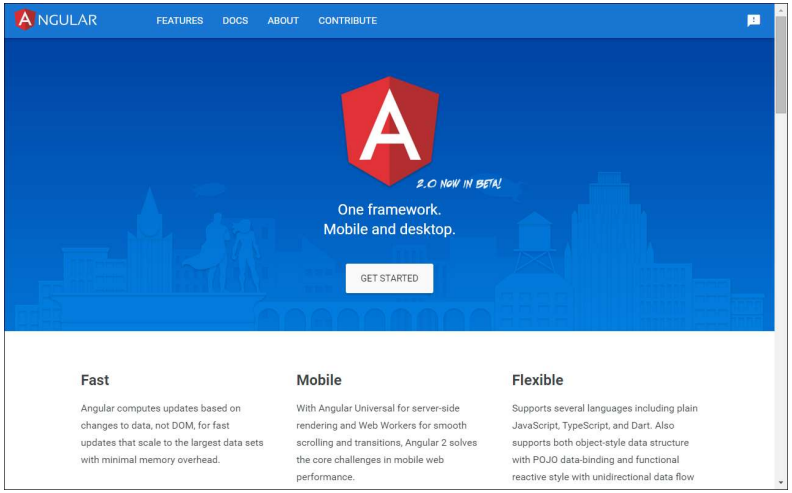
Agenda - 3 dagen

- Introductie & geschiedenis - waarom Angular?
- Kernbegrippen in Angular 2 – 10
- CLI, Hello World in Angular – inzicht in boilerplate-code
- Angular in depth (modules):
  - Components
  - ECMAScript 2015 + TypeScript
  - Data binding
  - Dependency Injection (DI) – more components
  - Services en http, Observables (RxJS), communicatie backend
  - Intercomponent communication
- BEST PRACTICES / STYLE GUIDE

Materialen

Software	(Angular, NodeJS + NPM, editor, browser)
Handouts	(Github - PDF)
Oefeningen	(Github)
Websites	(online)





angular.io/

Vandaag

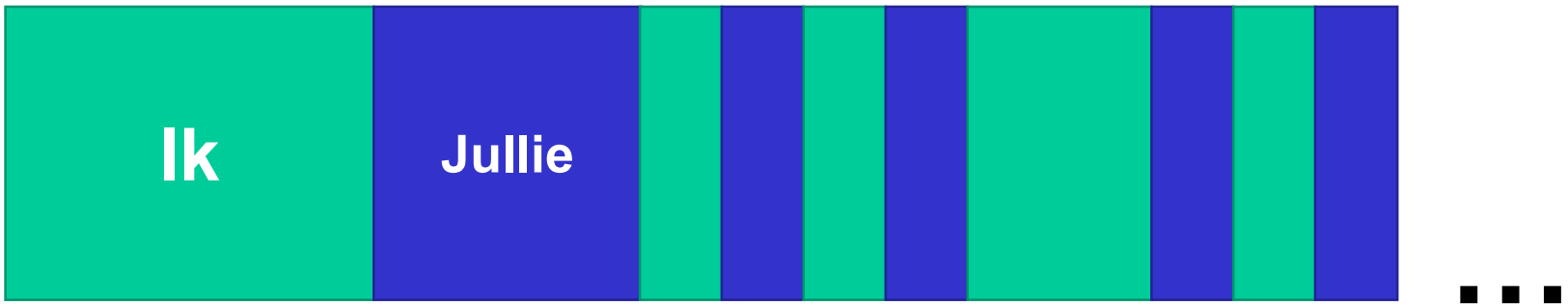
- Dag 1 – Intro & Data binding
  - Theory - Introductie & geschiedenis - why Angular
  - Hello World in Angular –boilerplate-code
  - Concepts, context & architecture
  - Angular CLI
  - Components
  - Data binding

2 Richtlijnen

1. Oefeningen
    - Maar: neem ook vooral zijpaden, experimenteer, lees verder, maak een eigen project, app, website…

2. Voorbeeldcode
    - Als ondersteuning bij de oefeningen, zie boven
    - Work in progress – check de Angular-site!
    - github.com/PeterKassenaar/voorbeeldenAngular2

Globale werkwijze



Vragen?

Angular vs. The Rest

Differences, similarities, new features

Addressing the "WHY" question!

WHY, would we want to use a frontend framework.

It is all HTML, CSS and JavaScript right?

Rethorical question:

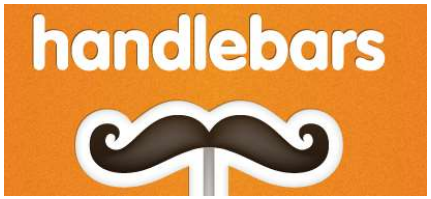
"Do we want to go back

to the jQuery days?"

speed, consistency, not re-inventing the wheel, community, performance, testing….

Old school web apps

HTML + templates



Data Binding

Routing

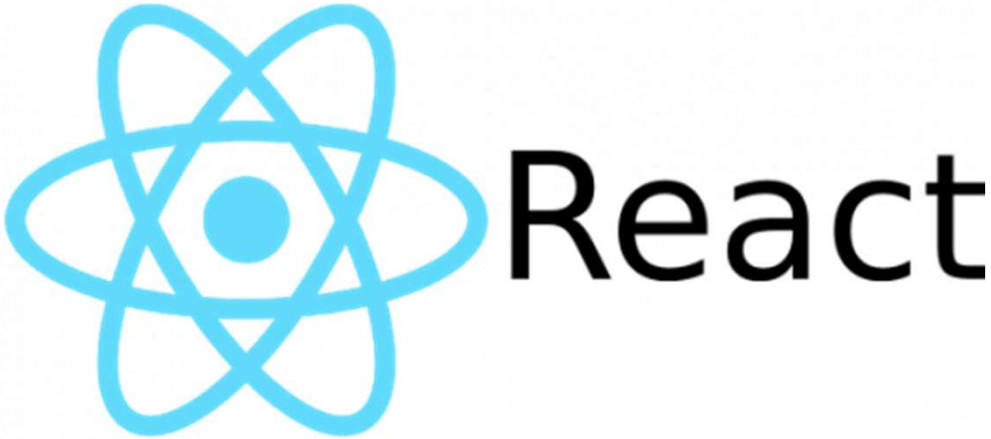
DOM-manipulation

Mobile development

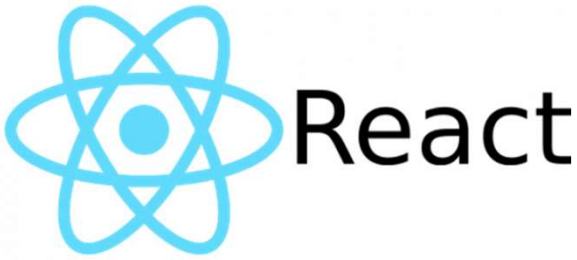
...

“The Frankenstein Framework”

Front-end Frameworks – the big four



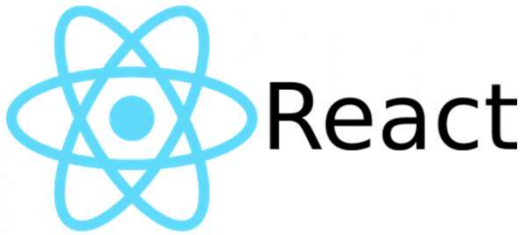
Similarities



- Creating Single Page Applications
- Based on components
- Data binding, props, events, routing, state management, …
- Huge ecosystem
- Huge community
- High adaptation rate

Differences (apart from syntax)

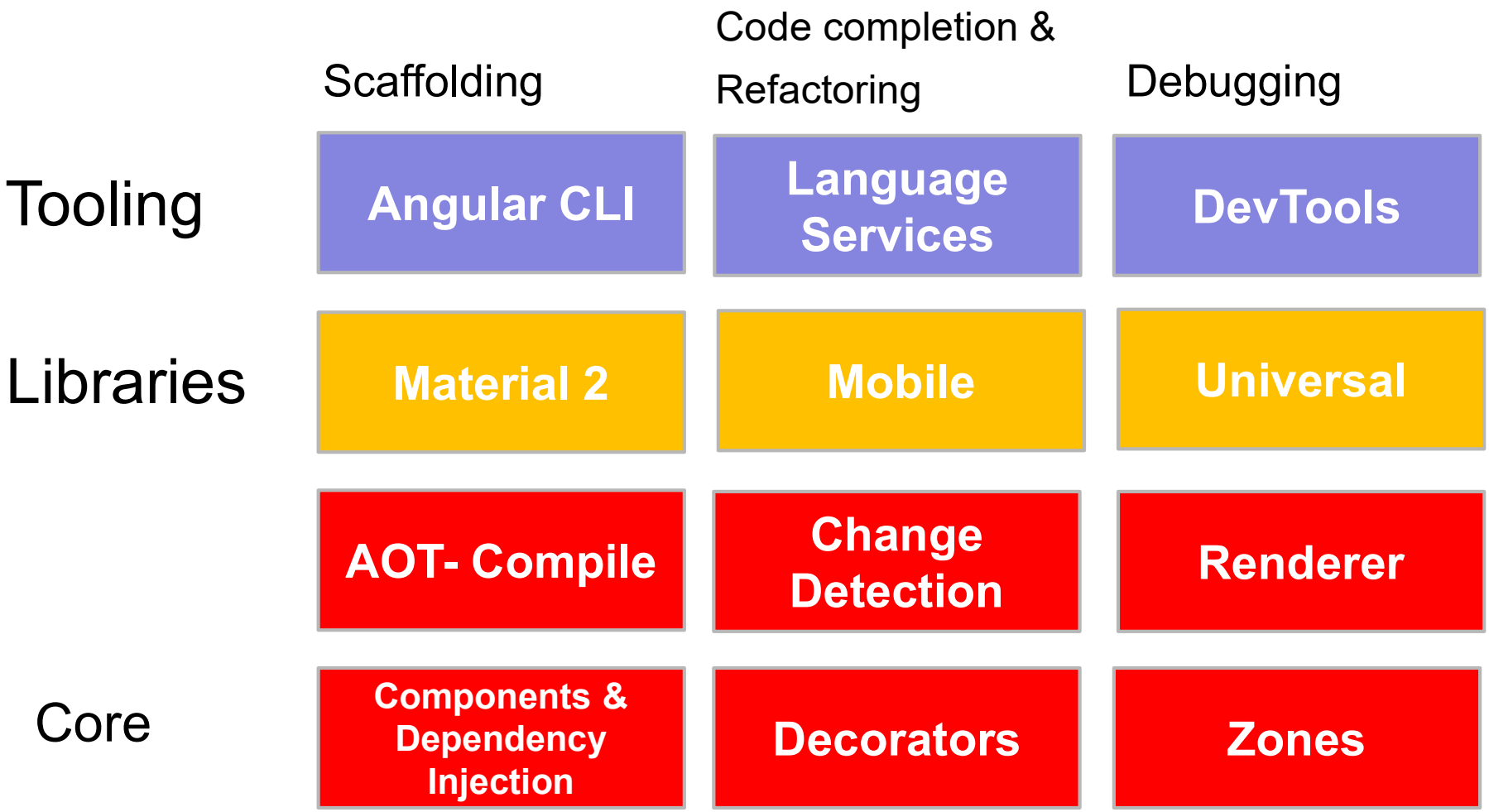
- Point of departure: HTML template, enhanced with framework specific tags and attributes
- One-stop-shop / solution

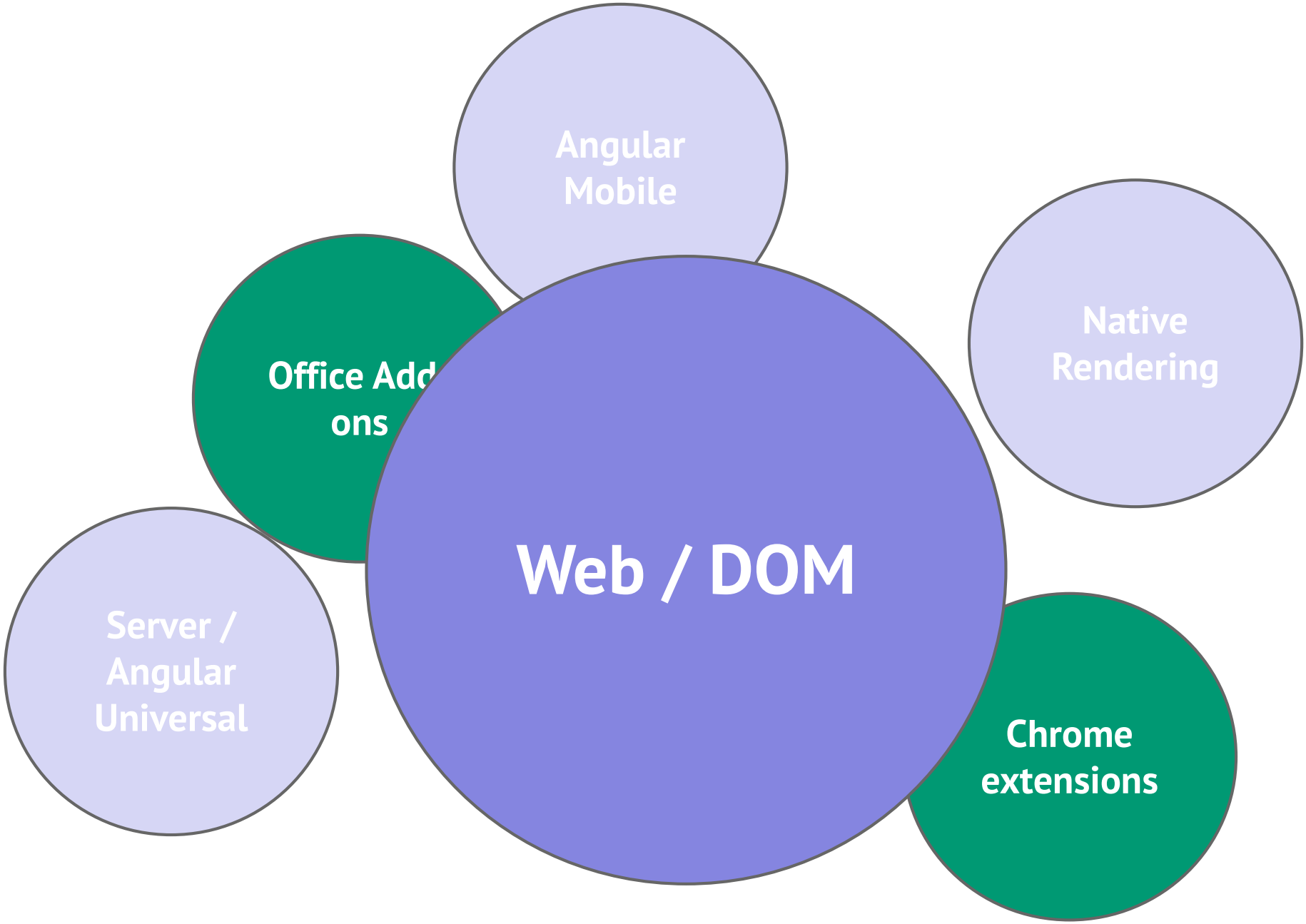


- Point of departure: JavaScript, JavaScript, JavaScript (JSX)
- Build-all-yourself / choice anxiety

Platform

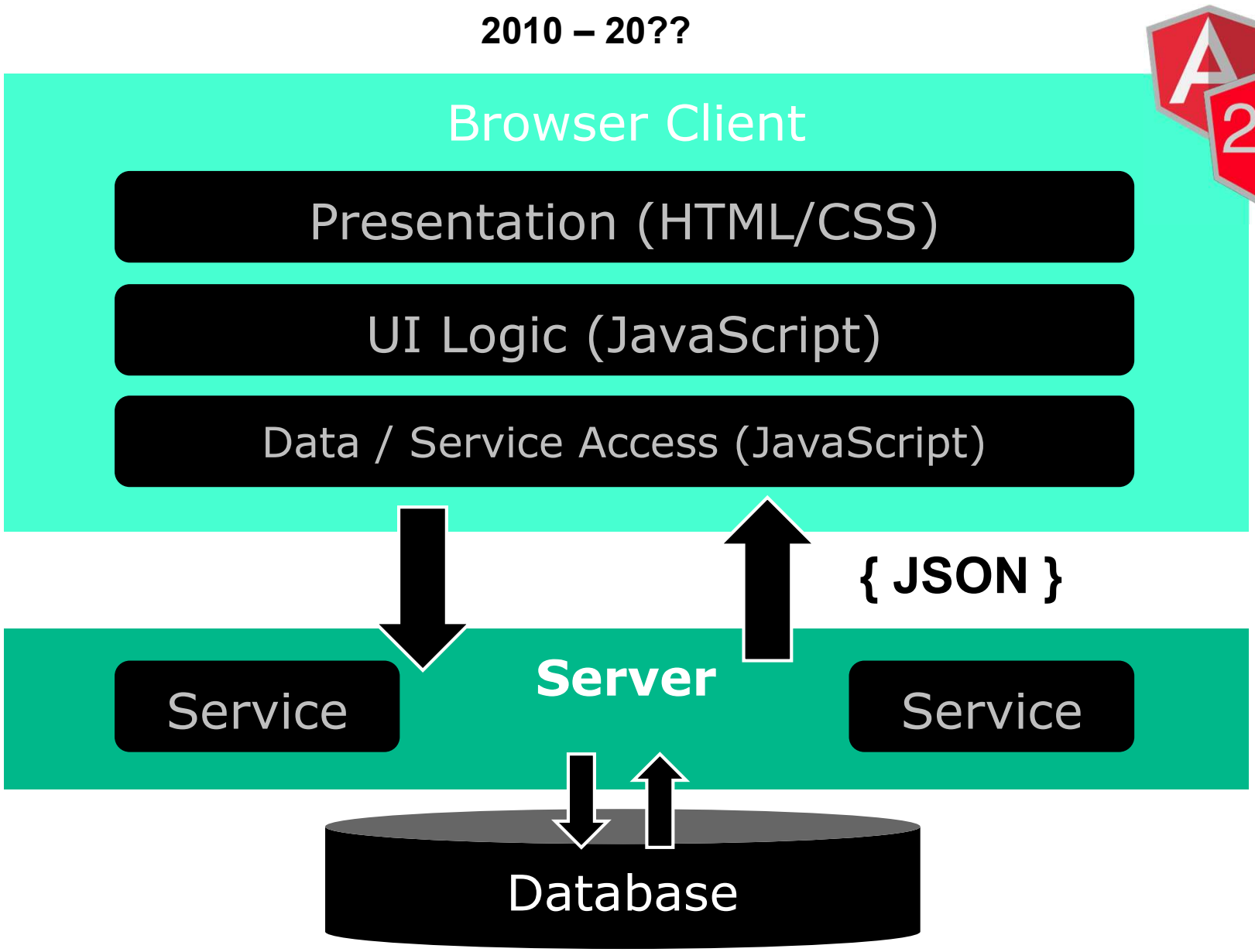
Platform Features



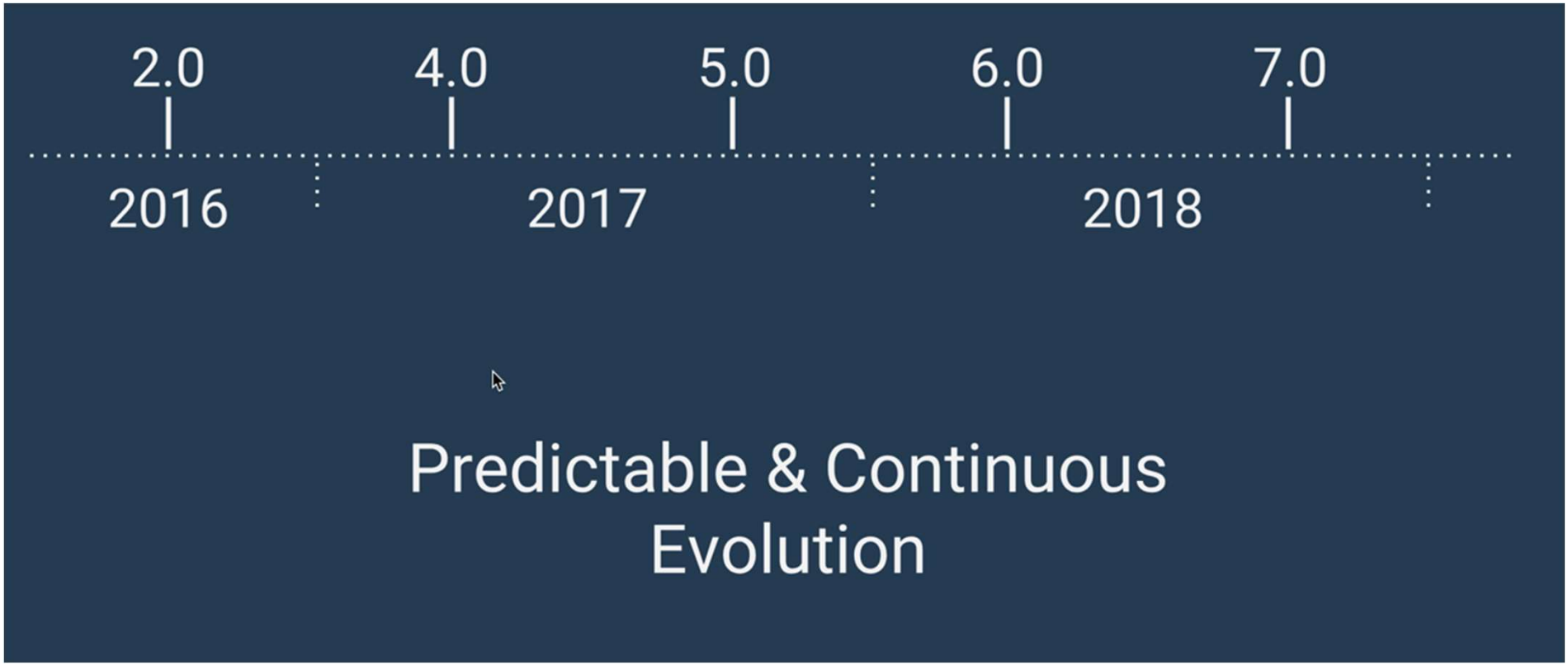

Angular
Mobile
Native
Rendering
Office Add
ons
Web / DOM
Server /
Angular
Universal
Chrome
extensions

Single Page Application

2010 – 20??



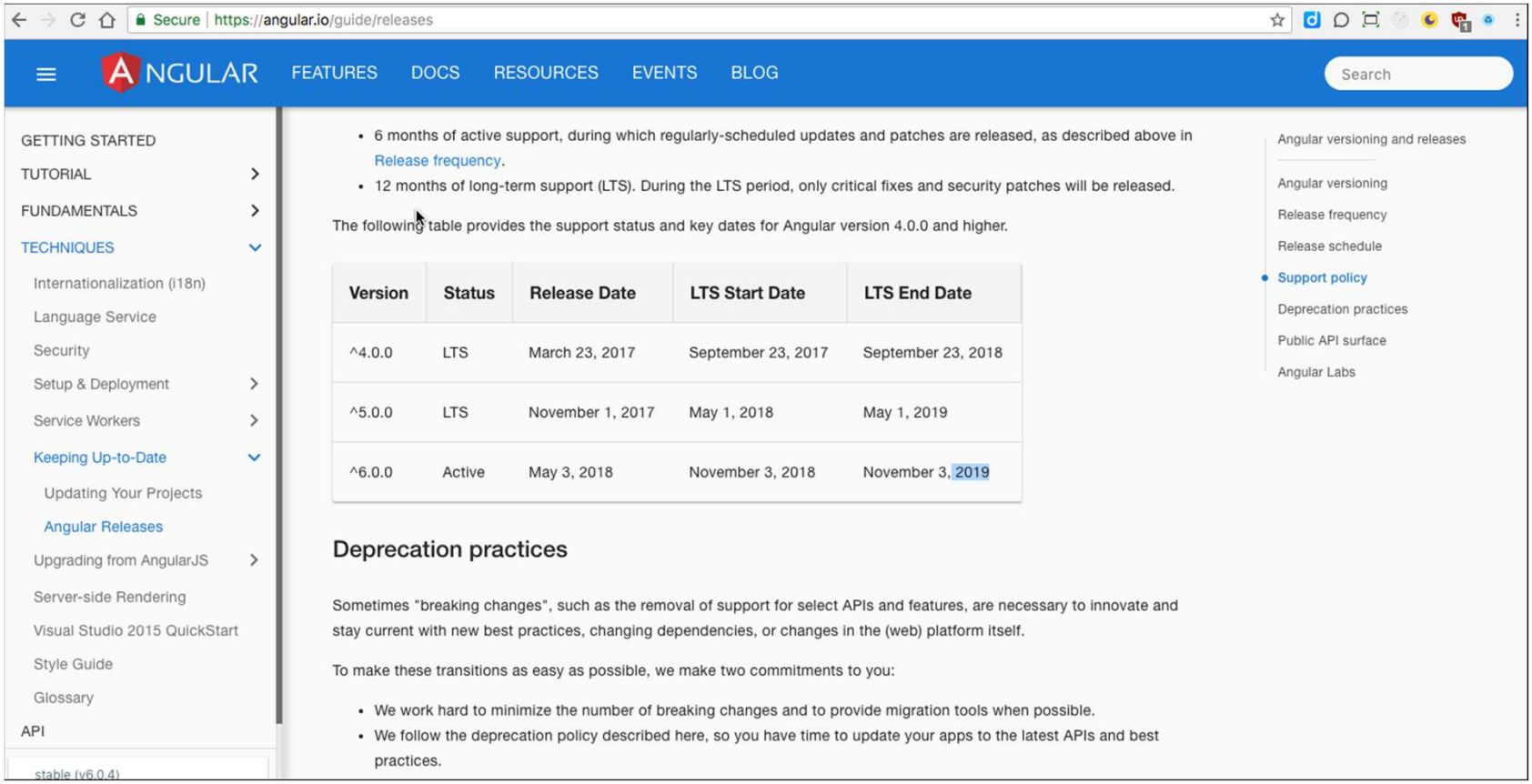
@IgorMinar, Nov. 9, 2018


2.0
4.0
5.0
6.0
7.0
2016
2017
2018
Predictable & Continuous
Evolution

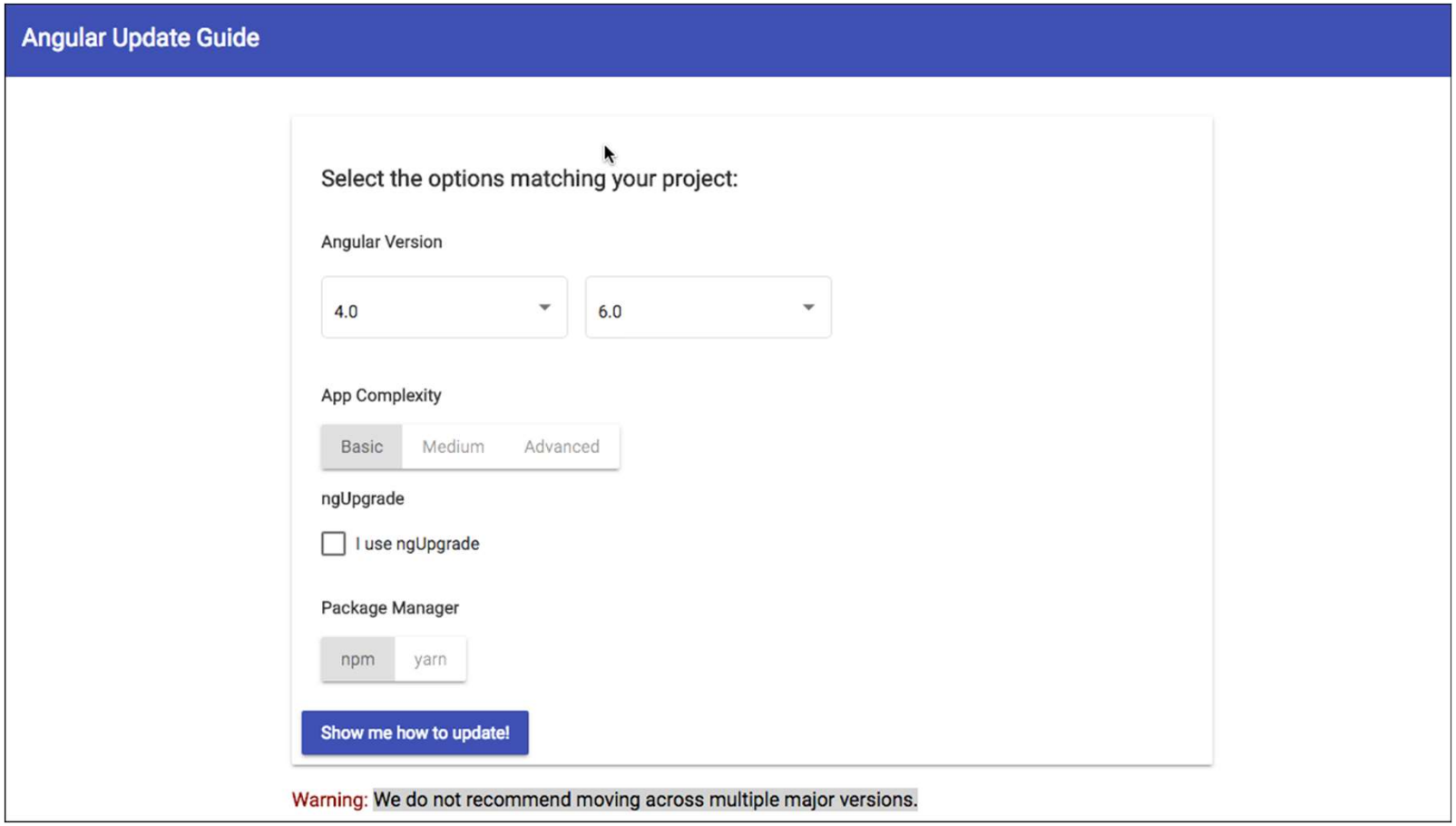

2.0
4.0
5.0
6.0
7.0
2016
2017
2018
✅ Predictability
✅ Painless Updates
✅ Long Term Support

Angular Versies en -Long Time Support

→ https://angular.io/guide/releases

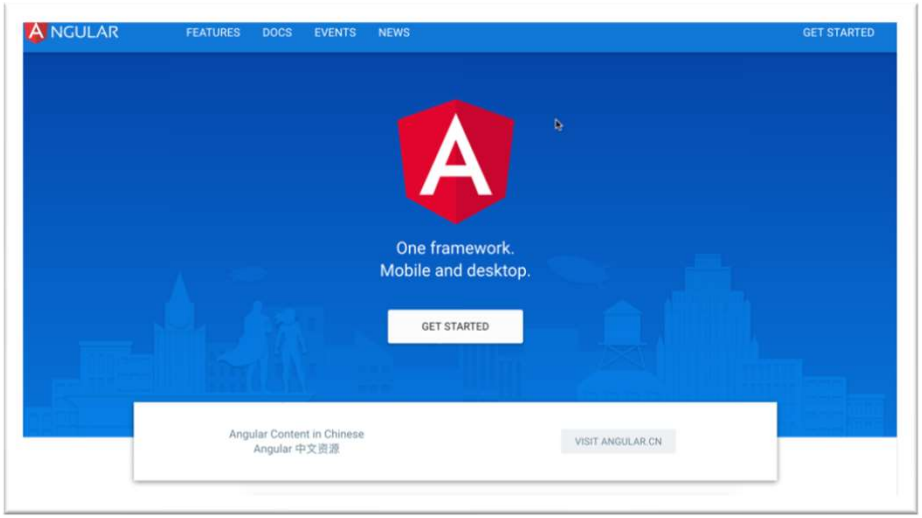


https://update.angular.io/

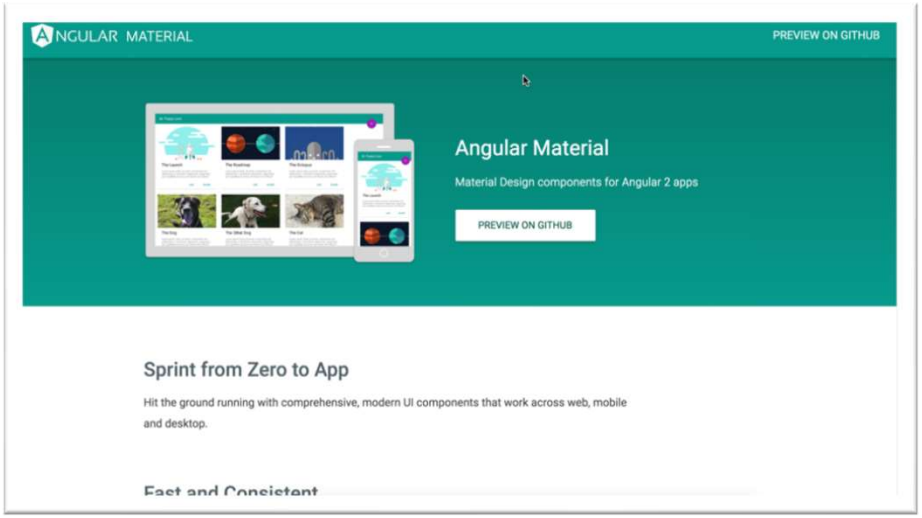


“It's just *Angular*”

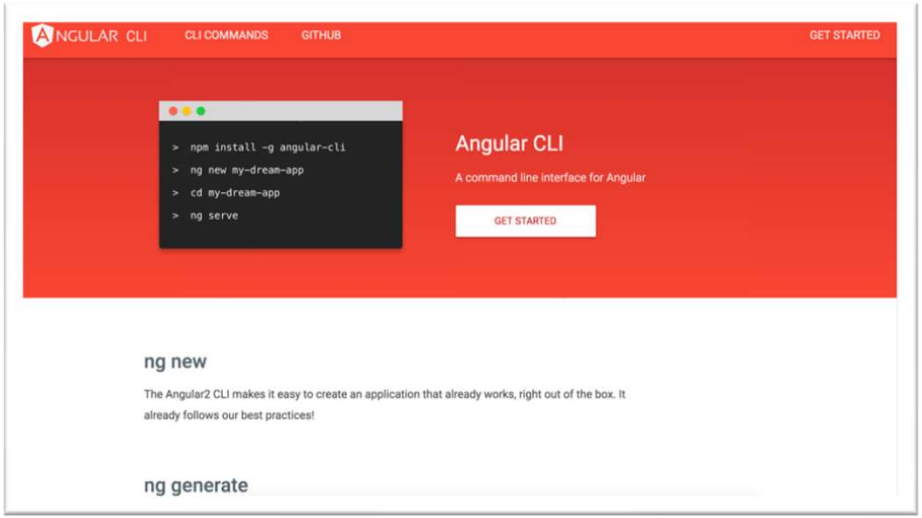
Angular as a Platform



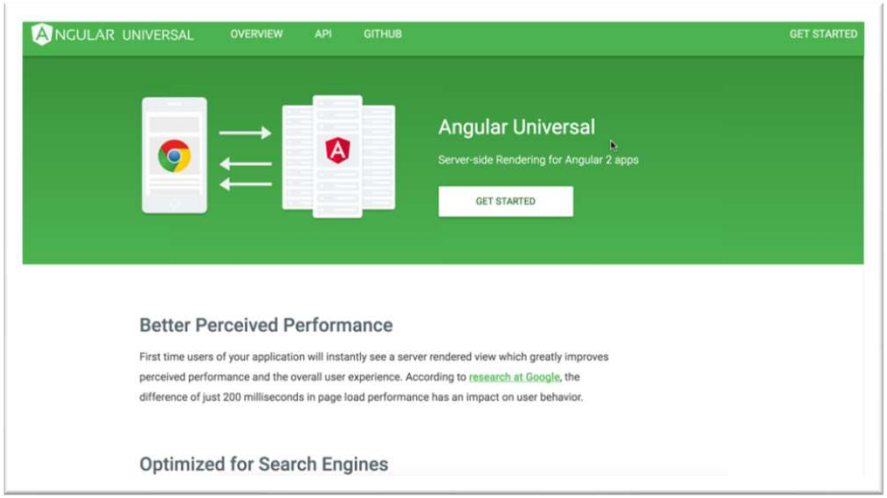
https://angular.io/



https://material.angular.io/

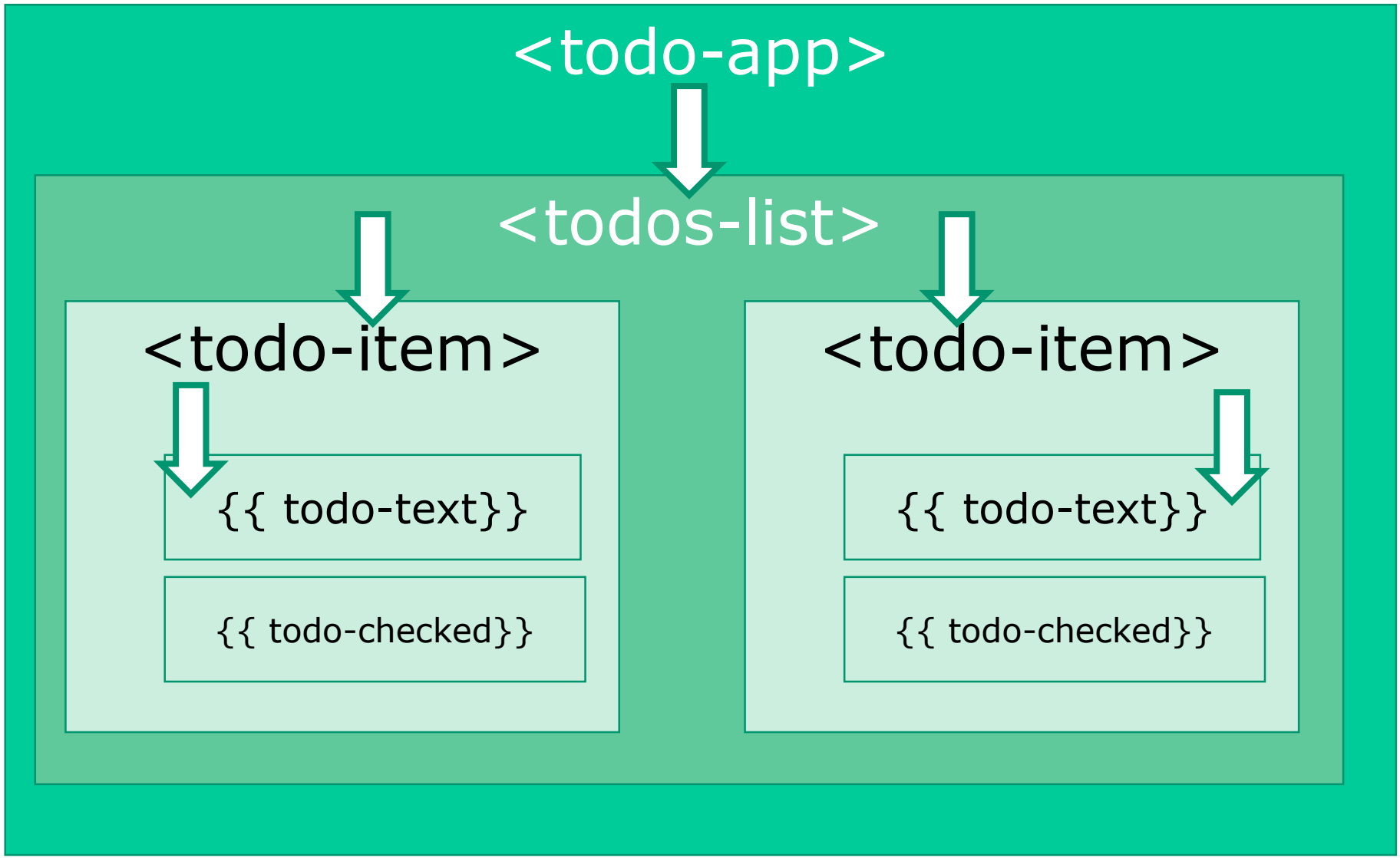


https://cli.angular.io/



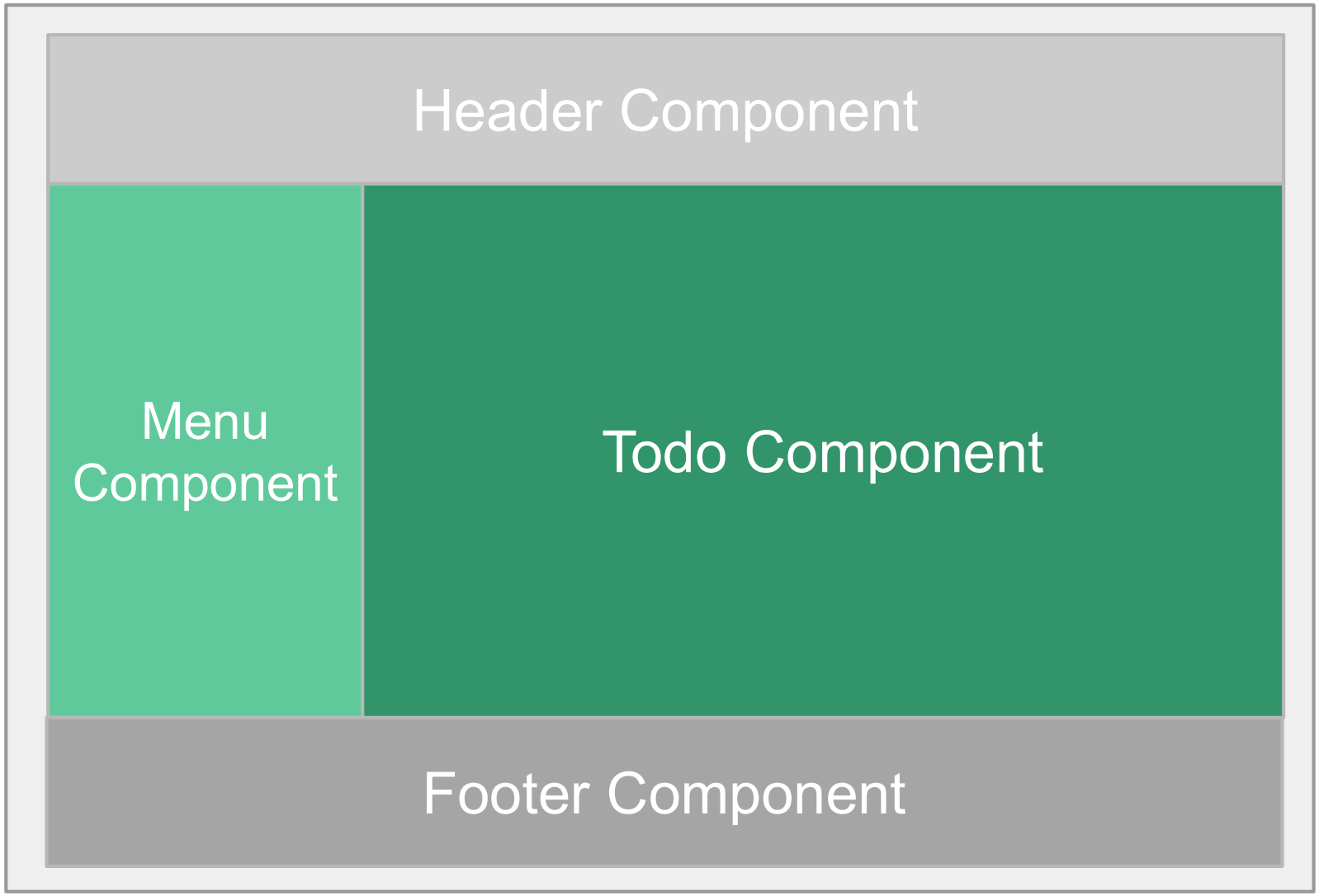
https://universal.angular.io/

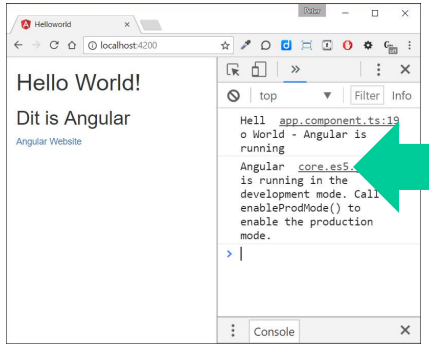
Angular 2 - components



"An Angular-app is a tree of components"

Components – visual representation





main.ts / bootstrapper

ngModule / root module

AppComponent

Other components

Other components

Other components

Services

3rd party libs

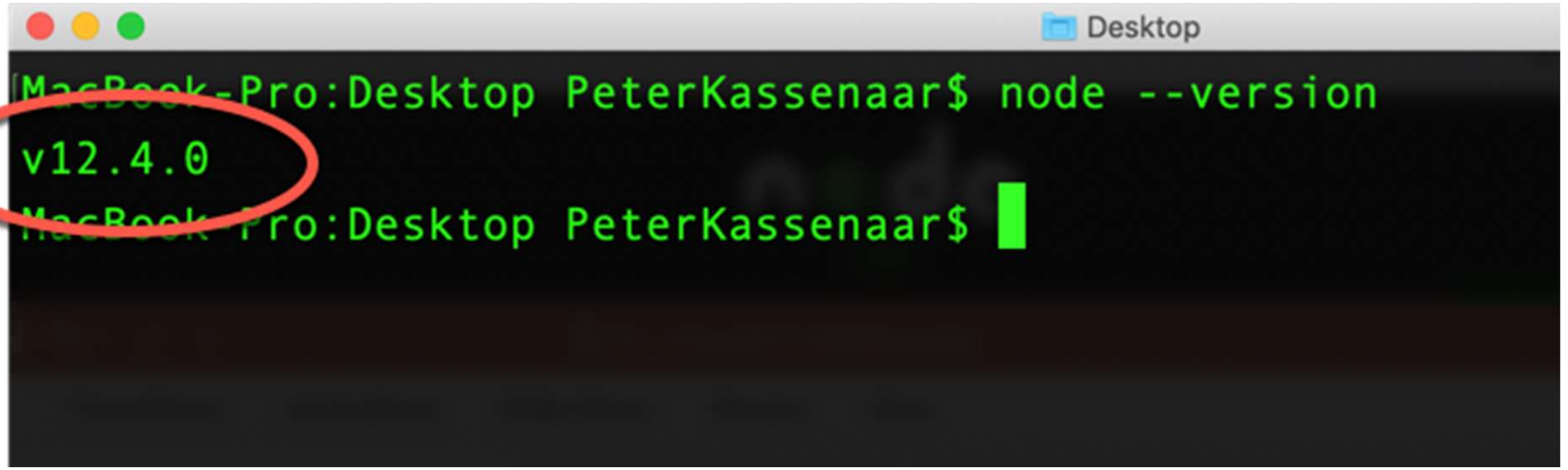
Other modules

Let’s write some code

Hello World in Angular

Angular development dependency: NodeJS 12+

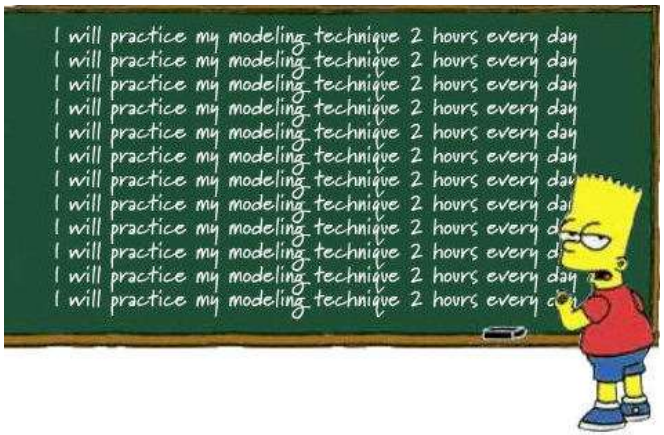
Node – check your version



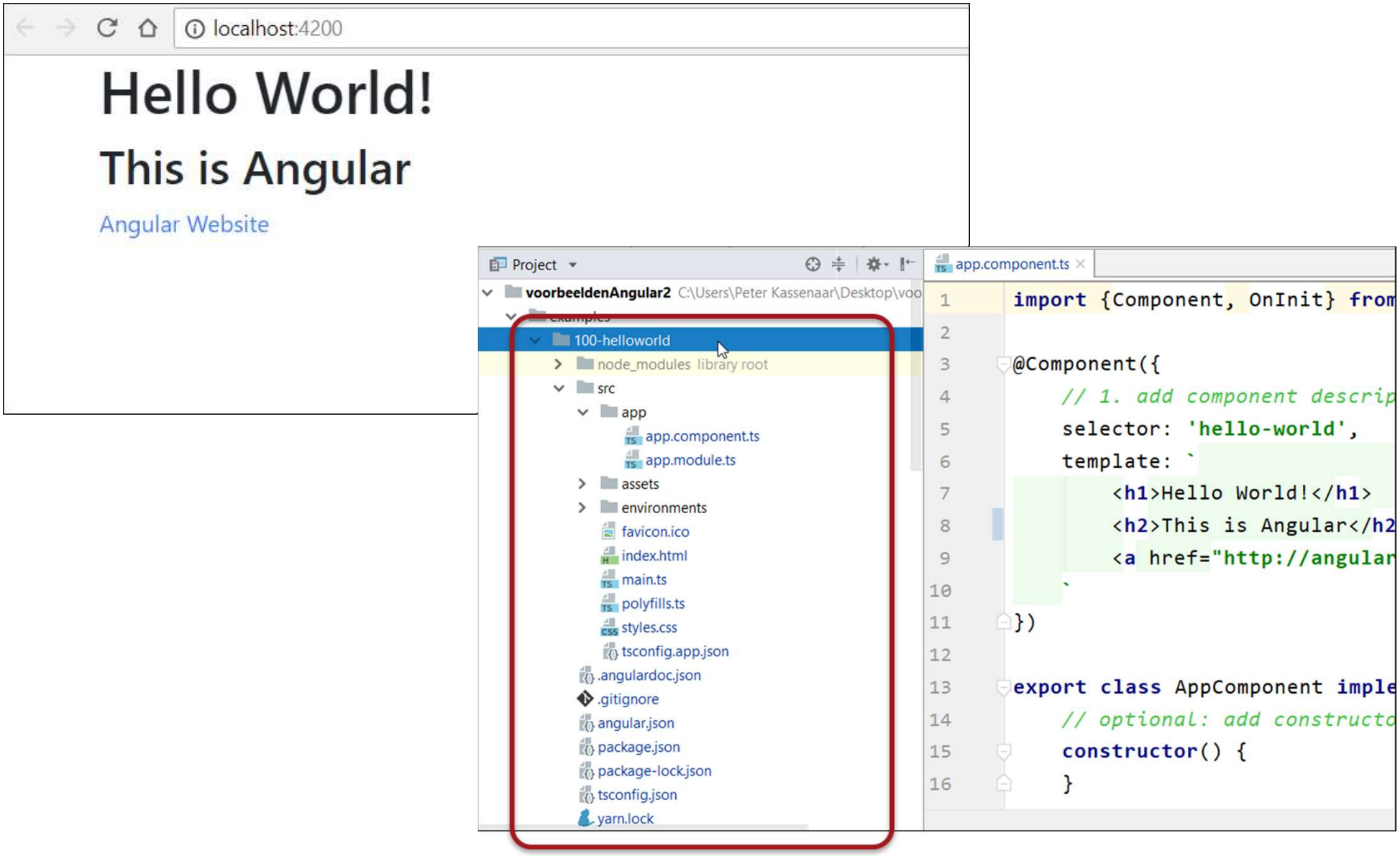
Mini workshop

- Download or clone https://github.com/PeterKassenaar/voorbeeldenAngular2

```
cd examples

cd 100-helloworld

npm install

npm start
```



- Go to browser: http://localhost:4200


localhost:4200
Hello World!
This is Angular
Angular Website
Project
voorbeeldenAngular2 C:\Users\Peter Kassenaar\Desktop\voo
100-helloworld
node_modules library root
src
app
app.component.ts
app.module.ts
assets
environments
favicon.ico
index.html
main.ts
polyfills.ts
styles.css
tsconfig.app.json
.angulardoc.json
.gitignore
angular.json
package.json
package-lock.json
tsconfig.json
yarn.lock
app.component.ts
import {Component, OnInit} from
@Component({
// 1. add component descrip
selector: 'hello-world',
template: `
<h1>Hello World!</h1>
<h2>This is Angular</h2
<a href="http://angular
`
})
export class AppComponent imple
// optional: add constructo
constructor() {
}

Boilerplate code for Hello World

Steps

1. Set up environment, boilerplate & libraries
    - Important configuration files
2. Angular Component(s)
3. Angular Module(s): @ngModule()
4. Bootstrap our module
5. Write HTML-pagina (`index.html`)

Boilerplate files #1 - `package.json`

```
{
  "name": "hello-angular",
  "description": "Voorbeeldproject bij de training Angular (C) - info@kassenaar.com",
  "version": "0.0.1",
  "license": "MIT",
  "scripts": {
    "ng": "ng",
    "start": "ng serve",
    "build": "ng build",
  },
  "private": true,
  "dependencies": {
    "@angular/animations": "6.0.0",
    "@angular/common": "6.0.0",
    "@angular/compiler": "6.0.0",
    "@angular/core": "6.0.0",
    "@angular/forms": "6.0.0",
    "rxjs": "^6.1.0",
    "zone.js": "^0.8.26"
  },
  "devDependencies": {
    "@angular-devkit/build-angular": "~0.6.0",
    "@angular/cli": "6.0.0",
    "typescript": "2.7.2"
  },
  "author": "Peter Kassenaar <info@kassenaar.com>"
}
```

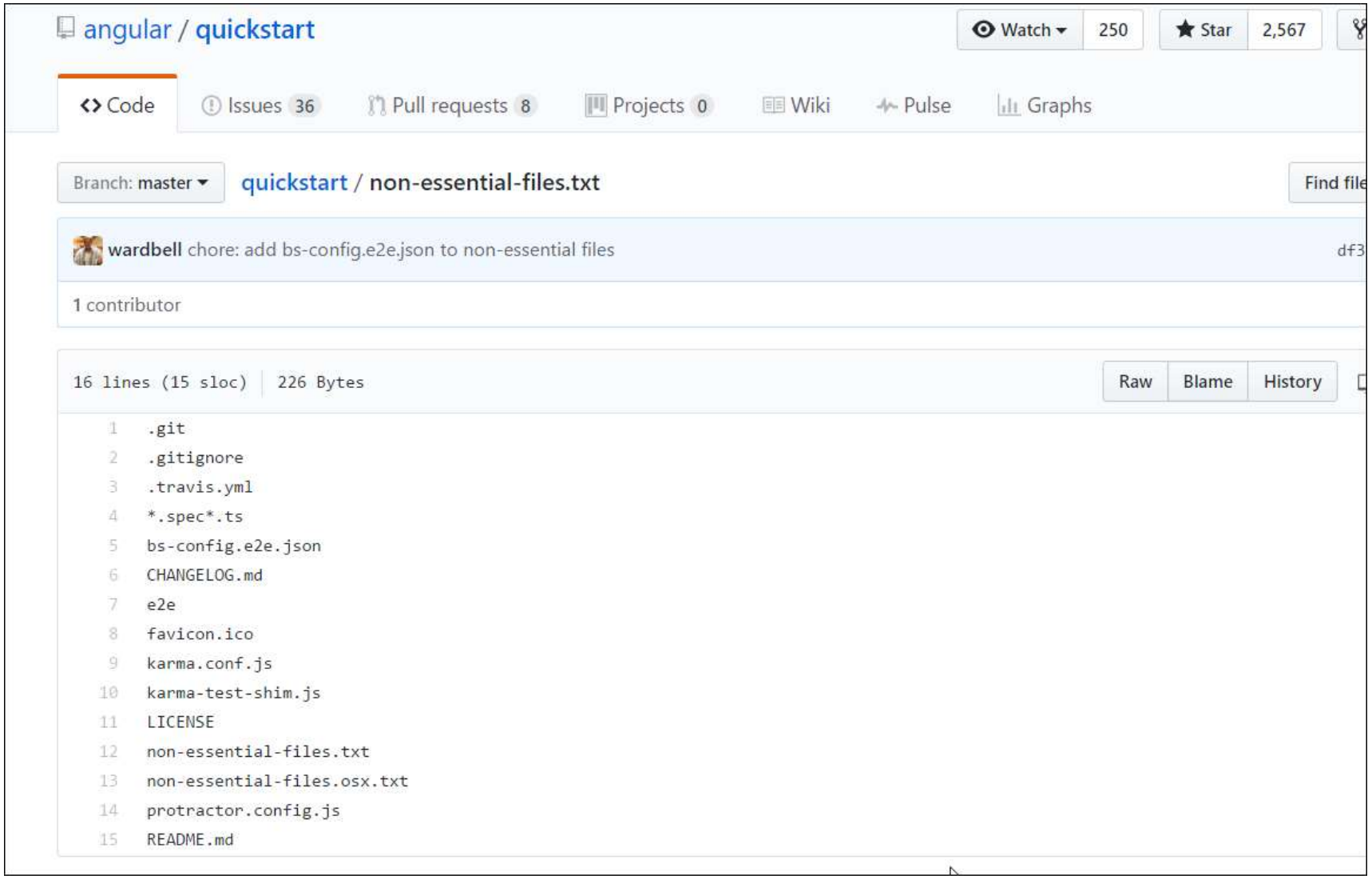
Boilerplate files #2 - `tsconfig.json`

```
{
  "compileOnSave"  : false,
  "compilerOptions": {
   "outDir"                 : "./dist/out-tsc",
   "baseUrl"                : "src",
   "sourceMap"              : true,
   "declaration"            : false,
   "moduleResolution"       : "node",
   "emitDecoratorMetadata" : true,
   "experimentalDecorators": true,
   "target"                 : "es5",
   "typeRoots"              : [
     "node_modules/@types"
   ],
   "lib"                    : [
     "es2016",
     "dom"
   ]
  }
}
```

Boilerplate files #3 – **angular.json**

```
{
  "$schema": "./node_modules/@angular/cli/lib/config/schema.json",
  "version": 1,
  "newProjectRoot": "projects",
  "projects": {
    "helloworld": {
      "root": "",
      "sourceRoot": "src",
      "projectType": "application",
      "architect": {
        "build": {
          "builder": "@angular-devkit/build-angular:browser",
          "options": {
            "outputPath": "dist",
            "index": "src/index.html",
            "main": "src/main.ts",
            "tsConfig": "src/tsconfig.app.json",
      …
}
```

"Nice to have" - non-essential files



https://github.com/angular/quickstart/blob/master/non-essential-files.txt

Step 2 – Component

Convention - components in directory `/src/app`

Or: edit in `angular.json`

Filename: `src/app/app.component.ts`

```
import {Component} from ‘@angular/core';
@Component({
   selector: 'hello-world',
   template: '<h1>Hello Angular</h1>'
})
export class AppComponent {

}
```

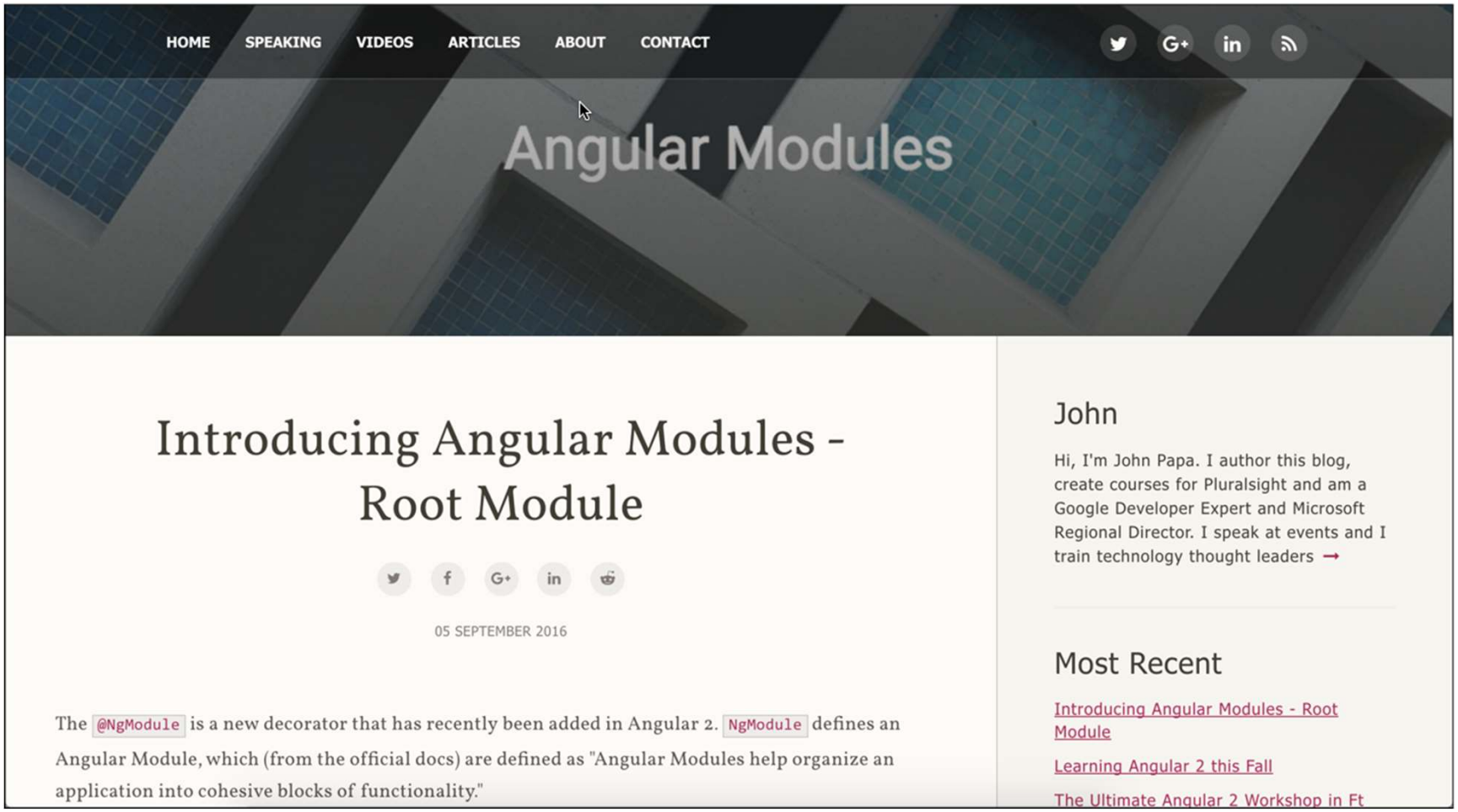
Step 3 – @ngModule

Convention - filename: `/src/app.module.ts`

```
// Angular Modules
import {NgModule}      from '@angular/core';
import {BrowserModule} from '@angular/platform-browser';

// Custom Components
import {AppComponent} from './app.component';

// Module declaration
@NgModule({
   imports     : [BrowserModule],
   declarations: [AppComponent],
   bootstrap   : [AppComponent]
})
export class AppModule {
}
```

Root Module of the application

Some background info on Root Module



https://johnpapa.net/introducing-angular-modules-root-module/

Step 4 - bootstrap component

Best practice: bootstrap app in separate component

Convention: `main.ts`, of `app.main.ts`.

```
import {enableProdMode} from '@angular/core';
import {platformBrowserDynamic} from '@angular/platform-browser-dynamic';

import {AppModule} from './app/app.module';
import {environment} from './environments/environment';

if (environment.production) {
   enableProdMode();
}

platformBrowserDynamic().bootstrapModule(AppModule);
```

Step 5 – index.html

`index.html` - simple HTML file - expanded at runtime by WebPack

Header:

```
<html>


<head>
  <meta charset="utf-8">
  <title>Helloworld</title>
  <base href="/">


  <meta name="viewport" content="width=device-width, initial-scale=1">
  <link rel="icon" type="image/x-icon" href="favicon.ico">
</head>
```

Body van index.html

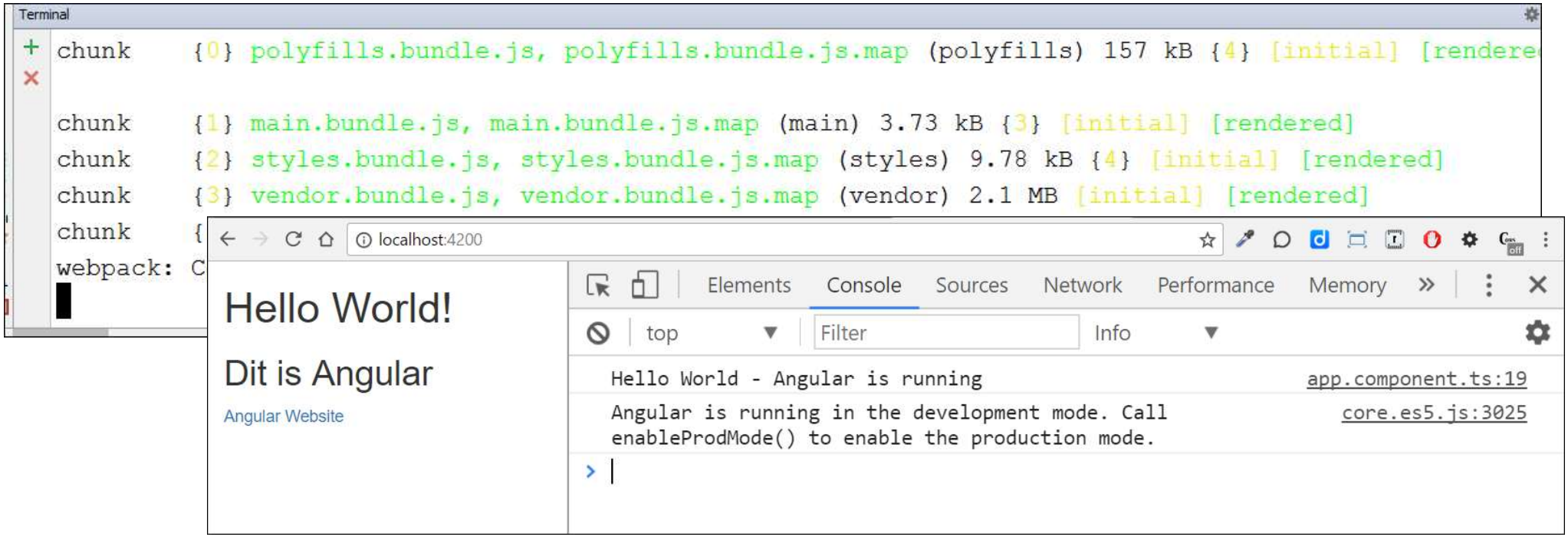
Verwijzing naar de root-component:

```
<body>
  <hello-world>
    Bezig met laden...
  </hello-world>
</body>
```

App draaien

`npm start` – draait de scriptopdracht start uit `package.json`.

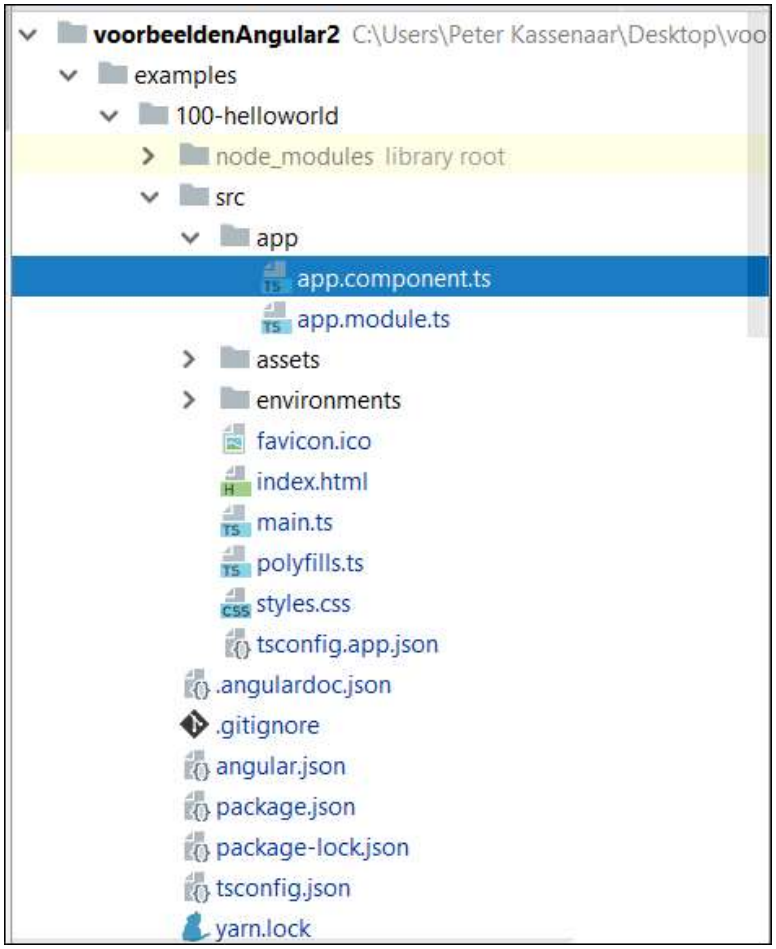
`ng serve` - start globale angular-cli instantie

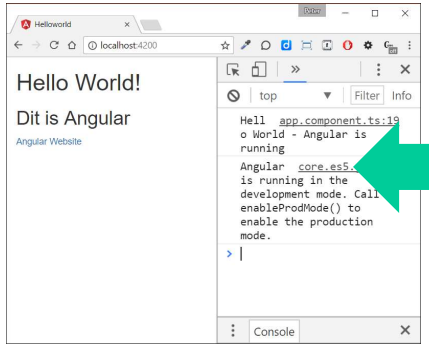


Daarna: wijzigingen aanbrengen in `app.component.ts`

– worden opgepikt door Live Reload

Basic Project Structure





main.ts / bootstrapper

ngModule / root module

AppComponent

Other components

Other components

Other components

Services

3rd party modules

Other modules

Assets

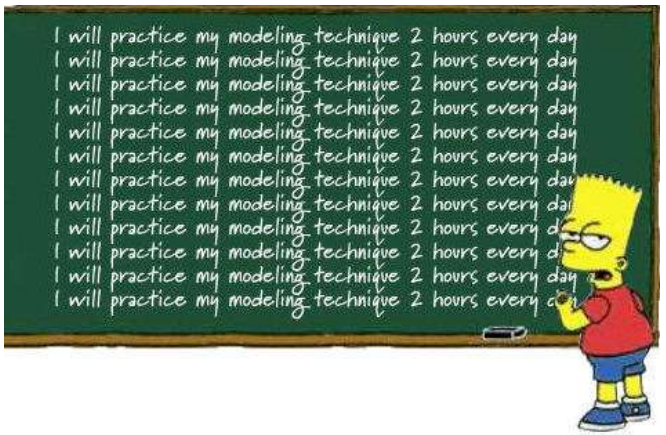
github.com/PeterKassenaar/voorbeeldenAngular2

Oefeningen en meer voorbeeldcode

Checkpoint

- Er is aardig wat boilerplate code nodig om een Angular-app te starten
- Vier stappen
    1. Set up environment, boilerplate & libraries
    2. Schrijf Angular Root Component voor de app
    3. Bootstrap de component
    4. Schrijf HTML-pagina (`index.html`)
- Daarna: app gaan uitbreiden
- Oefening `1a), 1b), 1c), 1d)`

Oefening….



Angular CLI

Snel nieuwe projecten instellen via de command line

Angular-CLI to the rescue

- Het *is* mogelijk nieuwe Angular-projecten from scratch te starten.
- Met de CLI is eenvoudiger.
- CLI-options:
  - Scaffolding
  - Generating
  - Testing
  - Building
  - AOT-Compiling
  - …

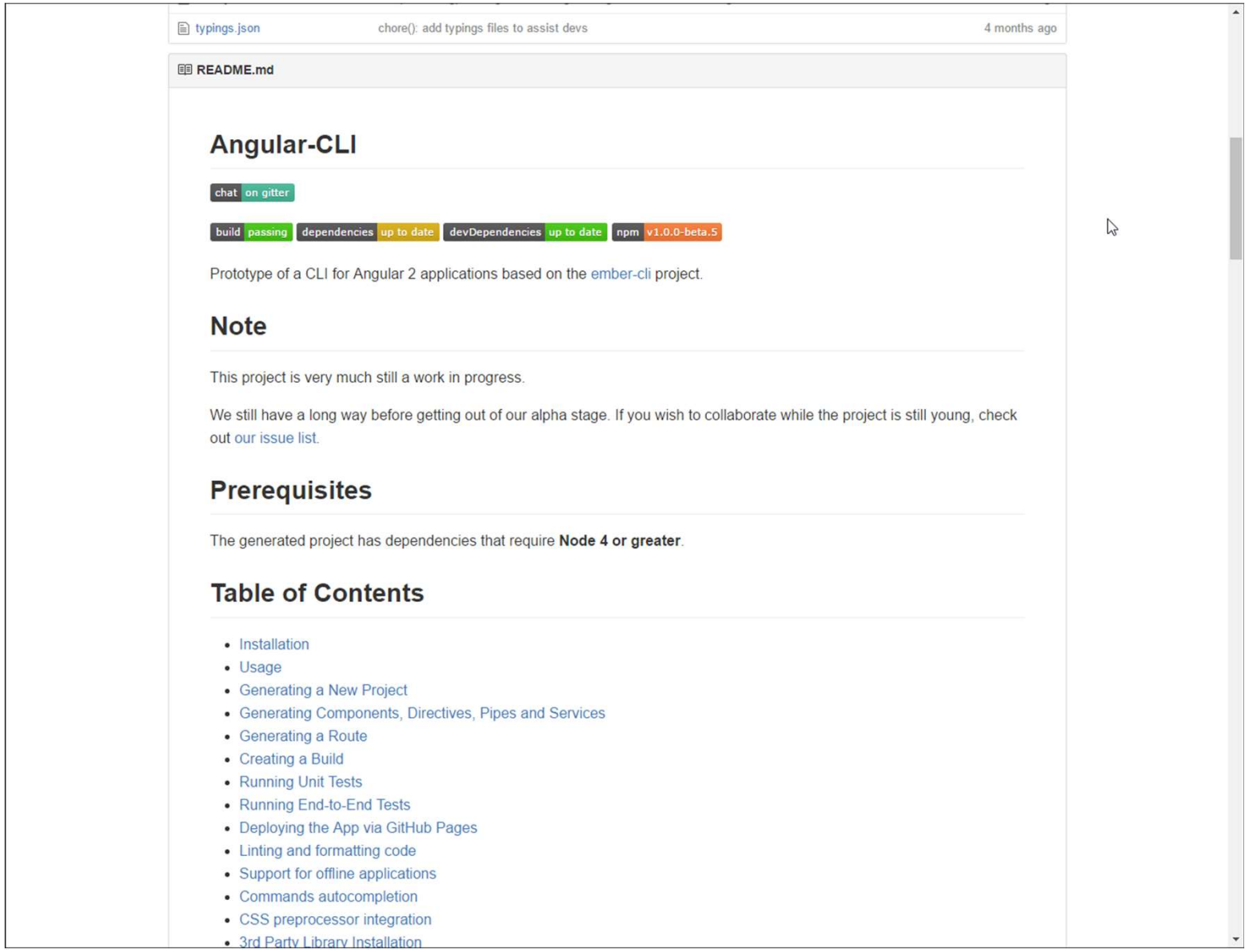
Scaffolding - Angular CLI

Projecten, componenten, routes en meer definiëren vanaf de command line

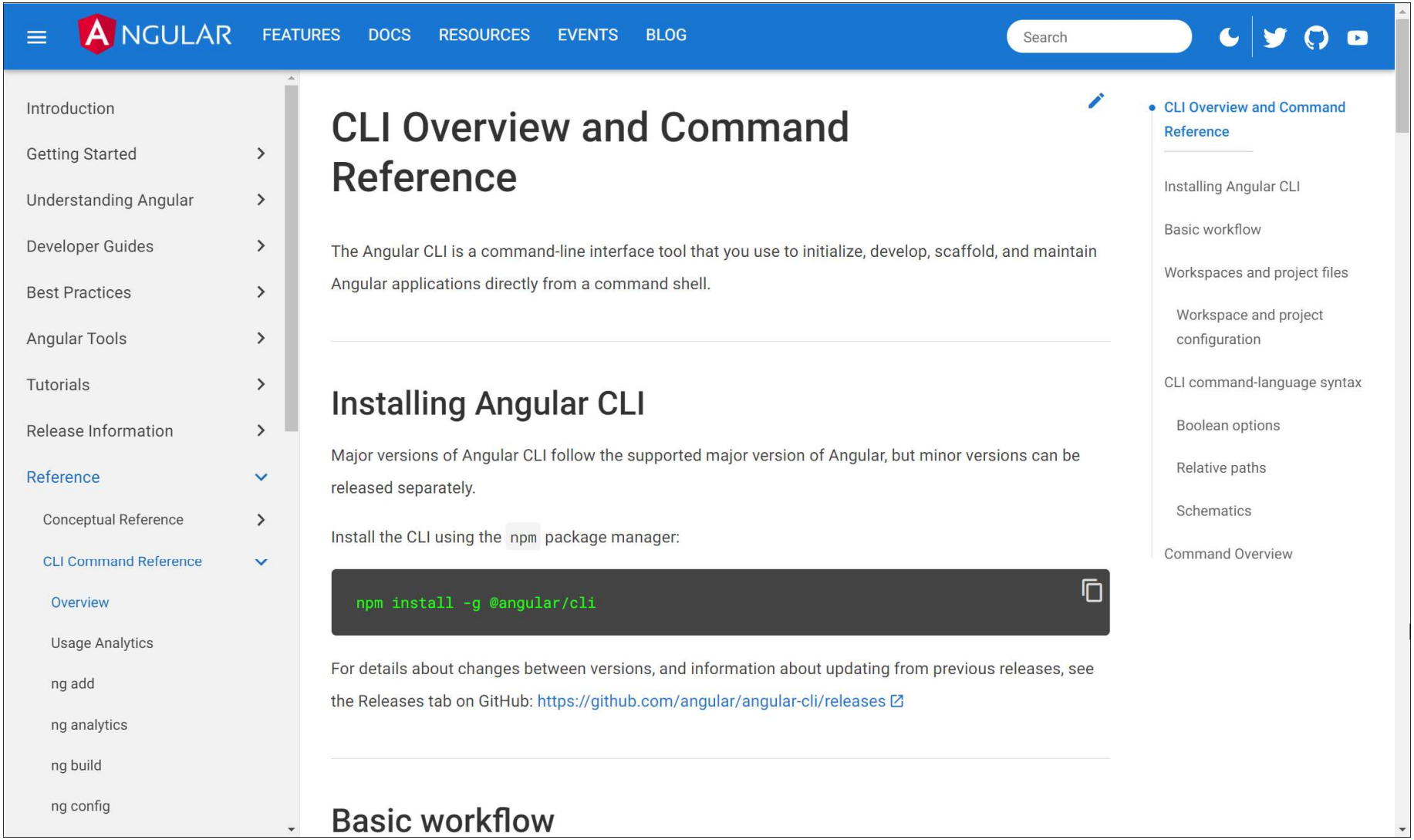
https://github.com/angular/angular-cli

en

https://cli.angular.io/

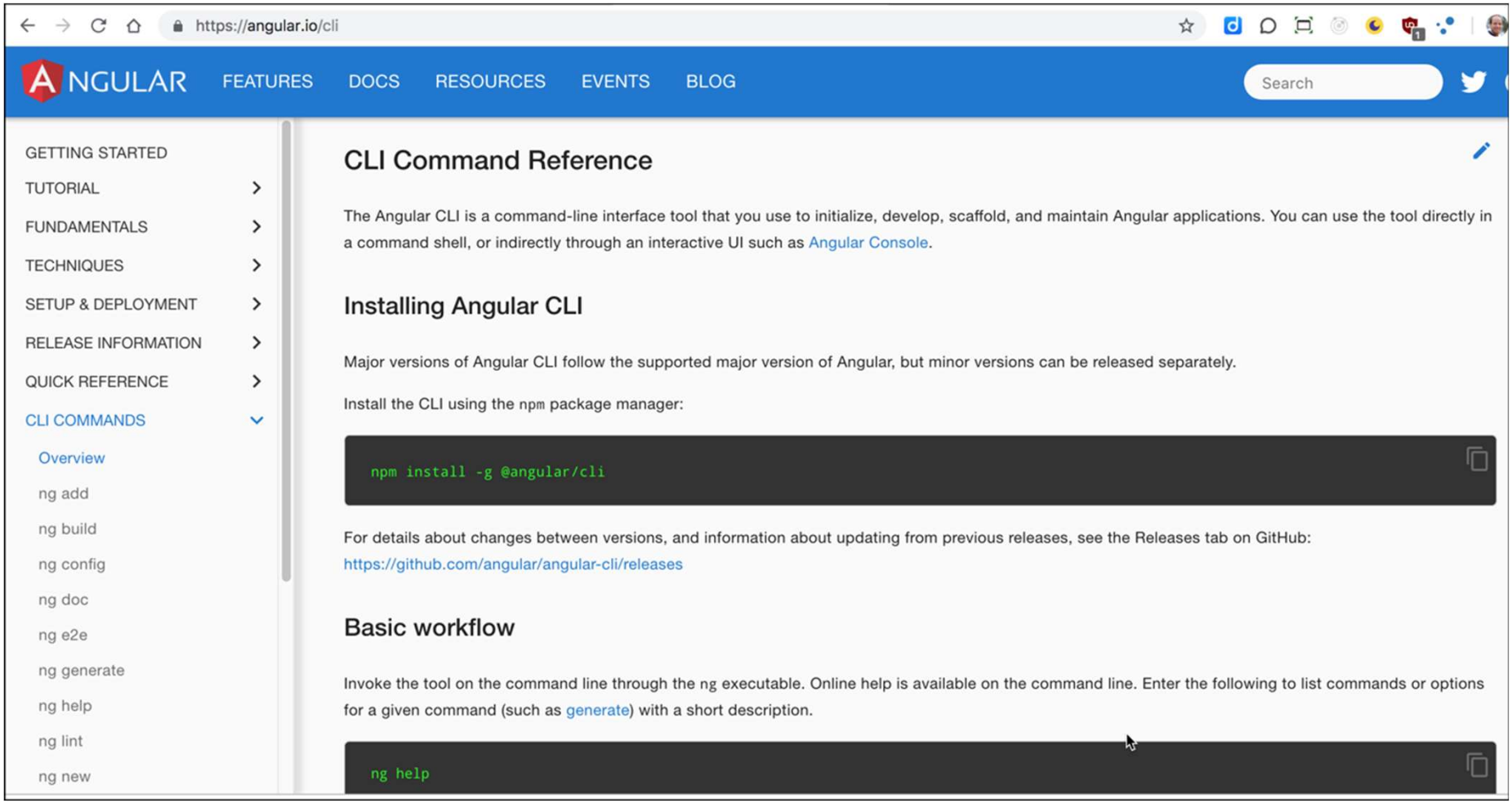



```
npm install -g @angular/cli
```


ANGULAR
FEATURES
DOCS
RESOURCES
EVENTS
BLOG
Search
Introduction
Getting Started
Understanding Angular
Developer Guides
Best Practices
Angular Tools
Tutorials
Release Information
Reference
Conceptual Reference
CLI Command Reference
Overview
Usage Analytics
ng add
ng analytics
ng build
ng config
CLI Overview and Command Reference
Installing Angular CLI
Basic workflow
Workspaces and project files
Workspace and project configuration
CLI command-language syntax
Boolean options
Relative paths
Schematics
Command Overview
CLI Overview and Command Reference
The Angular CLI is a command-line interface tool that you use to initialize, develop, scaffold, and maintain Angular applications directly from a command shell.
Installing Angular CLI
Major versions of Angular CLI follow the supported major version of Angular, but minor versions can be released separately.
Install the CLI using the npm package manager:
npm install -g @angular/cli
For details about changes between versions, and information about updating from previous releases, see the Releases tab on GitHub: https://github.com/angular/angular-cli/releases
Basic workflow

https://www.youtube.com/watch?v=wHZe6gGI5RY

Documentatie - in de Angular Docs

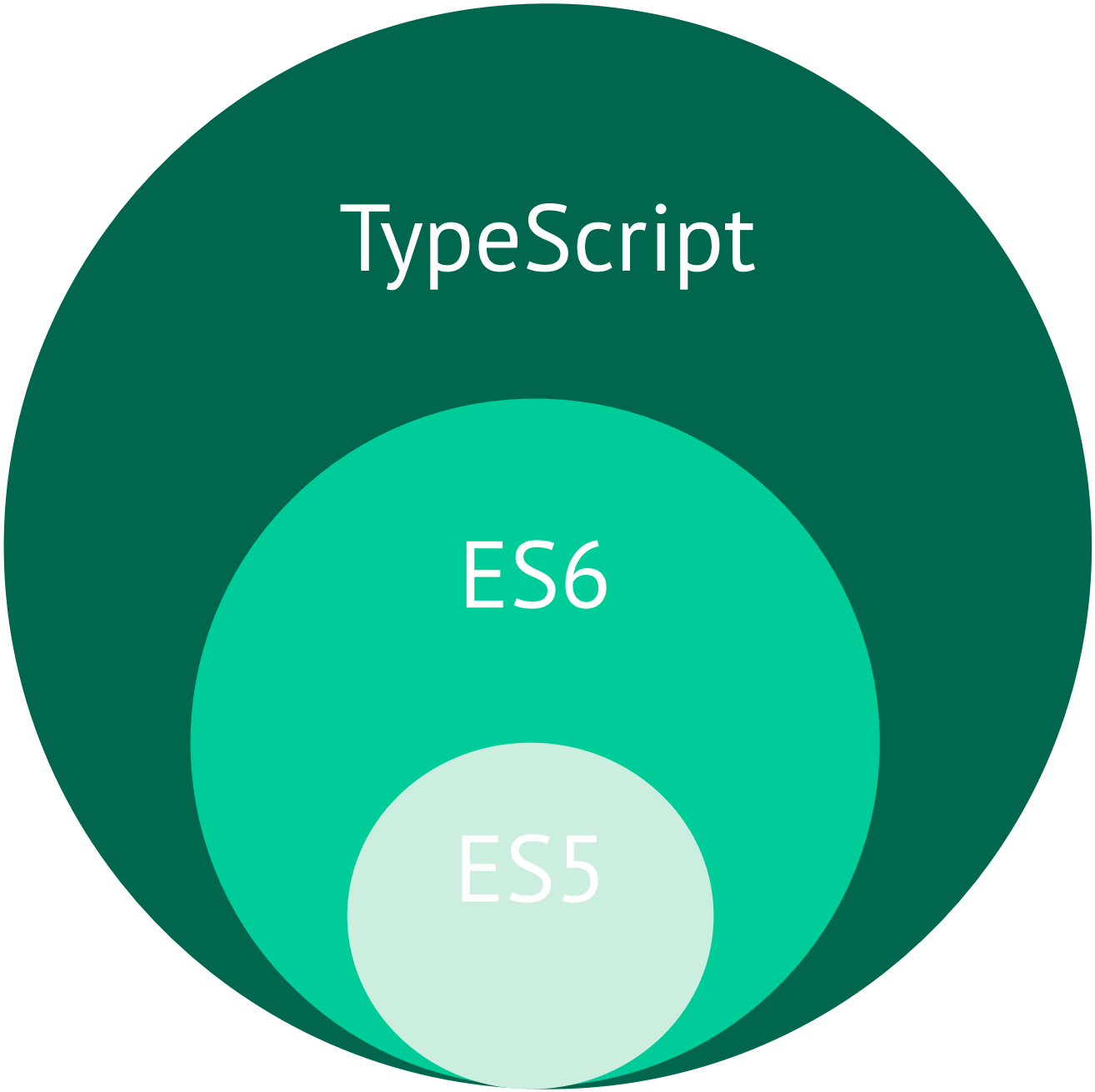


https://angular.io/cli

Angular 2 Code - Backend

Kort over TypeScript en ES6

Programmeertalen


TypeScript
ES6
ES5

ES6 en TypeScript

De toekomst van JavaScript is ES6/ES2015

- Major update van JavaScript als programmeertaal
- Modules, classes en meer
- Helpt bij het ontwikkelen in Angular 2

TypeScript breidt ES6 verder uit

- Annotaties & types
- Interfaces
- Compiler

TypeScript – tooling support

Types, Autocompletion.

Compile-time checking in editors.

Alles is *optioneel*. Je kunt altijd nog gewoon JavaScript gebruiken.

Onderdelen van een Component Class

imports

```
import { Component } from '@angular/core';
import { DataService } from './services/data-service';
```

annotations

```
@Component({
  selector: 'orders',
  directives: [DataService],
  templateUrl: 'orders-component.html',
})
```

class

```
export class OrdersComponent {
          …
}
```

Checkpoint

- Angular 2 is een totaal ander framework dan Angular 1
- Component-based vs. Page-based
- Nieuwe syntaxis
- Nieuwe programmeertalen en andere nieuwe kenmerken
- Concepten komen – grotendeels – overeen
- Veel boilerplate-code nodig voor een Quickstart
- Daarna: niet meer naar omkijken. Concentreren op de componenten