Rabobank

Angular Advanced
Introduction, Architecture

Peter Kassenaar
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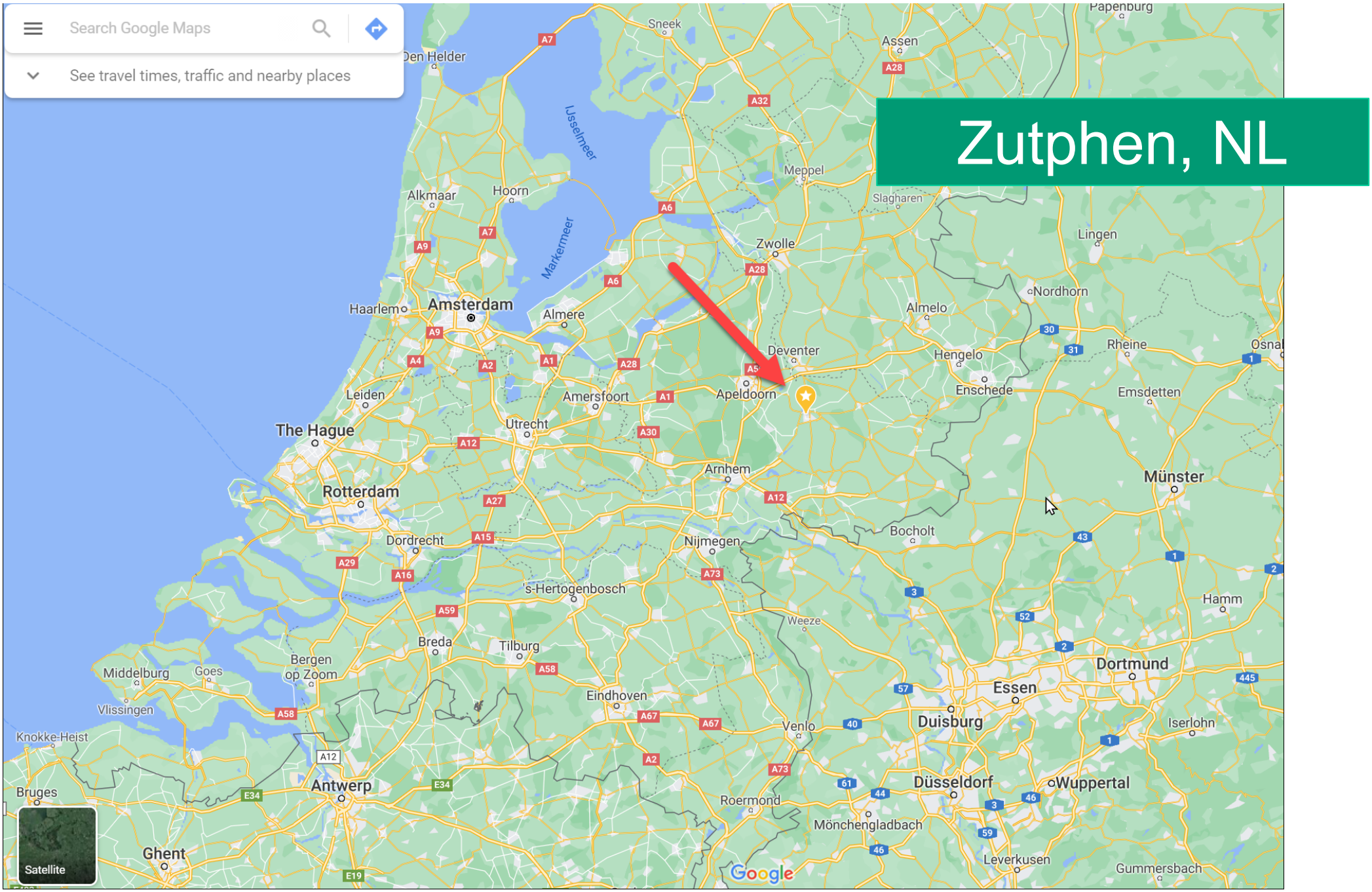
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Peter Kassenaar

- Trainer, author, developer – since 1996
- Specialty: *“Everything JavaScript”*
- JavaScript, ES6, Angular, NodeJS, TypeScript, jQuery, Vue.js, React

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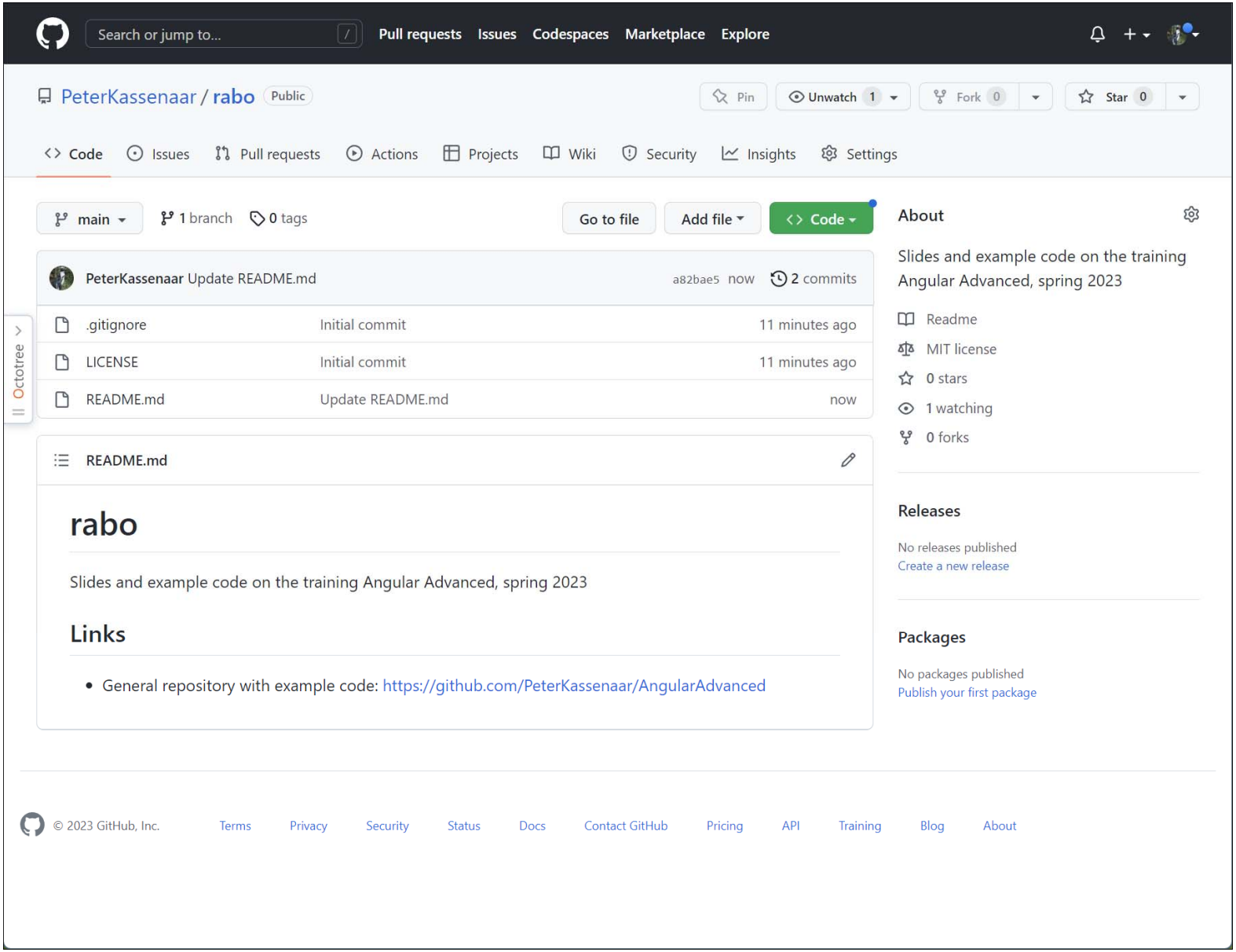
www.angulartraining.nl

github.com/PeterKassenaar/rabo



About you…

Introduce yourself shortly

Knowledge of Angular, (mobile/web-) apps?

How long have you worked with Angular yet?

Tell us a little bit about your projects.

What are your expectations of this course?

Agenda – 6, 7, 8 February 2023

~09:00 start – Morning session

~ 10:00, 11:00 Short Break

~12:00 Lunch

~12:45 Afternoon session

~ 14:00, 15:00 Break

~16:00-16:15 - end

Wednesday: if possible,
wrap up a bit early

Material

Software	(Angular + Editor + Browser + libraries)
Handouts	(PDF, Github)
Workshops	(in the presentations)
Websites	(online)

angular.io/

Short recap

- Assumed familiar: Fundamentals
  - Concepts, context & architecture
  - Angular CLI basics
  - Components, Data binding
  - Services
  - Live API’s
  - Component communication / event buses
  - Routing
    - Basics
    - Routing Parameters

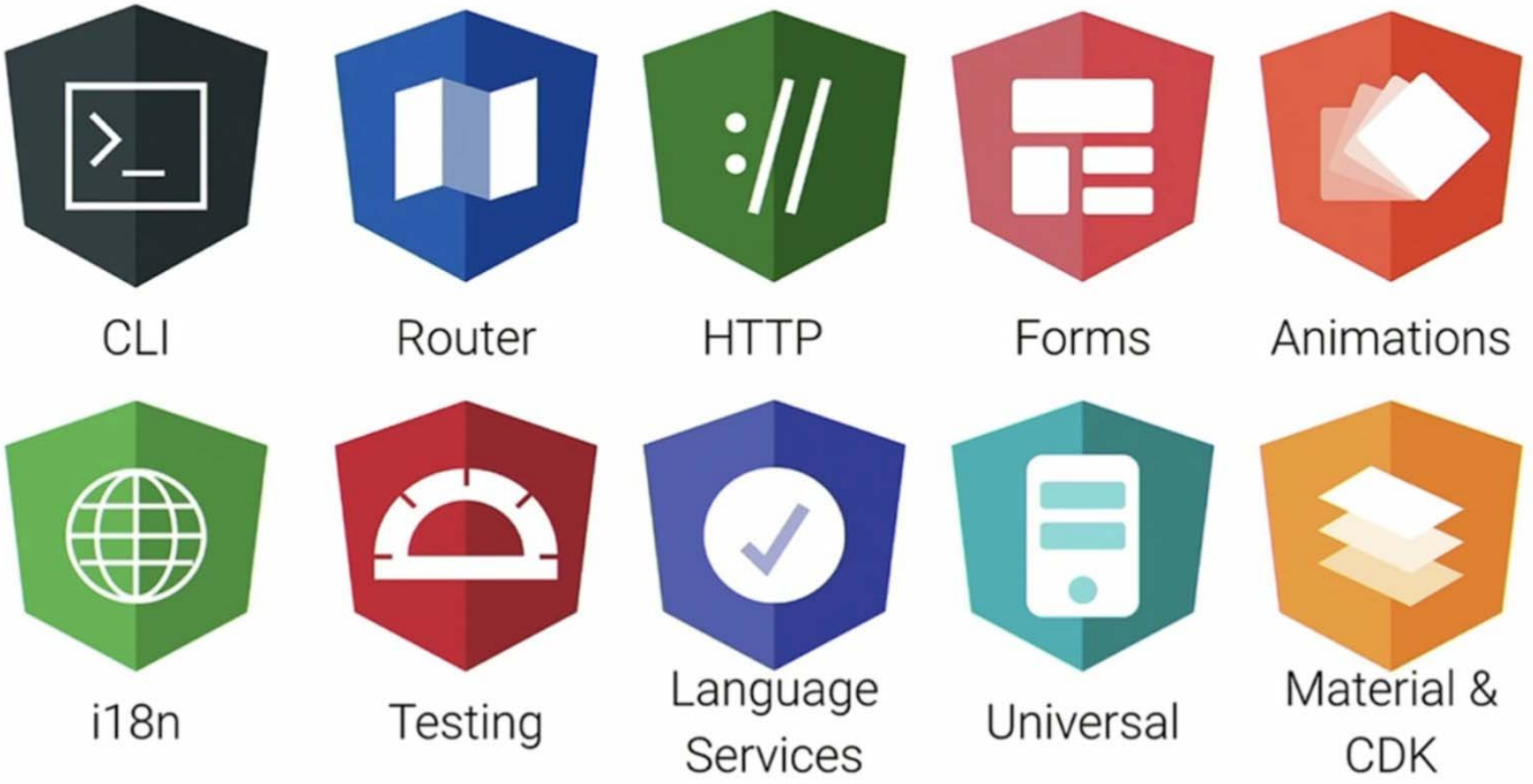
“Advanced”

Broadening?

or…

deepening?

Why devs and enterprises like Angular…



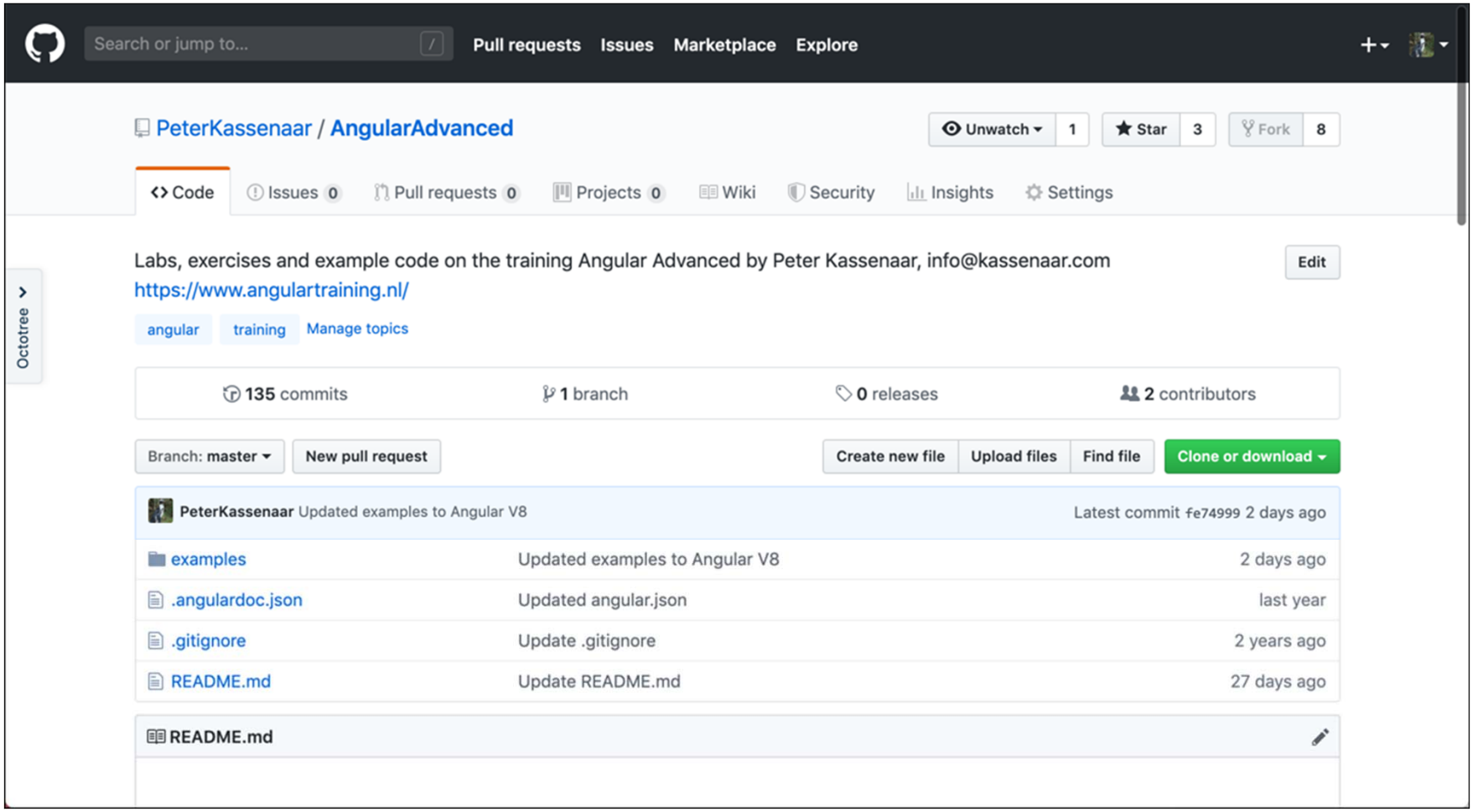
Agenda - 3 days - Thematic

- Day 1: Architecture
  - Angular CLI (tips & tricks)
  - Composing Applications with multiple modules
  - Routing and lazy loading modules
    - Loading Strategies
  - Advanced components: Smart/View ~, Dynamic ~
- Day 2: Store & Observables
  - Creating observables from scratch using RxJS, (un)subscribing, operators
  - Introduction - @ngrx/store
  - Concepts, State, Action, Reducer, Dispatcher, Effect, Http

Agenda - 3 days- Thematic

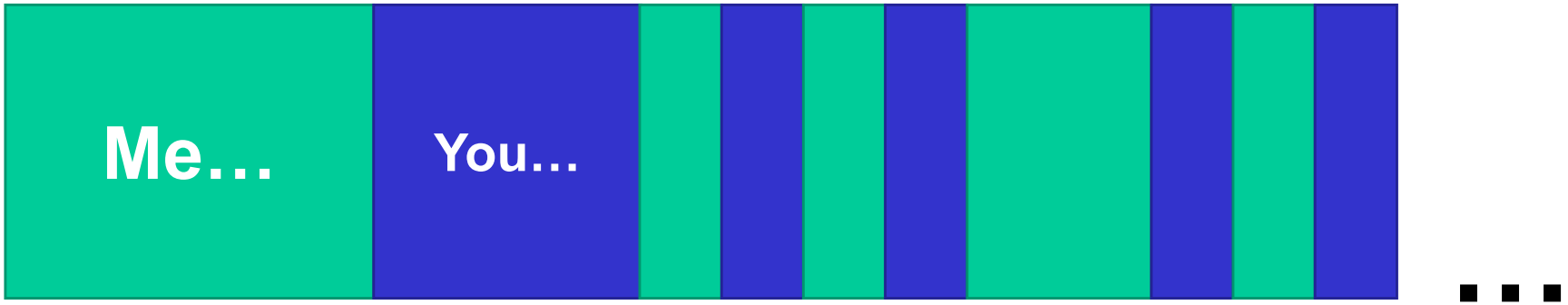
- Day 3: Miscellaneous
  - Unit testing
  - Dynamic Forms
  - Angular monorepo's / micro frontends?
  - Publishing Angular libraries to NPM
  - More on Angular Schematics
  - Your turn : Q & A, specific issues
  - …
- Overall : Best practices on coding & architecture

Generic ‘Advanced’ Github repo



https://github.com/PeterKassenaar/AngularAdvanced

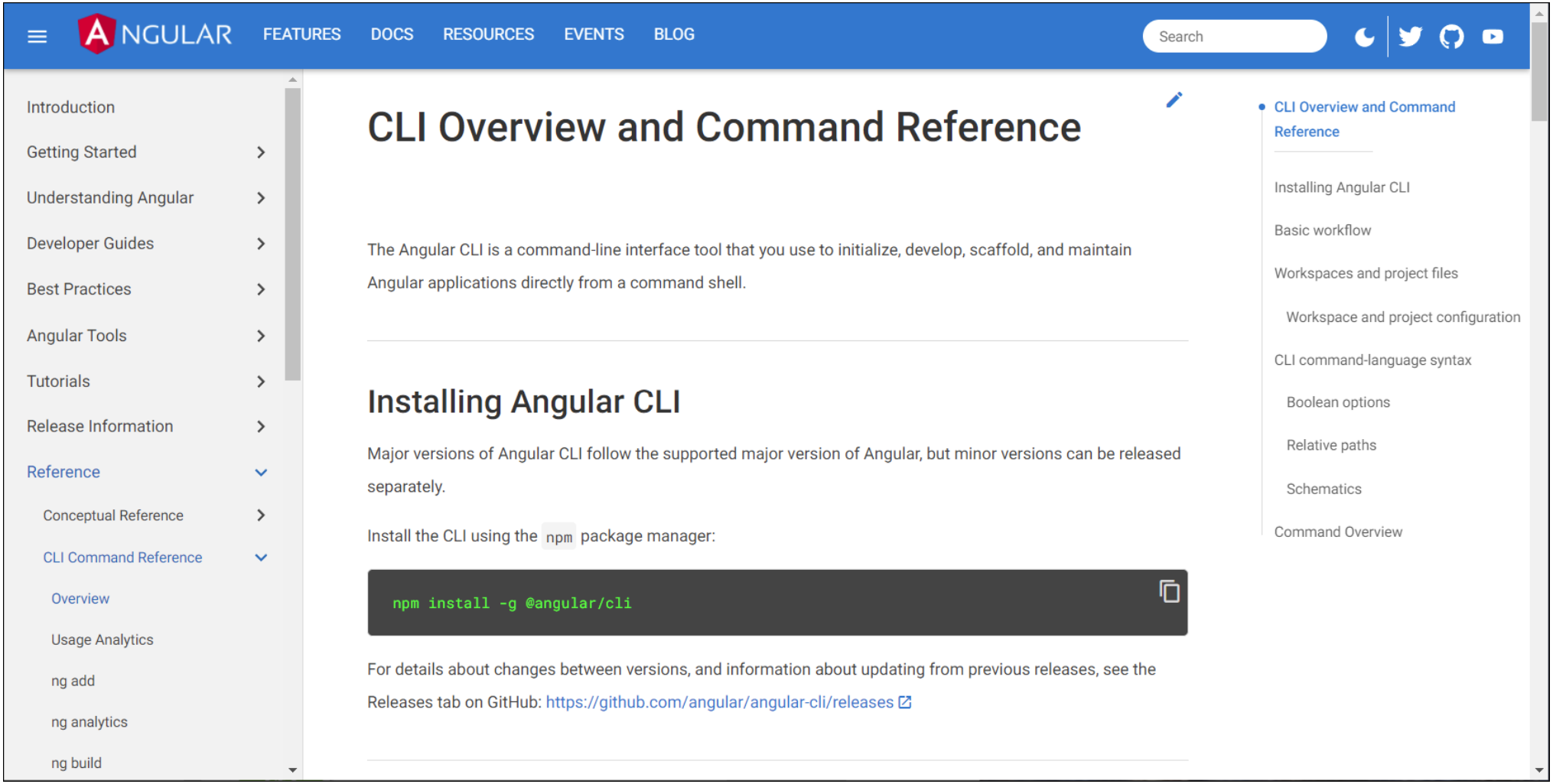
Overall process



Questions?

Angular CLI

Scaffold new projects, modules, components via command line...



https://angular.io/cli

We'll be using Angular-CLI this course

- It *is* possible to configure your Angular app by hand
- Using the CLI it's much simpler.
- CLI-options:
  - Scaffolding
  - Generating
  - Testing
  - Building
  - AOT-Compiling
  - ...

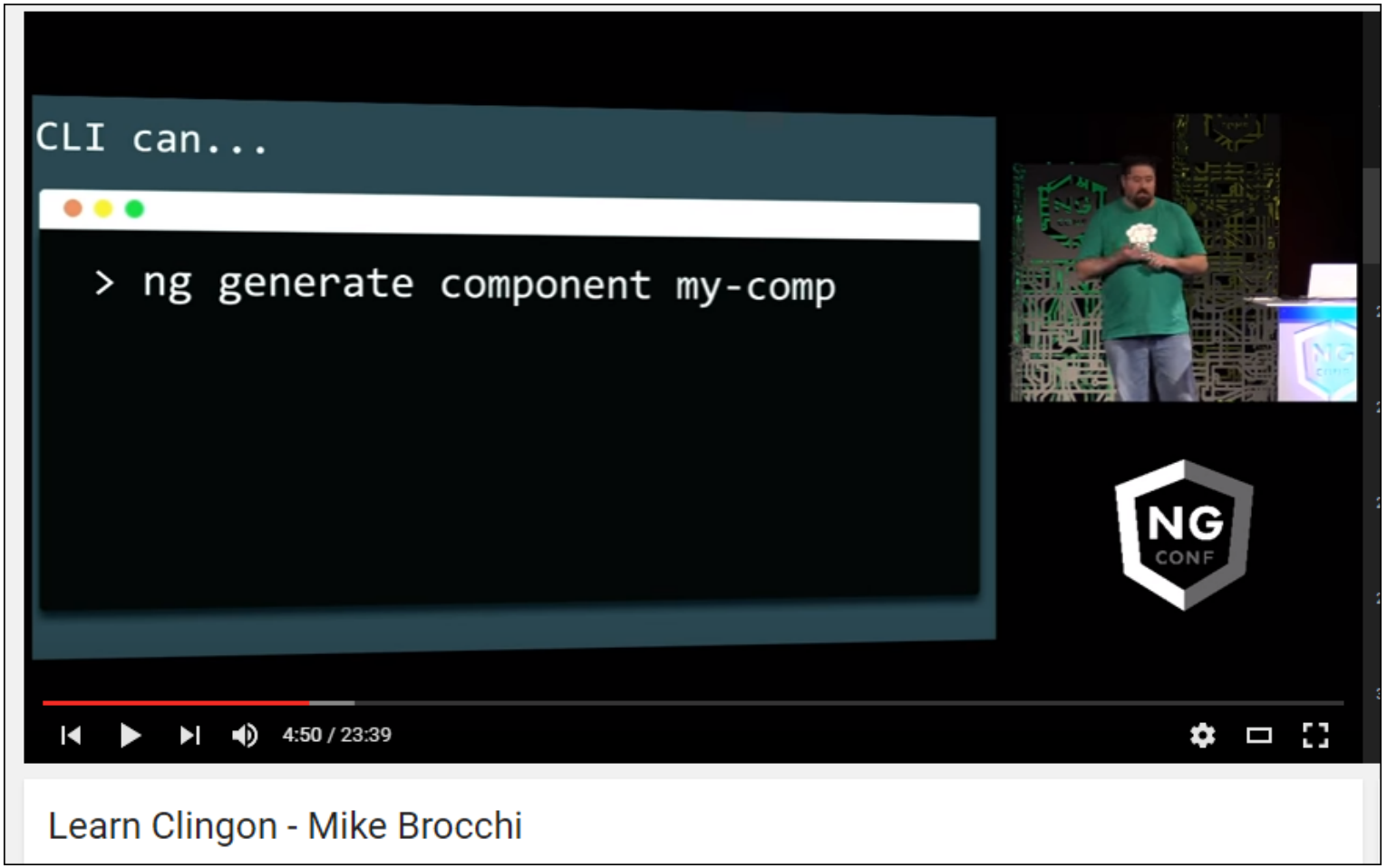
https://cli.angular.io

Install globally

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

CLI is also installed locally in project

```
npm start [--options]
```



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

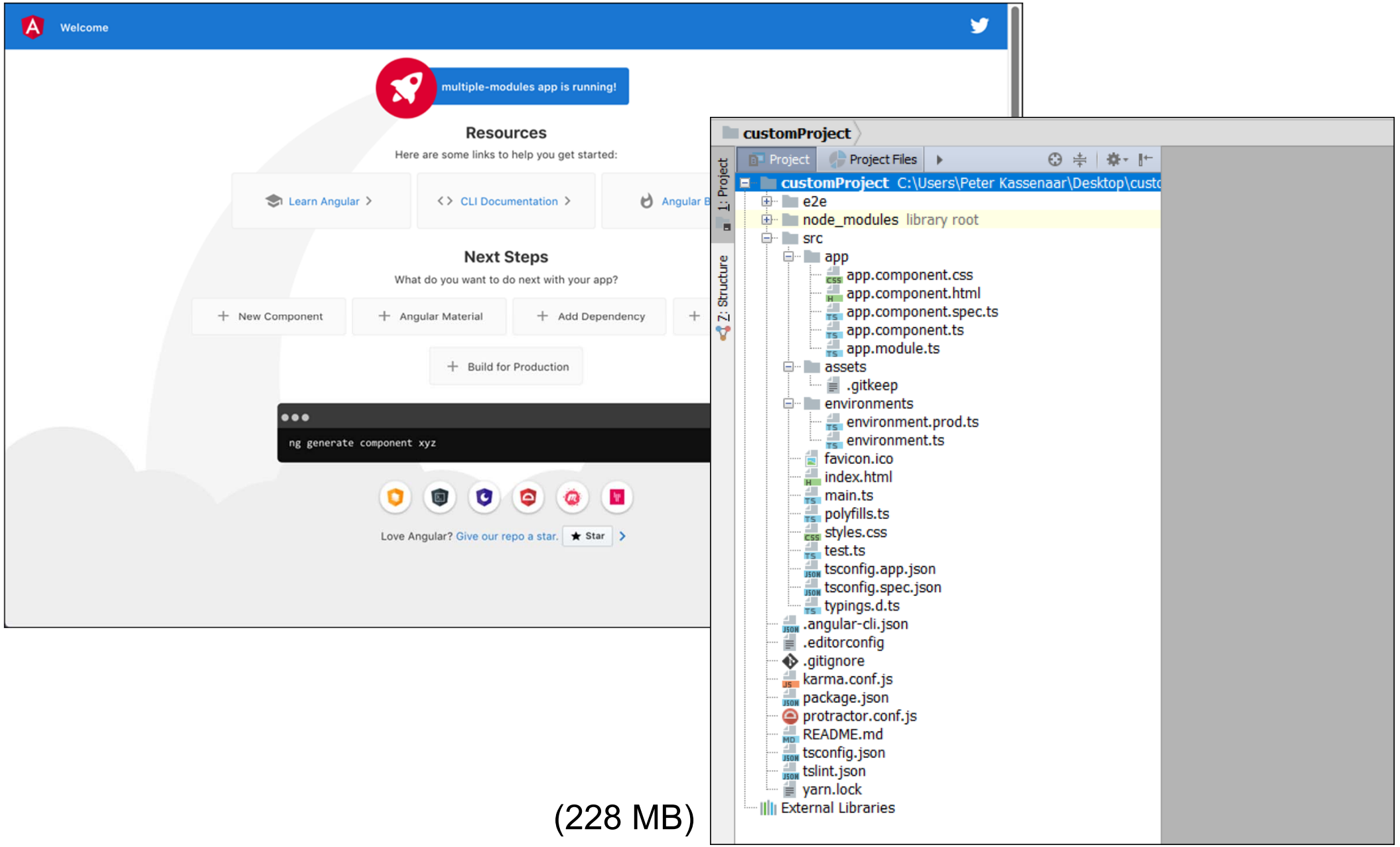
Main commands

ng new – create basic app

```
ng new PROJECT_NAME
cd PROJECT_NAME
ng serve // global command, npm start for local command
```

Project is served on `http://localhost:4200`

Default application



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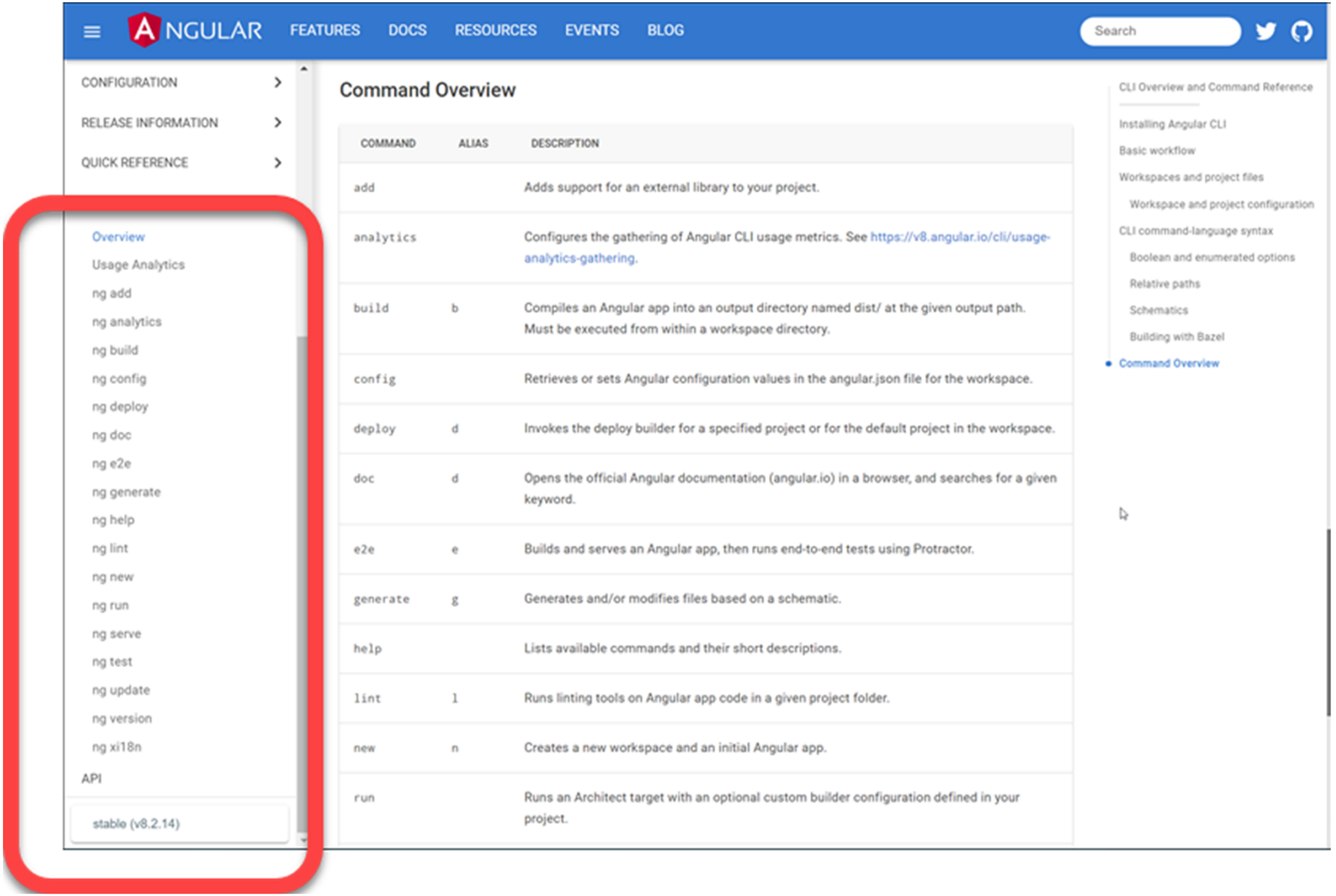
Some CLI tips & tricks

- `ng serve --open` Directly open the compiled project in the browser
- `ng serve --port 4300` Serve project on different port
- `ng serve --ssl` Serve using `https://`
- `ng serve --live-reload false` Do not use live reload
- `ng serve --help` Overview of all other options

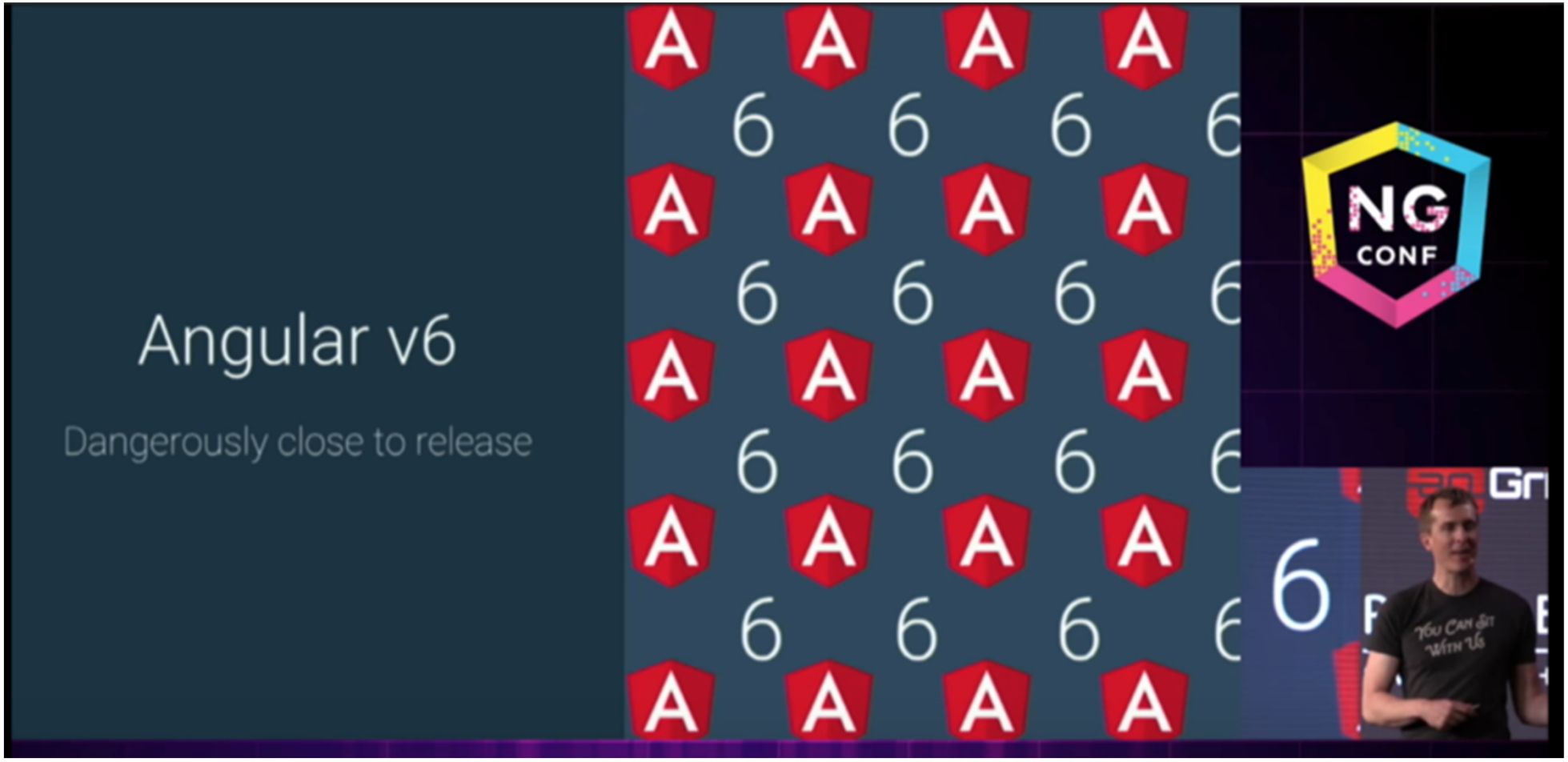
More ng tooling

- `ng generate <blueprint> --dry-run` Do not write output files
- `ng generate <blueprint> --skip-tests` Do not write spec.ts file
- `ng generate module <name> --routing` add routing to new module

Lots (!) of options

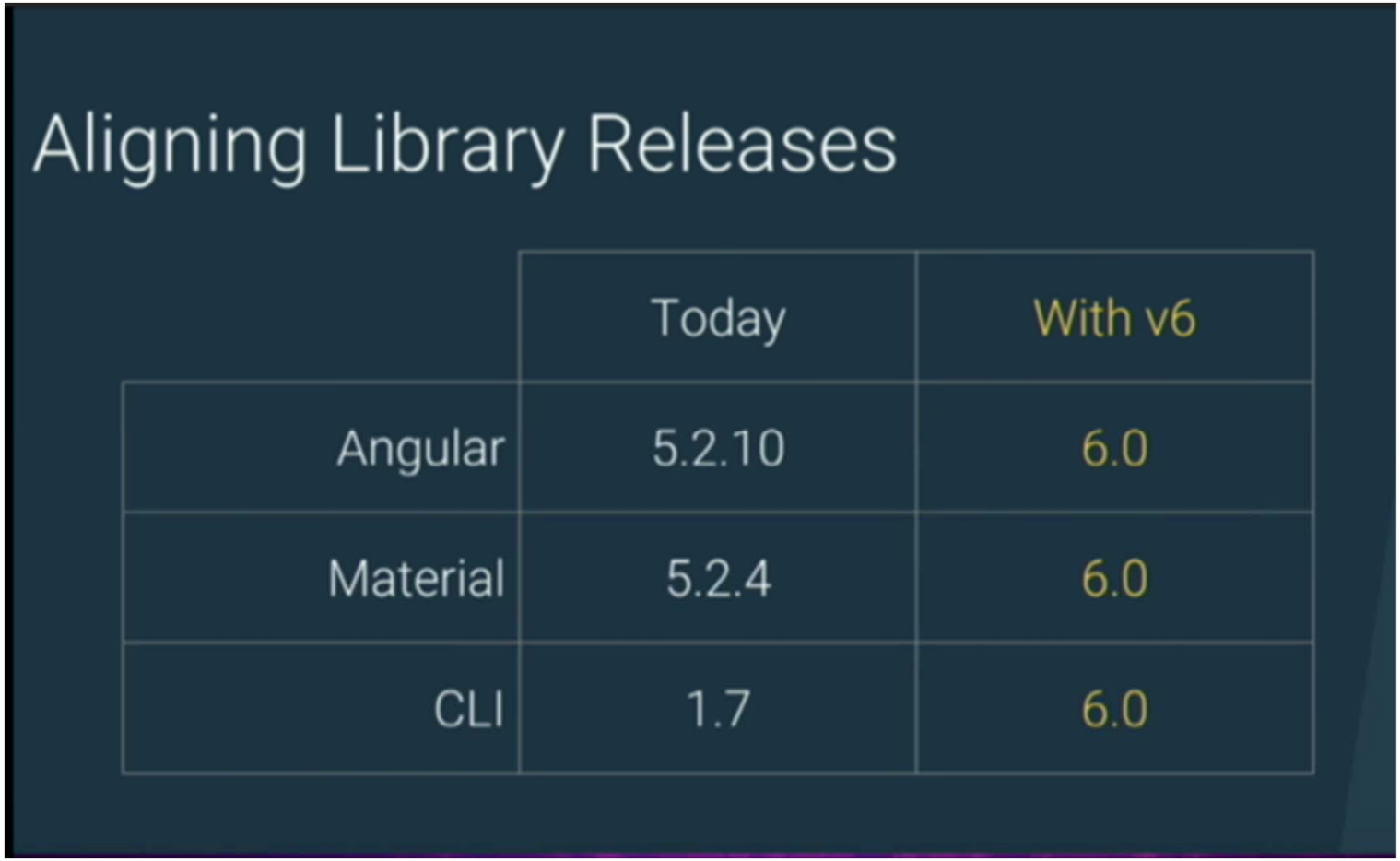


Angular CLI – modern version (May 2018)

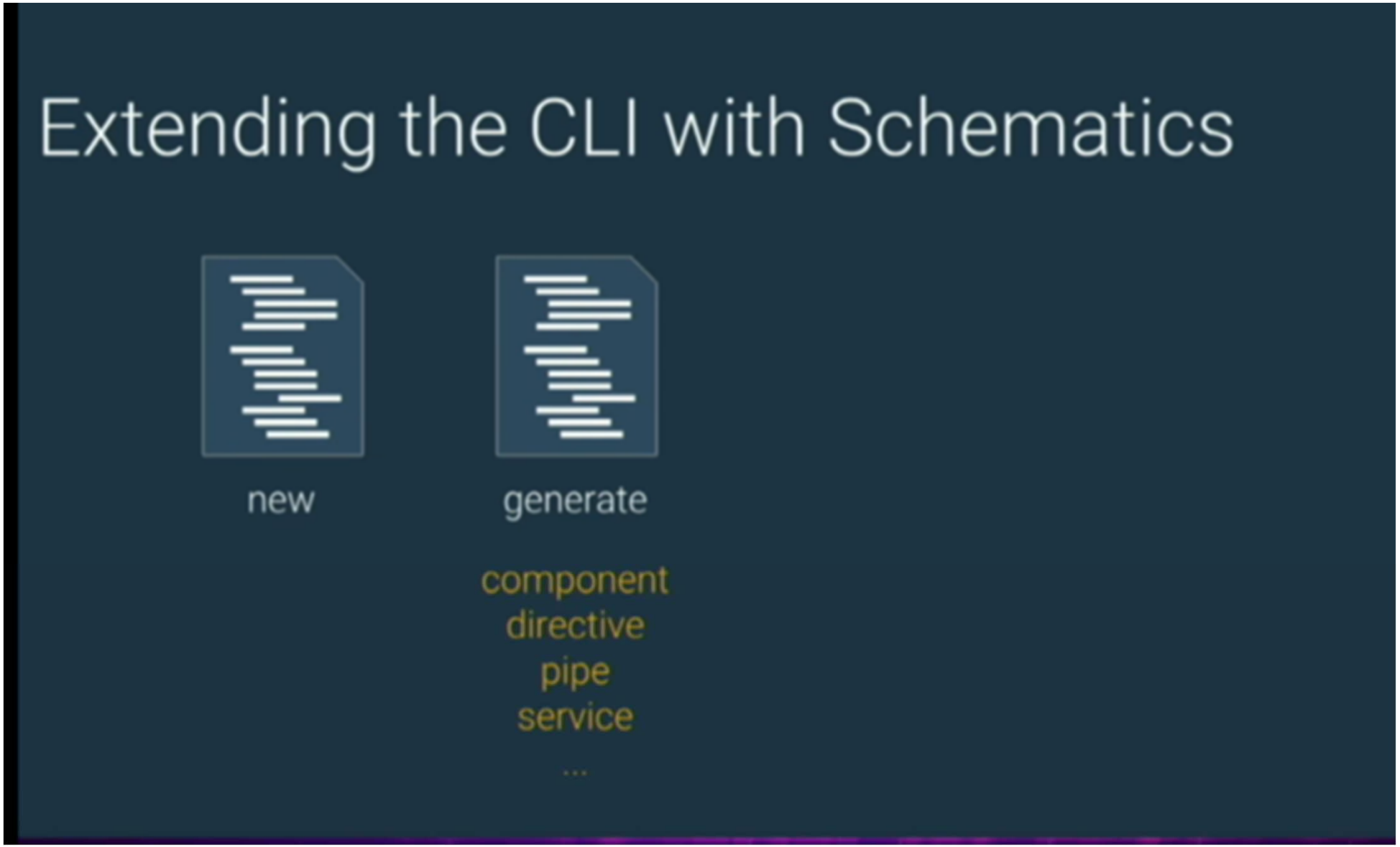


https://www.youtube.com/watch?v=dIxknqPOWms

About version numbering



New CLI Options



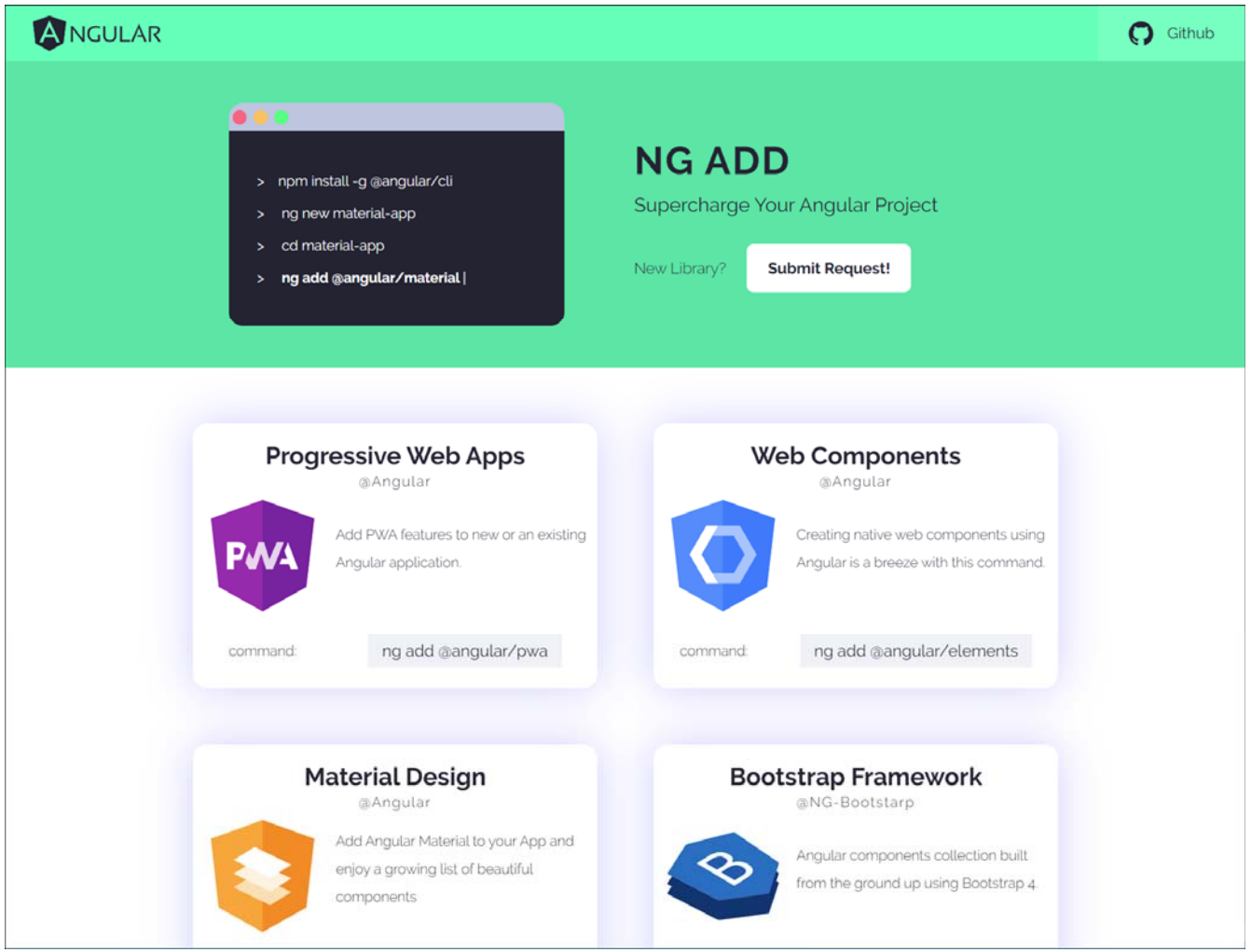
Extending the CLI with Schematics

component
directive
pipe
service
...

Info on the Angular CLI keynote

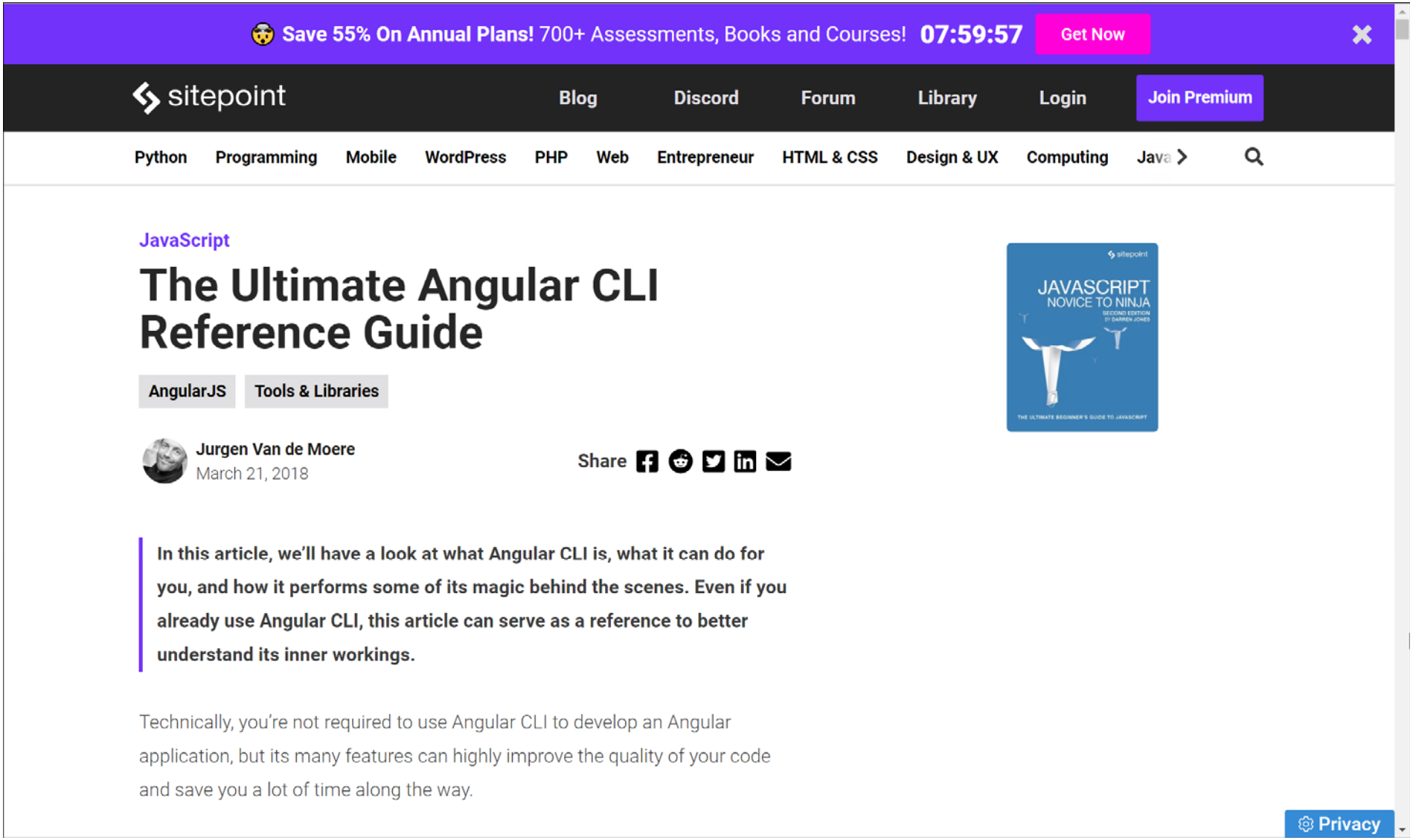
https://www.youtube.com/watch?v=dIxknqPOWms

Ng add overview



https://ng-add.web.app/

If you want to learn more - background information

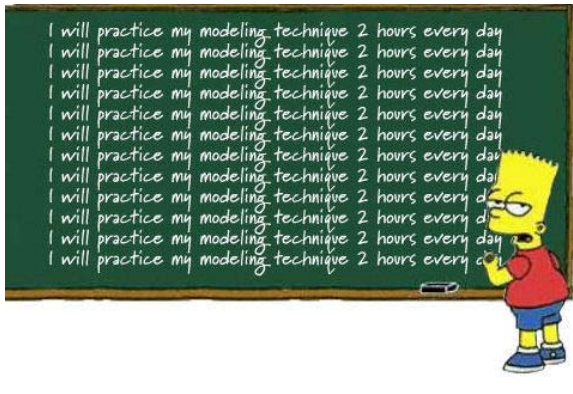


https://www.sitepoint.com/ultimate-angular-cli-reference/

Mini Workshop

- Generate a new, blank project with Angular CLI
- Generate a new component or a new service with it
- Add some new CLI packages, using `ng add` for instance
  - `@angular/material`
  - `ngx-bootstrap` (https://valor-software.com/ngx-bootstrap/#/)
  - See how/where they are installed
  - What files are affected?
  - https://ng-add.web.app/
- Study some additional CLI/ ng commands at https://angular.io/cli

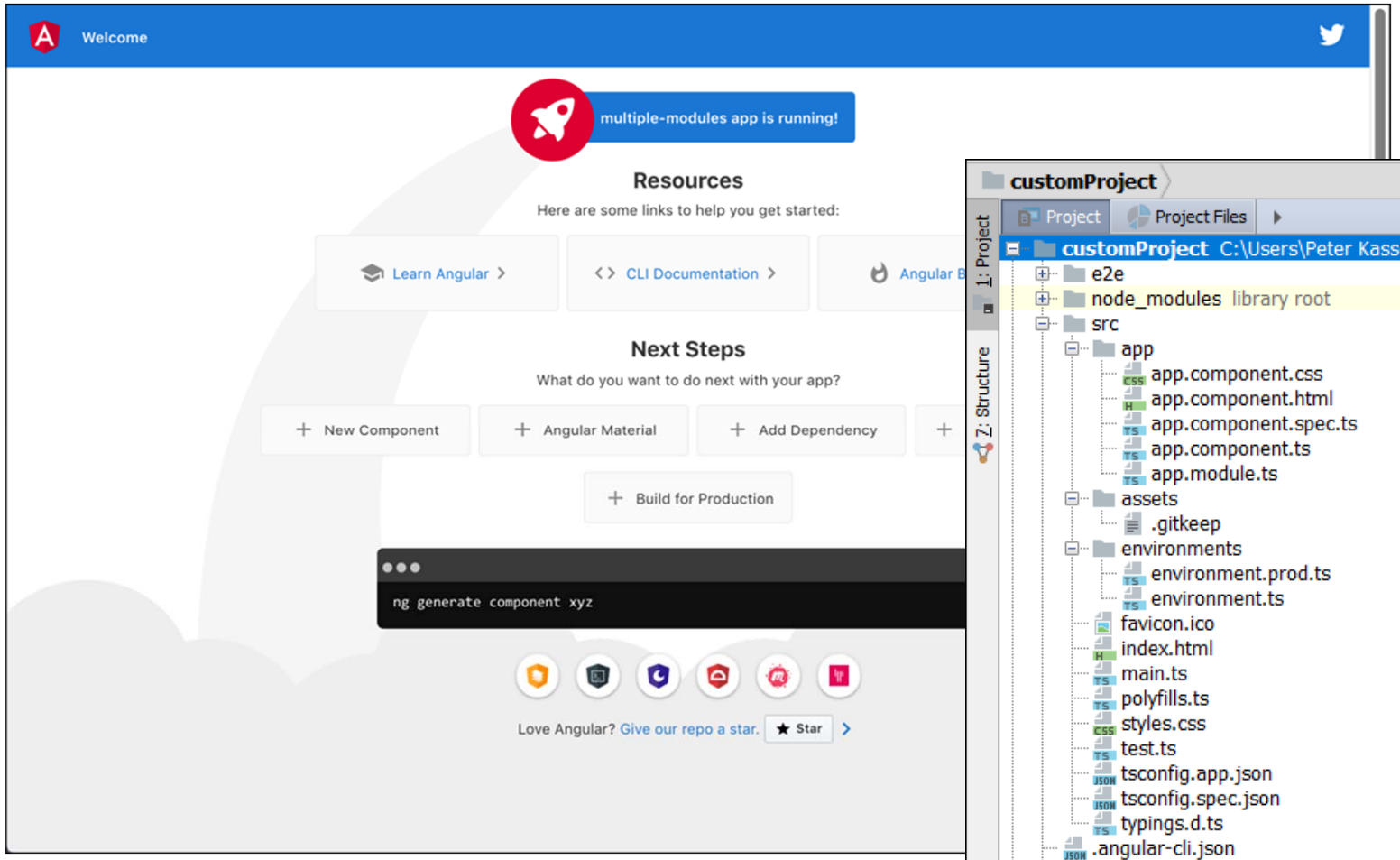
  For instance:
  - What can you generate with `ng generate`?
  - What options are available to `ng build`?
  - What other commands do seem useful to you?

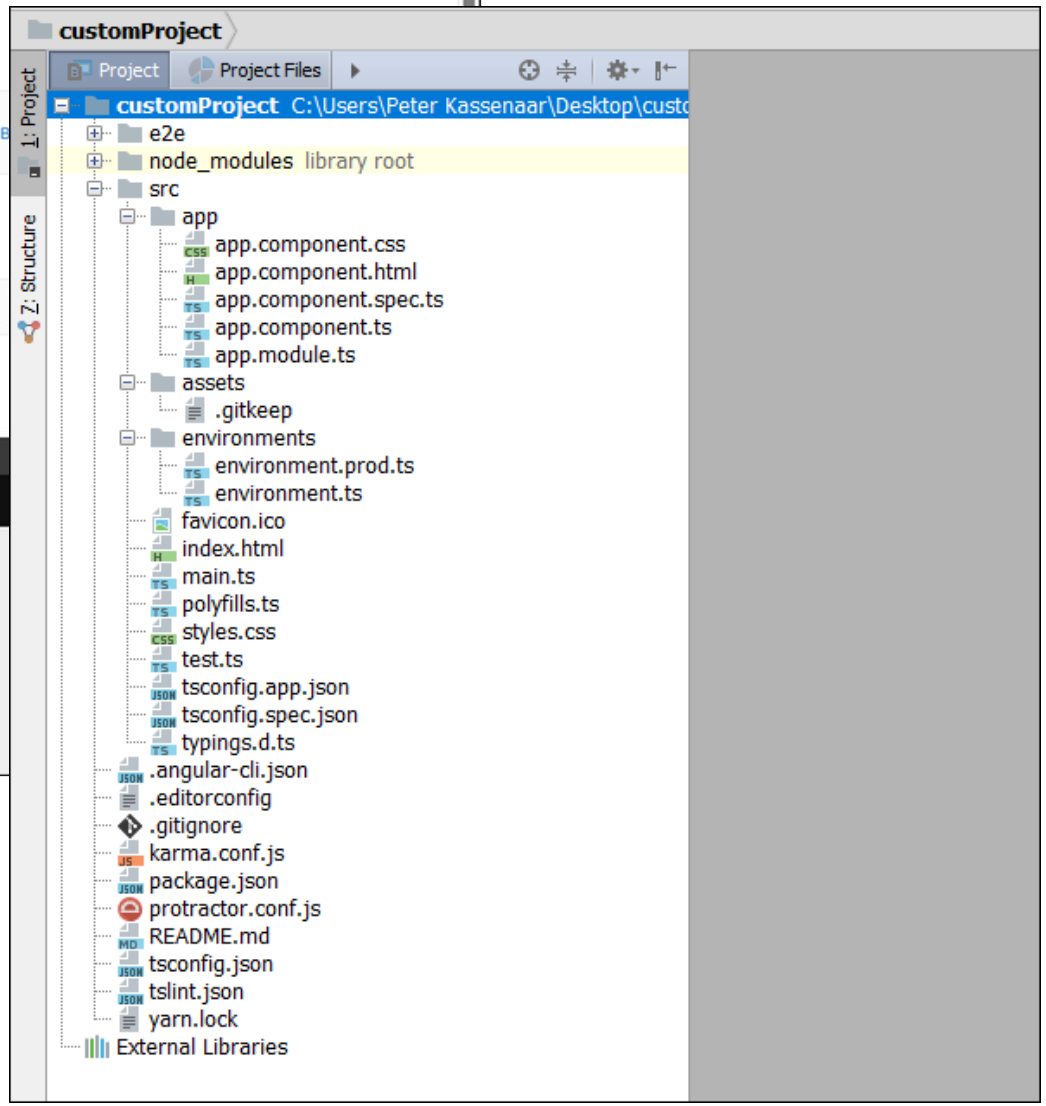


Multiple modules

Splitting your application into separate, reusable modules

Default application – 1 module





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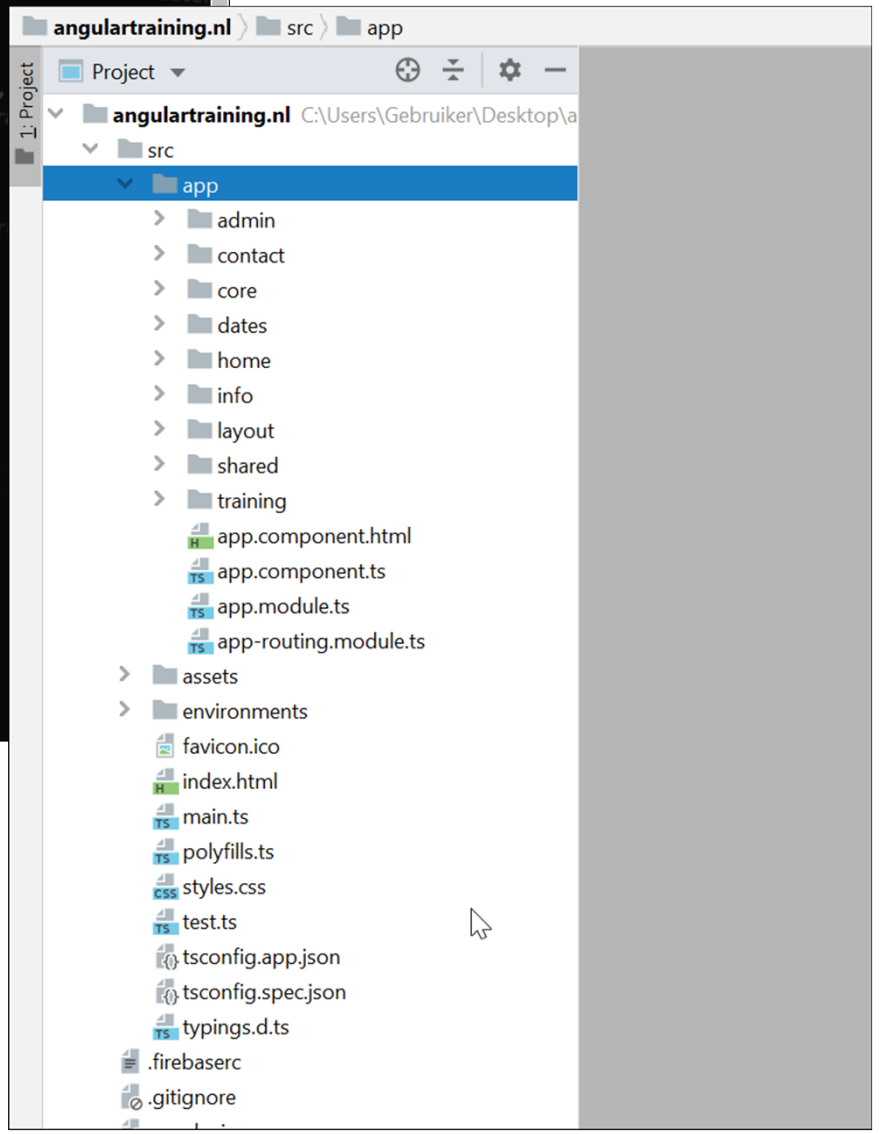
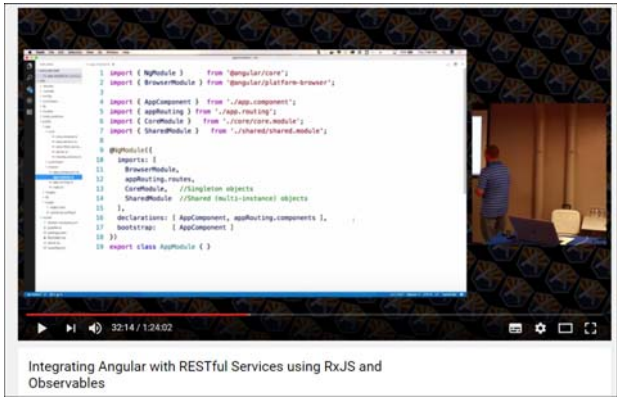
Bigger applications – multiple modules



Angular Modules - naming

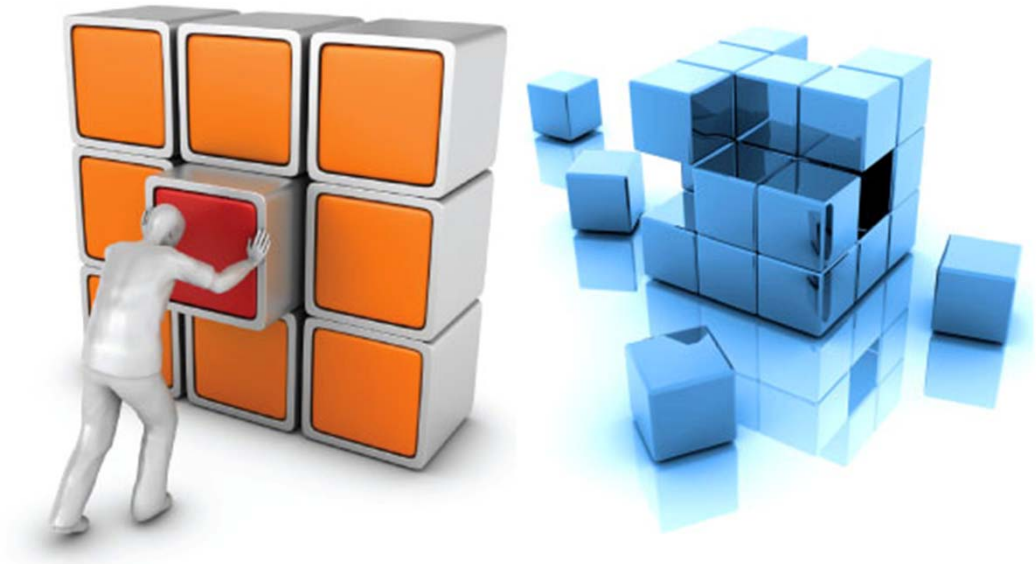
- Divide your app into *logical* and often *reusable* pieces of code
- Keyword : code organization

- Use one `AppModule` - the root of your app
- Use one `CoreModule` - containing all *singletons* in your app
- Use one `SharedModule` - containing all shared resources, possible multiple instances
- Use additional modules *per feature*
- https://www.youtube.com/watch?v=YxK4UW4UfCk



Application – multiple Modules – why?

- *Reuse* of Components, Pipes, Routes and Services etc. over different apps
- *Wrap* each set of logical related components, services, etc. in its own module.

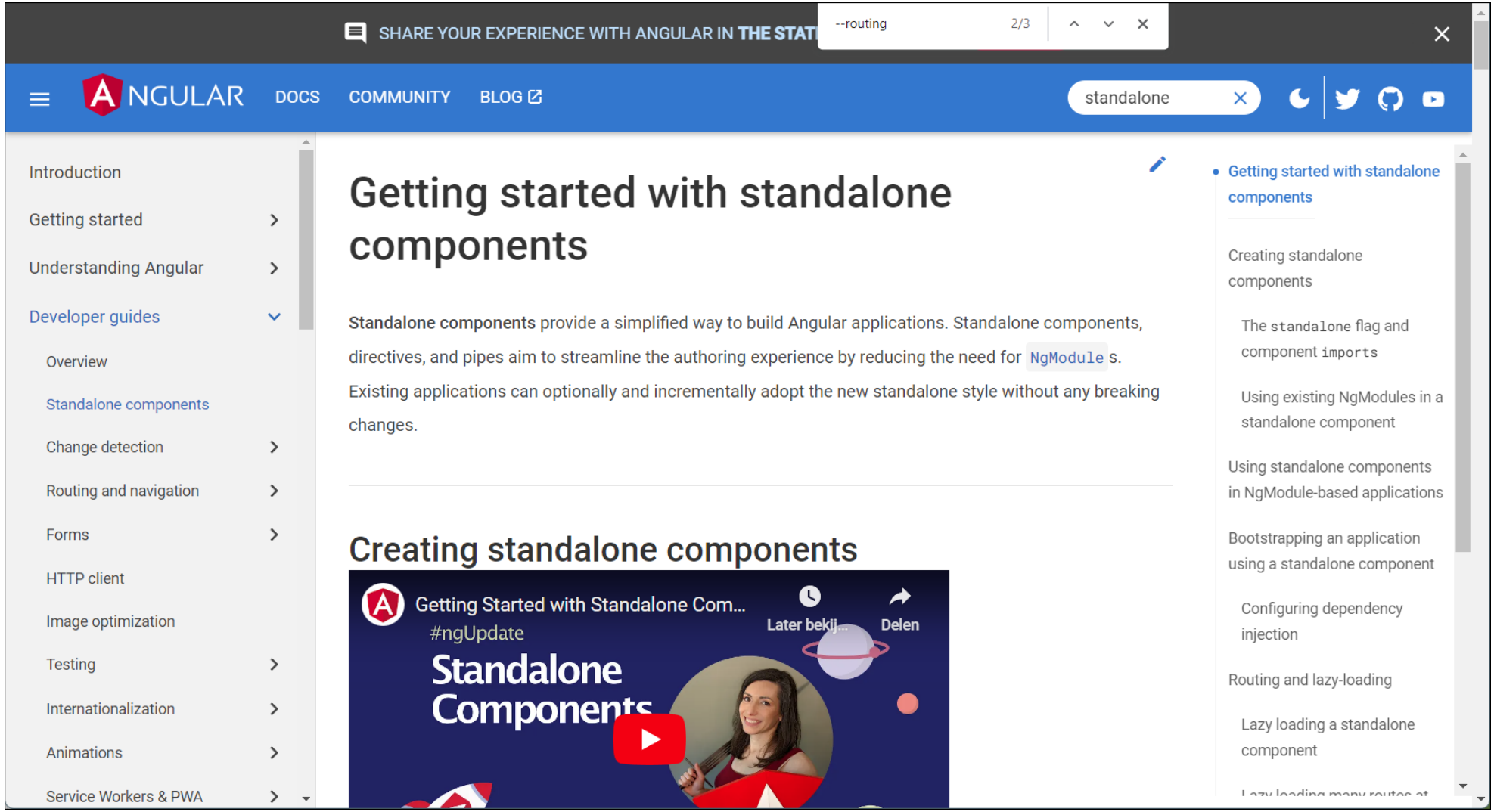


Since Angular 15 – Standalone Components

- Applications and components without an `ngModule`

"Standalone components provide a simplified way to build Angular applications. Standalone components, directives, and pipes aim to streamline the authoring experience by reducing the need for `NgModules`. Existing applications can optionally and incrementally adopt the new standalone style without any breaking changes."

More info on standalone components



https://angular.io/guide/standalone-components

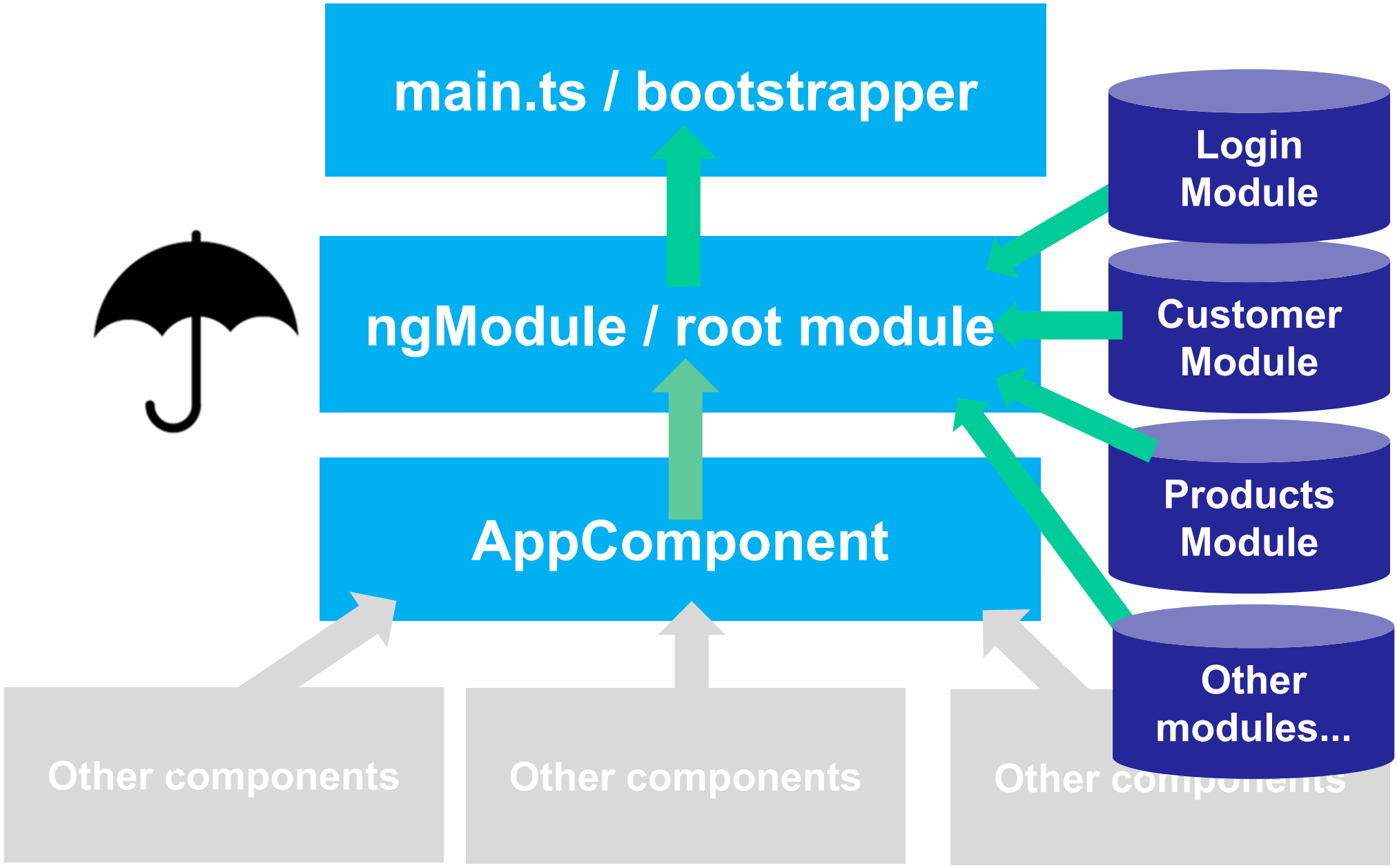
Verdict (personal, opinion!)

We're NOT using standalone components in this course

- Standalone components might come in handy, in new applications from scratch
- Due to confusion, personally I don't see it implemented *'optionally and incrementally'* in existing apps
- It is mostly done (IMO) to mimic Vue, React et all.

But, if you want more information…

- https://blog.angular.io/angular-v15-is-now-available-df7be7f2f4c8
- https://www.angulararchitects.io/aktuelles/angulars-future-without-ngmodules-lightweight-solutions-on-top-of-standalone-components/
- https://netbasal.com/angular-standalone-components-welcome-to-a-world-without-ngmodule-abd3963e89c5


main.ts / bootstrapper
ngModule / root module
AppComponent
Login Module
Customer Module
Products Module
Other modules...
Other components
Other components
Other components

Steps

1. Create a new module
   - Optional: test first with `--dry-run`
   - `ng generate module customers --dry-run`
2. Create component(s) inside that module
   - Again: test first with `--dry-run`
   - `ng generate component customers --module customers --dry-run`
3. Apply UI, logic, etc. to your component
4. Export your component inside `customers.module.ts`
   - `exports : [CustomersComponent],`
   - Otherwise it can’t be used in other components!
5. Provide new module to `app.module.ts`
   - `imports: [CustomersModule]`

Optional : SharedModule

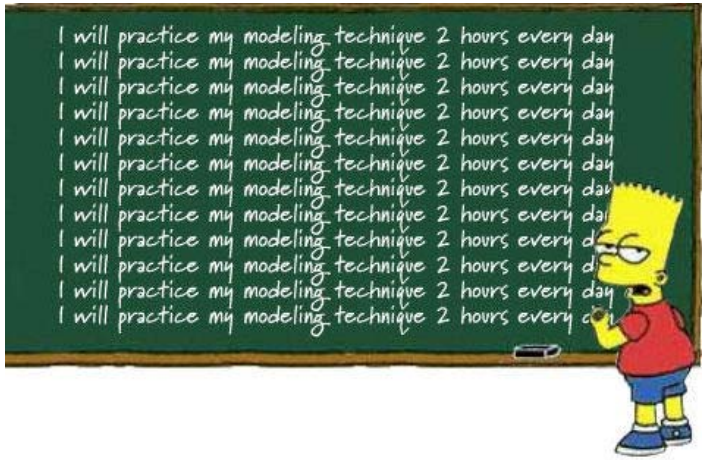
- Reuse components in multiple modules? Use a `SharedModule`
  - `ng g m shared` – shorthand notation
- Create components inside `SharedModule`
- Import `SharedModule` in other modules
- It doesn't have to be in `AppModule` if you don't use it directly!
- It *does* not add size to module bundles


Demo

Workshop

- Open `../100-multiple modules` (`npm install`, `npm start`)
- Create a new module
- Create a new component inside this new module and give it some UI.
- Include the module in the Main Module and show it besides other modules
- Include the Search Component in your own module

- *OR:*
- Add Multiple Modules from scratch to your own application, using the steps described in this module.



How to structure feature modules

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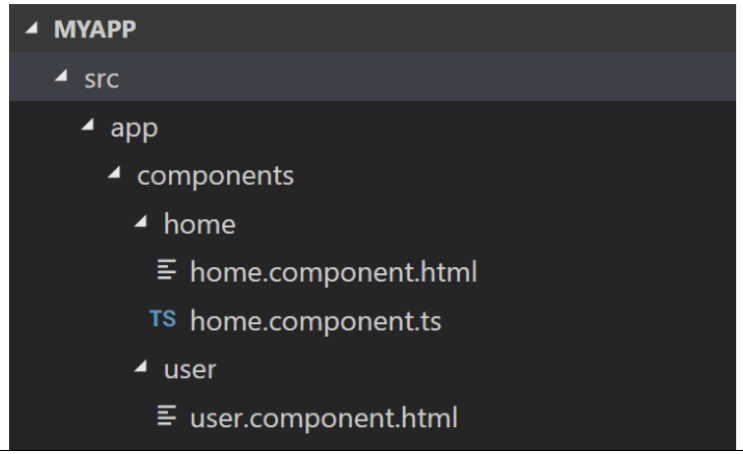
Why and how to structure Features in Modules in Angular

This might sound pretty basic, but I encounter these challenges over and over in customer projects and it's still an ongoing discussion internally.

A central project goal in a recent Angular project was to design features and UI components for reusability. To achieve this, we need to make sure our code is well isolated and has a simple and clear dependency model.

Prologue: Feature vs. Technical Project Structure

When building small apps and looking at common code samples in the internet a lot of devs (including myself) tend to come up with a project structure like this:



https://medium.com/@philippbauknecht/why-and-how-to-structure-features-in-modules-in-angular-d5602c6436be