

Intro Into Angular

The Next Web

Gerhard Boer

RECONCEPT_

Topics

Why Angular

Batteries included

Opinionated

Actively maintained

Validated by Google

Tools

TypeScript

CLI

Concepts

Component Tree

Components

Template Syntax

Dependency Injection



Deliver web apps
with confidence

The web development framework for building the future

WORKS AT ANY SCALE

LOVED BY MILLIONS

BUILD FOR EVERYONE

Angular - “Batteries Included”



Animations



Material



CDK



Forms



Http



Routing



i18n



PWA



Universal



Language
Service

Angular - Opinionated

“The Angular™ way of doing things”



Angular - Actively maintained & improved

New major version every 6 months

Actively supported versions

The following table provides the status for Angular versions under support.

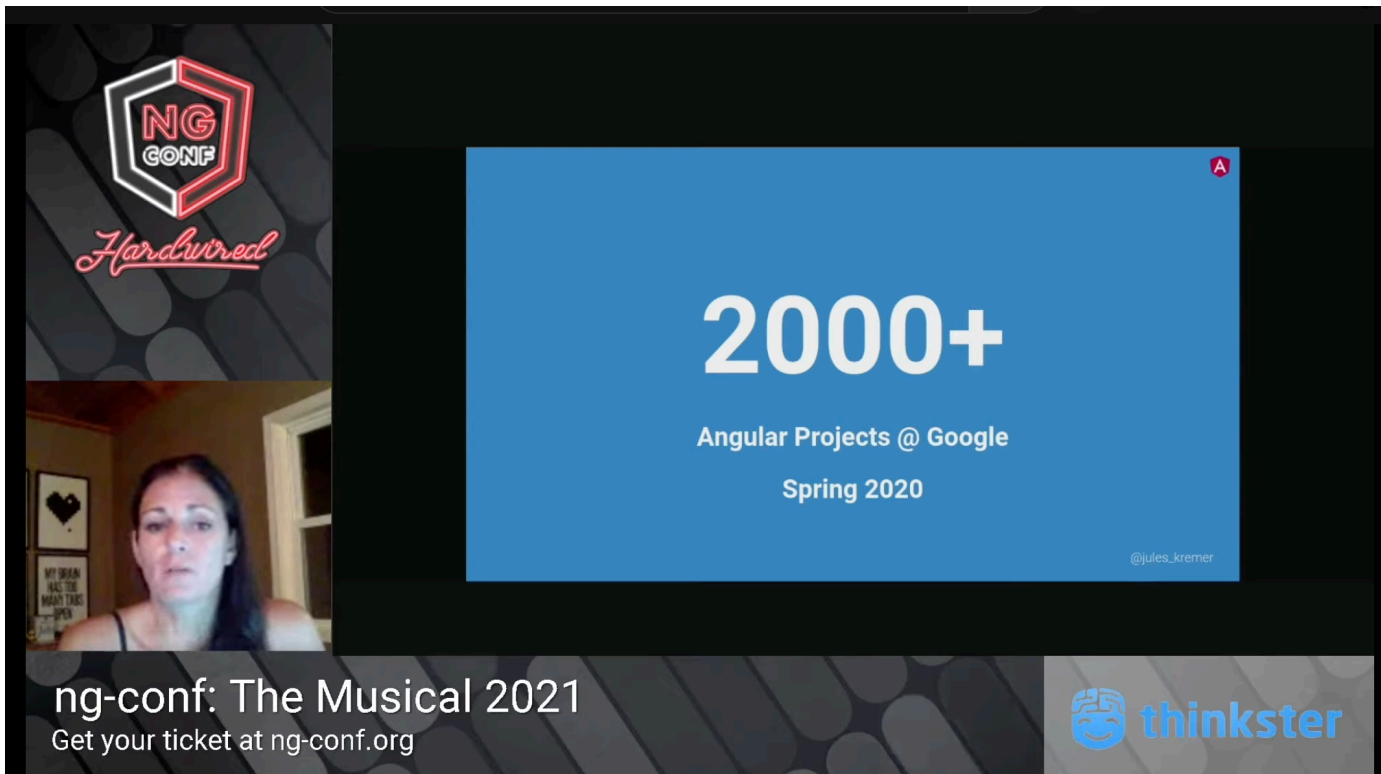
VERSION	STATUS	RELEASED	ACTIVE ENDS	LTS ENDS
^15.0.0	Active	2022-11-18	2023-05-18	2024-05-18
^14.0.0	LTS	2022-06-02	2022-11-18	2023-11-18
^13.0.0	LTS	2021-11-04	2022-06-02	2023-05-04

Angular - Actively maintained & improved

Migrations are handled by the tooling



Angular - Validated by Google



The image is a screenshot of a video presentation. On the left side, there is a vertical strip containing two images: the top one is the 'NG CONF' logo with 'Hardwired' written in a red script below it, and the bottom one is a video feed of a woman with dark hair. The main part of the screen is a large blue rectangle with the text '2000+' in large white font, followed by 'Angular Projects @ Google' and 'Spring 2020' in smaller white font. A small '@jules_kremer' handle is visible in the bottom right of the blue area. At the bottom of the video frame, there is a dark grey banner with the text 'ng-conf: The Musical 2021' and 'Get your ticket at ng-conf.org' on the left, and the 'thinkster' logo on the right.

NG CONF
Hardwired

2000+

Angular Projects @ Google
Spring 2020

@jules_kremer

ng-conf: The Musical 2021
Get your ticket at ng-conf.org

thinkster

<https://www.youtube.com/watch?v=Uz2D8QjQAIE>

Angular Pitfalls

Steeper learning curve than others

Relatively 'heavy'

Verbose

“Only” a framework



Angular Language & Tools



TypeScript



Angular CLI

TypeScript

Extension on JavaScript

Code “Description”

Types

Interfaces

```
let digit: number = "hello";
```

```
TS2322: Type 'string' is not assignable to type 'number'.
```

TypeScript

<https://www.typescriptlang.org/play>

- basic types
- validation
- custom types
- autocomplete
- any

Angular CLI

Run from Terminal

Create Project

Start Project

Run tests

Make Builds

Generate new parts

```
gerhard@Gerhards-MBP-2 tmp % ng new my-angular-app --standalone
Node.js version v19.4.0 detected.
Odd numbered Node.js versions will not enter LTS status and should not be used for production. For more information, please see https://nodejs.org/en/about/releases/.
? Would you like to add Angular routing? Yes
? Which stylesheet format would you like to use? SCSS [ https://sass-lang.com/documentation/syntax#scss
]
Standalone application structure is new and not yet supported by many existing 'ng add' and 'ng update' integrations with community libraries.
CREATE my-angular-app/README.md (1066 bytes)
CREATE my-angular-app/.editorconfig (274 bytes)
CREATE my-angular-app/.gitignore (548 bytes)
CREATE my-angular-app/angular.json (3105 bytes)
CREATE my-angular-app/package.json (1045 bytes)
CREATE my-angular-app/tsconfig.json (901 bytes)
CREATE my-angular-app/tsconfig.app.json (263 bytes)
CREATE my-angular-app/tsconfig.spec.json (273 bytes)
CREATE my-angular-app/.vscode/extensions.json (130 bytes)
CREATE my-angular-app/.vscode/launch.json (470 bytes)
CREATE my-angular-app/.vscode/tasks.json (938 bytes)
CREATE my-angular-app/src/main.ts (250 bytes)
CREATE my-angular-app/src/favicon.ico (1642 bytes)
CREATE my-angular-app/src/index.html (298 bytes)
CREATE my-angular-app/src/styles.scss (80 bytes)
CREATE my-angular-app/src/app/app.component.scss (0 bytes)
CREATE my-angular-app/src/app/app.component.html (23115 bytes)
CREATE my-angular-app/src/app/app.component.spec.ts (912 bytes)
CREATE my-angular-app/src/app/app.component.ts (376 bytes)
CREATE my-angular-app/src/app/app.config.ts (228 bytes)
CREATE my-angular-app/src/app/app.routes.ts (77 bytes)
CREATE my-angular-app/src/assets/.gitkeep (0 bytes)
: Installing packages (npm)...
```

Angular CLI - let's do it

install the angular cli globally

create new application (ng new --standalone)

start the application

generate a new component

run the tests

create a build



<https://github.com/reconcept-developers/intro-into-angular-assignments/>

Angular Concepts

Angular Concepts

Component Tree

@Components

Template Syntax

Dependency Injection



Component Tree

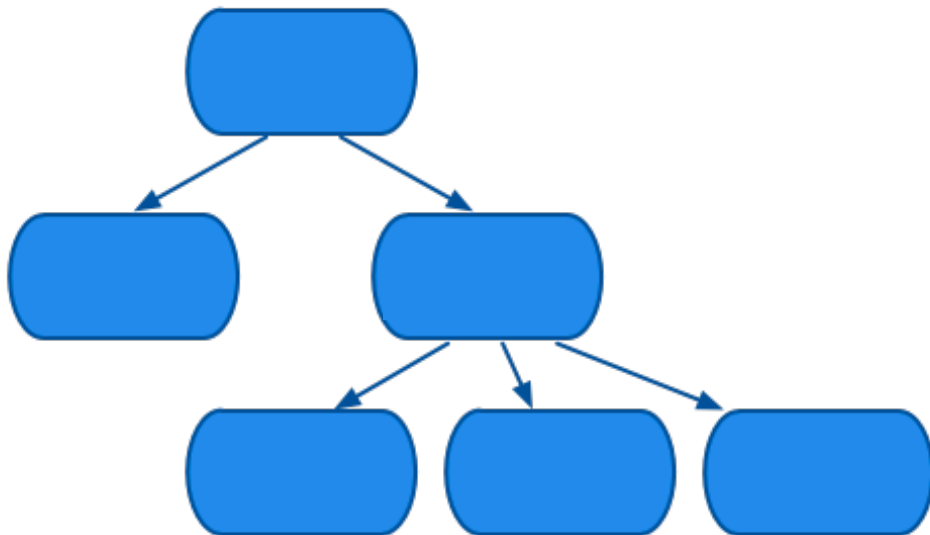
How the entire application is structured
in code

runtime in the browser

Component Communication

Change Detection

Injection Contexts (more later)



Component Tree

Results for angular

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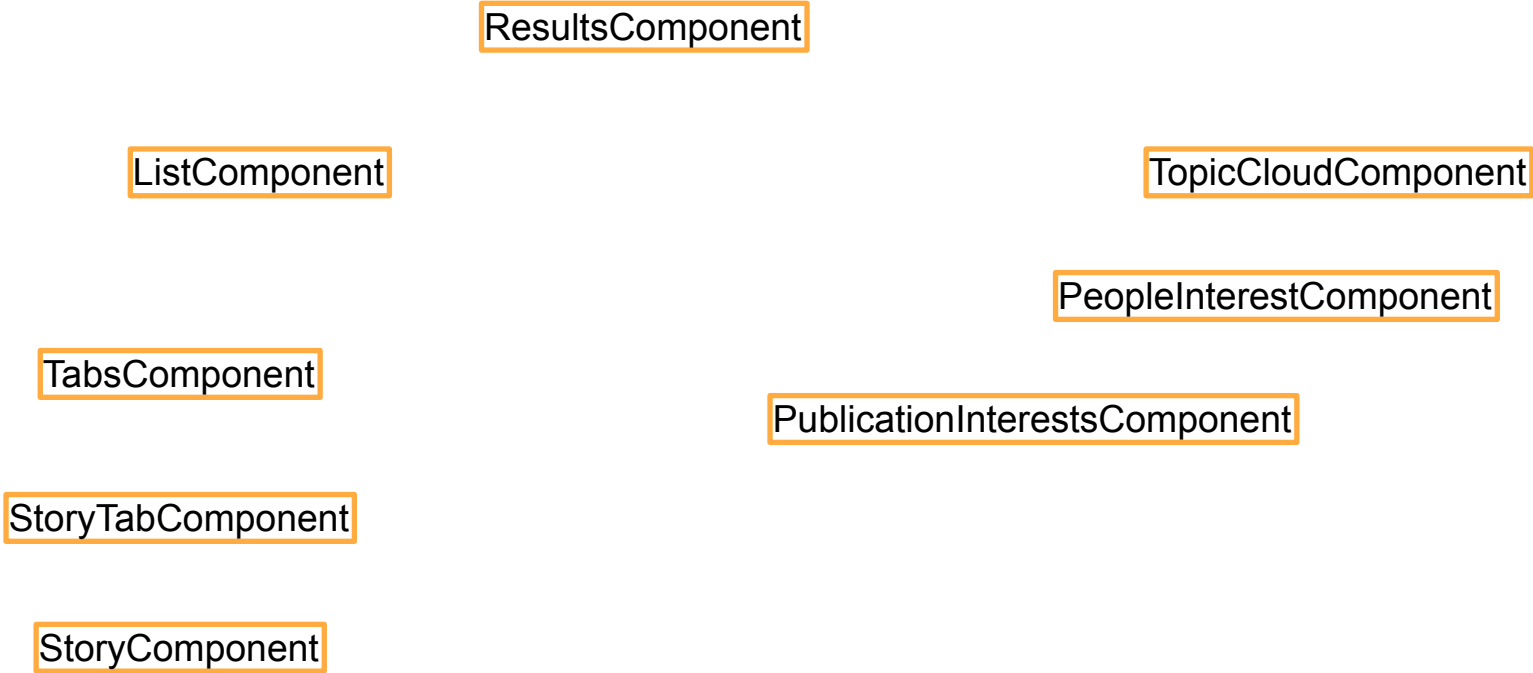
StoryComponent

TopicCloudComponent

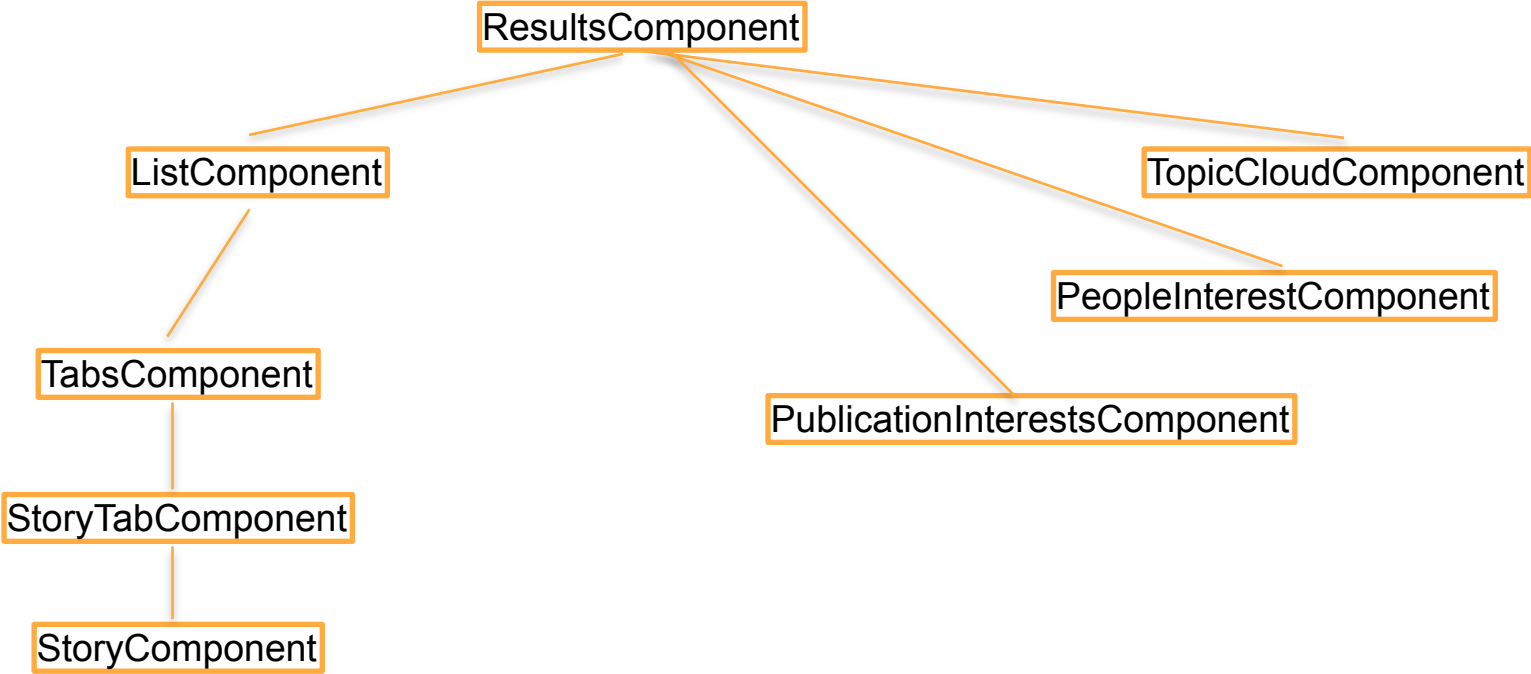
PeopleInterestComponent

PublicationInterestsComponent

Component Tree



Component Tree



Component Tree

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```
graph TD
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    ResultsComponent --> TopicCloudComponent
    ResultsComponent --> PeopleInterestComponent
    ResultsComponent --> PublicationInterestsComponent
    ListComponent --> TabsComponent
    ListComponent --> StoryTabComponent
    StoryTabComponent --> StoryComponent
```

Component Tree - Let's do it

Choose a (simple) webpage and try to extract a Component Tree

or try “<https://tweakers.net/smartphones/vergelijken/>”

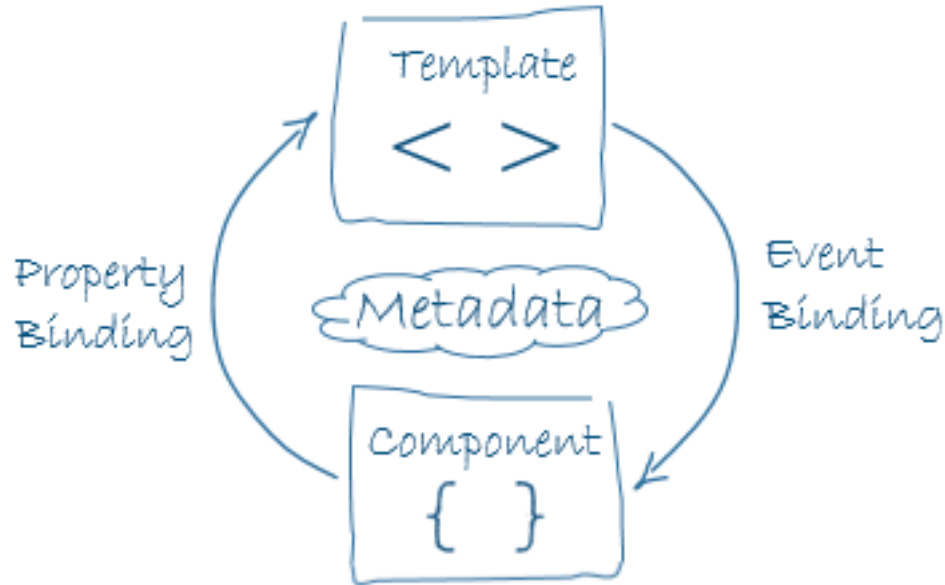
helpful tools

- draw.io
- your own favourite tool

Components

Component

Combines TypeScript code with HTML template (&styling)



<https://angular.io/guide/architecture-components>

Component

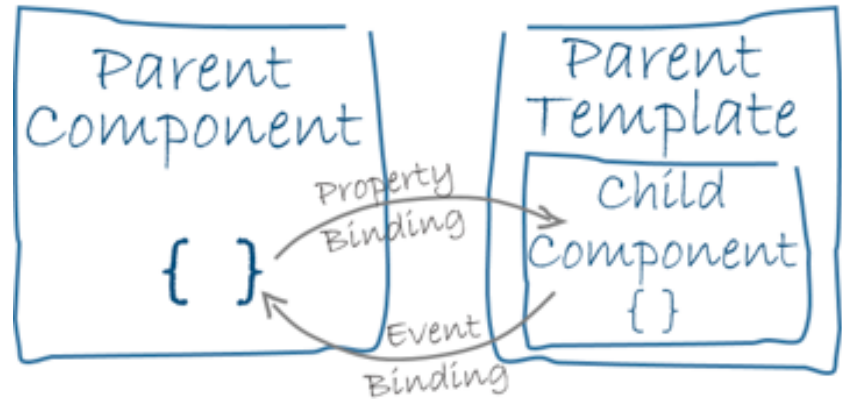
Controlled by framework

imports

@Inputs / []

@Outputs / ()

Lifecycle methods



<https://angular.io/guide/architecture-components>

Component

@Component *decorator*

```
@Component({  
  selector: 'app-todo',  
  templateUrl: './todo.component.html',  
  styleUrls: ['./todo.component.scss'],  
  imports: [CommonModule],  
  standalone: true,  
})  
  
export class TodoComponent { }
```

Component

@Component *inputs & outputs*

```
@Component({selector: 'app-todo'...})
export class TodoComponent {

  @Input({required: true}) todo!: Todo;

  @Output() selectTodo = new EventEmitter<Todo>();

}
```


Component

@Component *Lifecycle methods*

```
@Component({ })  
export class TodoComponent implements OnInit, OnChanges {  
  
  ngOnInit() { /* called when the component is created */ }  
  
  ngOnChanges() { /* called when an input changes */ }  
  
}
```

Component

Use of TodoComponent in parent

```
@Component({
  selector: 'app-todo-list',
  template: `
    <app-todo [todo]="todo" (selectTodo)="toggleTodo($event)"/>
  `,
  styleUrls: ['./todo-list.component.scss'],
  standalone: true,
  imports: [CommonModule, TodoComponent],
})
export class TodoListComponent {...}
```

Template Syntax

Connect Component Code in Template

`{{ interpolation }}`

`()` events

`[]` property setters

```
<span
  [class.strike]="todo.done"
  (click)="selectTodo.emit(todo)">
  {{ todo.label }}
</span>
```

Template Syntax

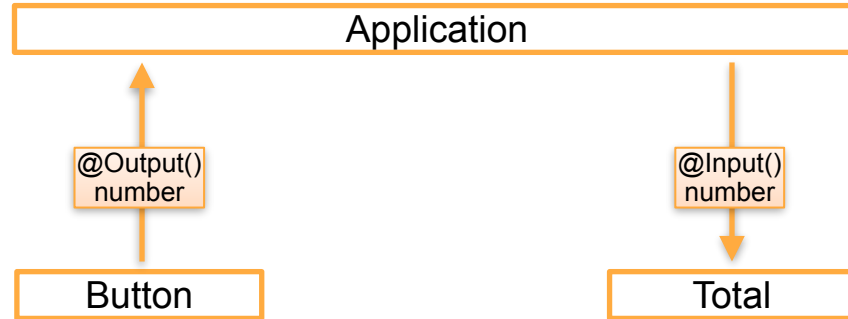
Directives

***ngFor**

***ngIf**

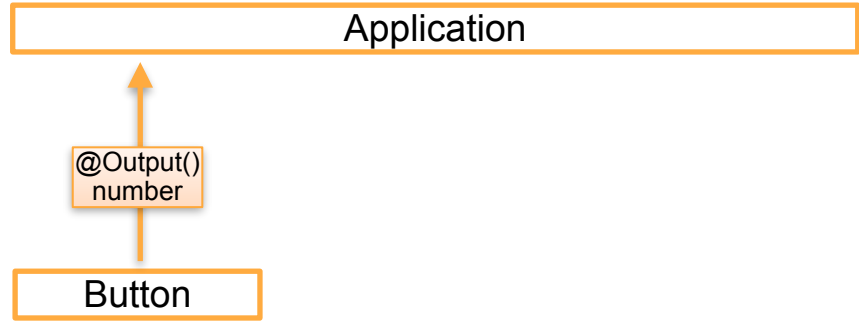
```
<ul *ngIf="todos.length > 0">  
  <li *ngFor="let todo of todos">  
    <span> {{ todo.label }} </span>  
  </li>  
</ul>
```

Component & Template Syntax Demo



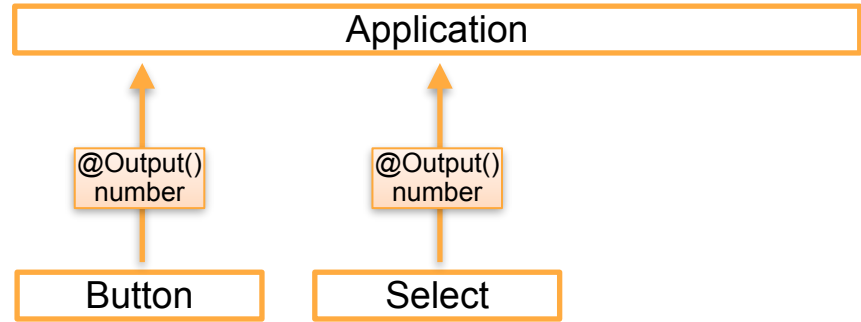
Component & Template Syntax - Lets do it

1. generate a new component
2. use component in AppComponent
3. add component property containing a number
4. show component property value in template
5. add 2 buttons: increment & decrement
6. when user clicks on increment, add 1 to the component property
7. when user clicks on decrement, subtract 1 of the component property



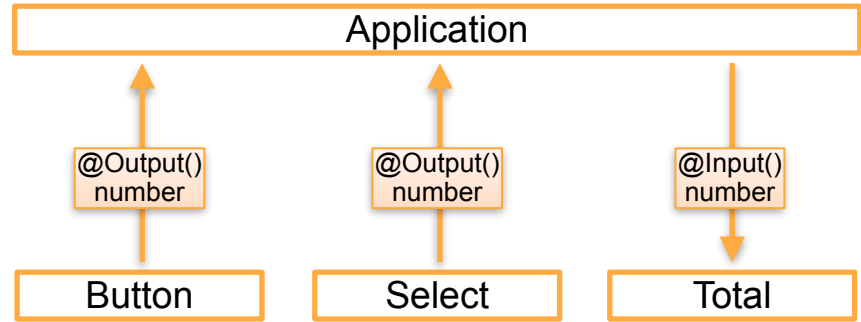
Component & Template Syntax - Lets do it

1. create a second component
2. add component property containing a number
3. show component property value in template
4. component property with this list:
[0, 1, 2, 3, 4, 5]
5. allow the user to select a value from this list with a `<select>`
use `[value]` & `(change)`

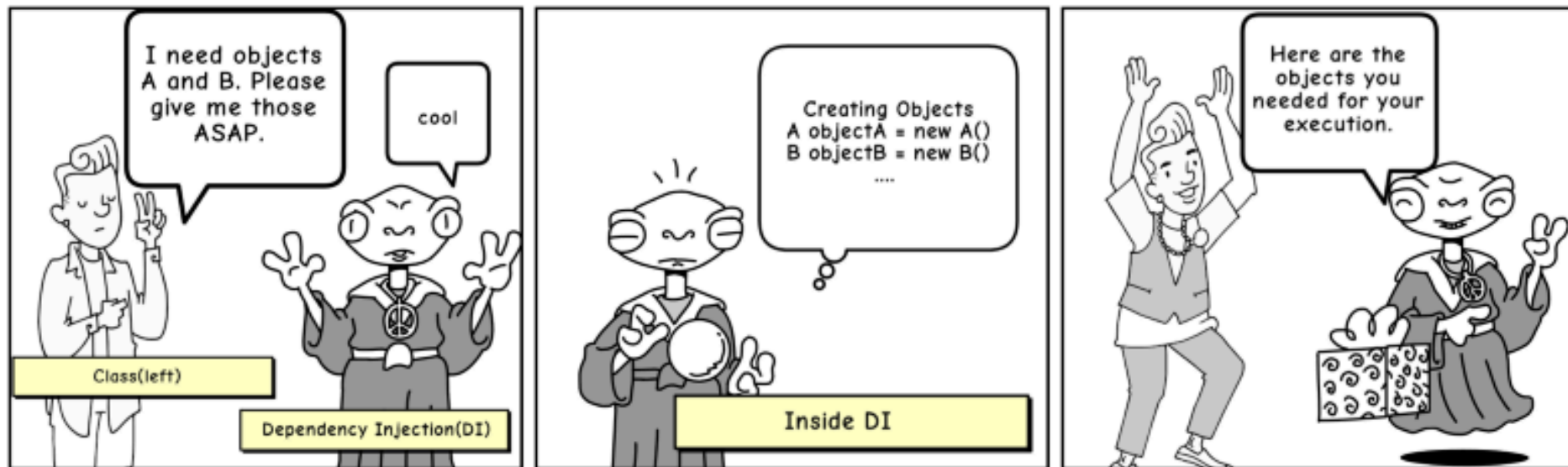


Component & Template Syntax - Lets do it

1. create a third component
2. this shows the total of the other two components
3. Add an input that gets the total from the parent
4. add outputs to the first 2 components that tell the parent of the current value when it has changed
5. only show this component when the total is larger than 0



Dependency Injection



This comic was created at www.MakeBeliefsComix.com. Go there and make one now!

Dependency Injection

Creates instances of classes

also handles dependencies of that class

Called “**Service**” in Angular

Share functionality

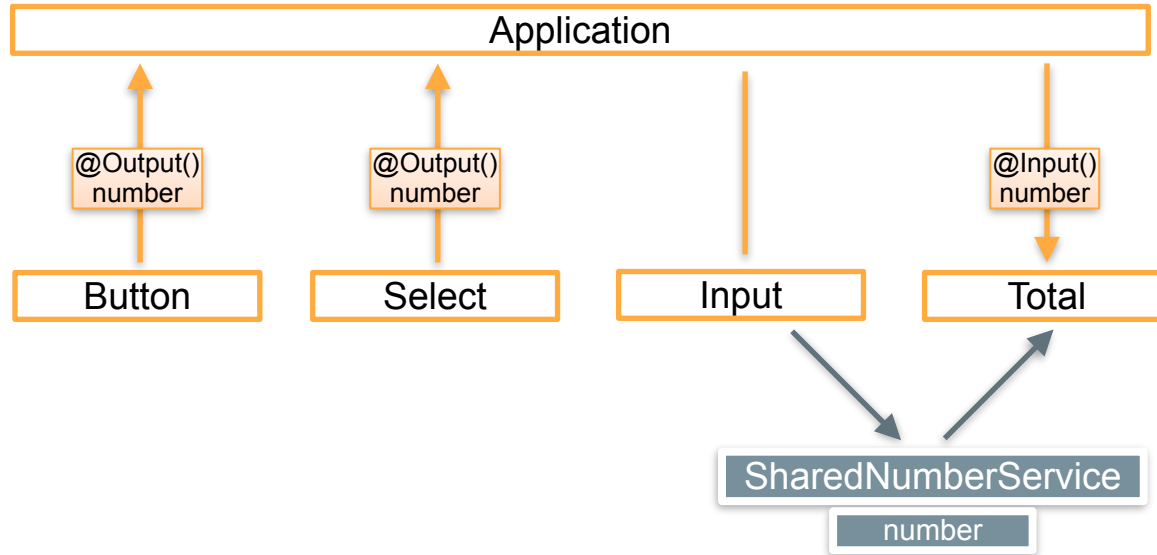
Share data

Singletons

but configurable

```
@Injectable({  
  providedIn: 'root'  
})  
export class SharedNumberService {  
  
  constructor() { }  
}
```

Dependency Injection



Dependency Injection - Lets do it

1. create a new component
2. add a number input
 - use (change) to get the value into the component class
3. generate a new service
4. give the component a property to hold the current number
5. inject the service into this new component
6. when number input changes, also update the current number in the service
7. also inject the service into the component with the totals
8. create a method in totals component that returns the total value (*this.total + this.yourService.number*)
9. replace the references in the template from *total* to this new method

And more

And More

Routing

Reactive Forms

RxJS

Lazy loading / bundle splitting

Server side rendering

Complex component composition

Signals (new!)



<https://rxjs.dev/>

Workshop Time

Workshop Todo List

Start a new project for Todo

Create a TodoListComponent

Create a TodoComponent

Create a Todo interface

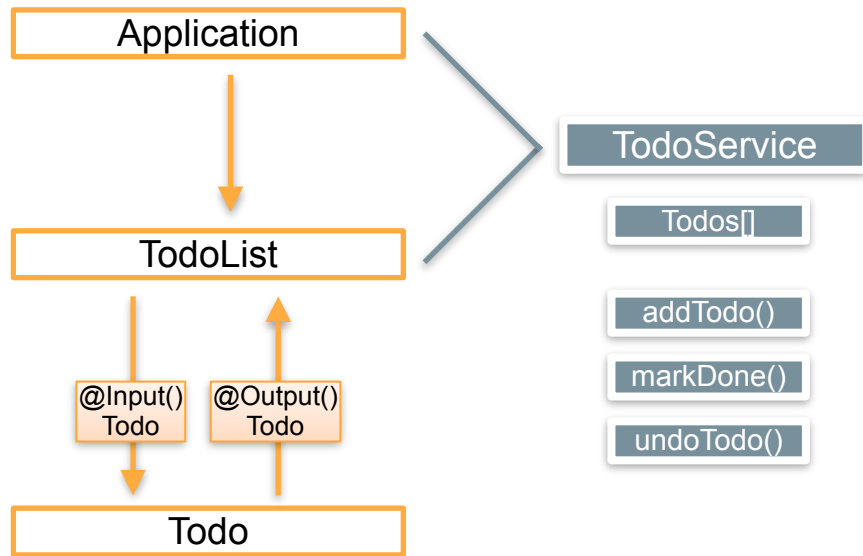
Create a TodoService

TodoService holds Todo[]

TodoService manipulates Todo[]

Add ability to add Todo

Add ability to mark Todo done



Workshop Todo List 2

Show Done Todos in a separate list

Add a due date to Todo

Show when due date is expired

Add feature to edit todo

