Angular Fundamentals

Module 5 – Building apps with multiple components

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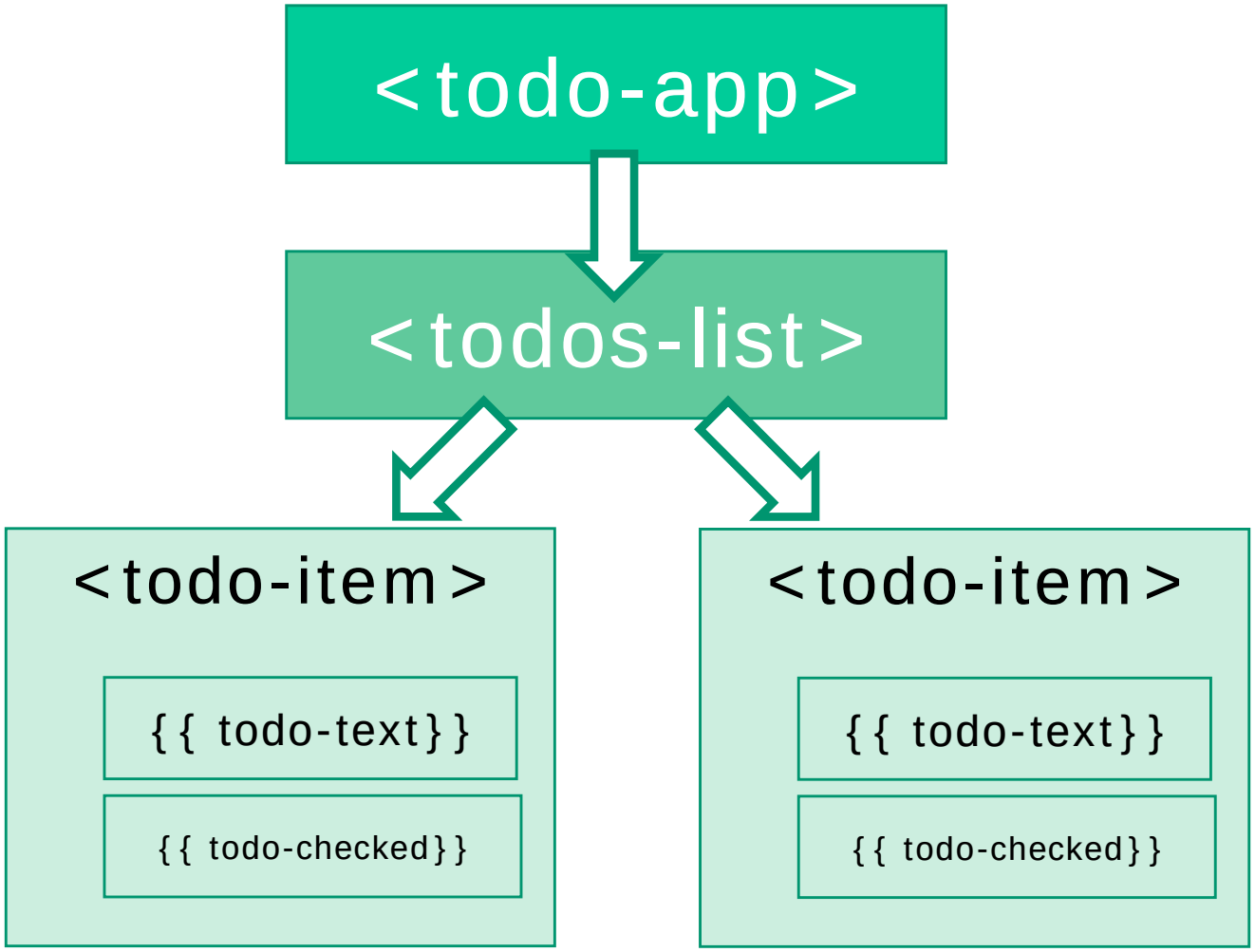
Angular-app: Tree of components



Recap - Applications as a “tree of components”

- Multiple components?
  1. Create files manually – or let CLI handle this for you
     1. `ng generate component <component-name>`
     2. `Ng g c <component-name>`
  2. Import in module – or (again) let CLI take care of this for you
  3. Add to `declarations : […]` section of `@ngModule`.
  4. Add the selector via HTML to `parent-component`

- Repeat for every component

1. Add DetailComponent

```
// city.detail.ts
import { Component } from ‘@angular/core';

@Component({
   selector: 'city-detail',
   template: `
   <h2>City details</h2>
      <ul class="list-group">
         <li class="list-group-item">Name: [city name]</li>
         <li class="list-group-item">Province: [province]</li>
         <li class="list-group-item">Highlights: [highlights]</li>
      </ul>
   `
})

export class CityDetail{

}
```

2. Add to Module – or let CLI handle this

```
// Angular Modules
…

// Custom Components
import {AppComponent} from './app.component';
import {CityDetail} from './city.detail';
import {CityService} from "./city.service";

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

New component

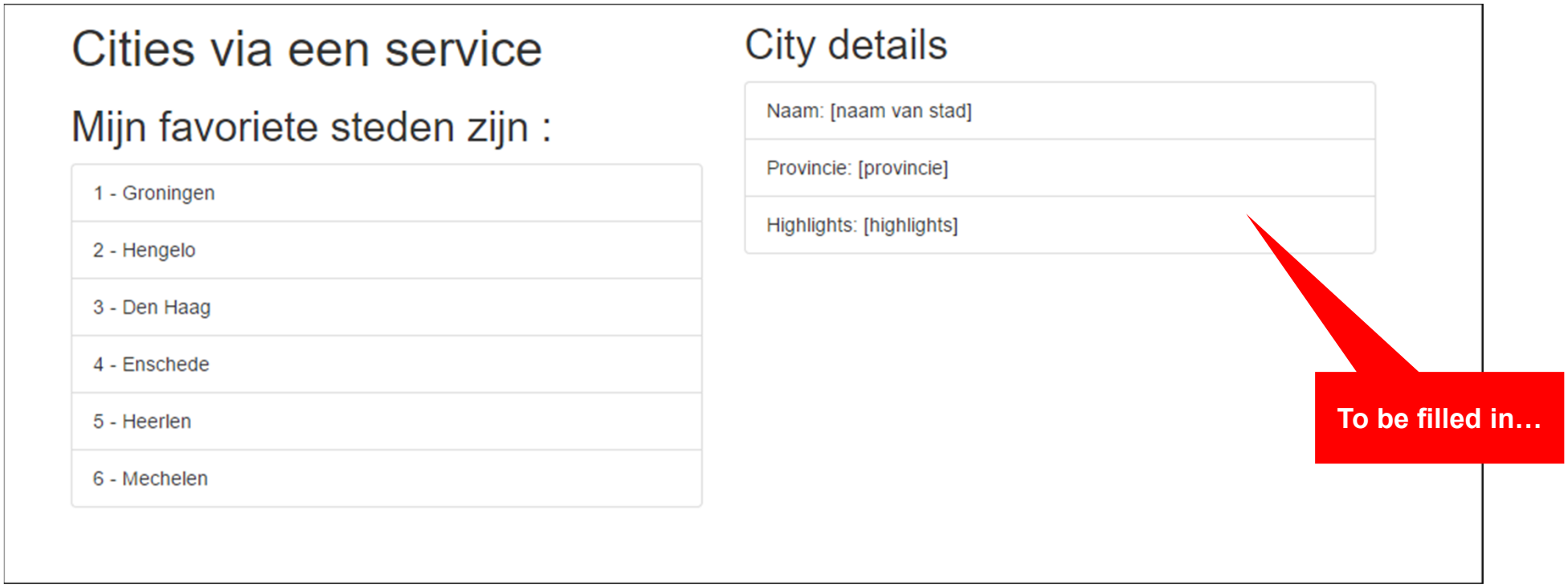
Add to declarations:[ ]

3. Encapsulate in HTML

```
<!-- app.html -->
<div class="row">
    …
   <div class="col-md-6">
      …
      <city-detail></city-detail>
   </div>
</div>
```

Combine with other HTML

4. Result



Goal: show details of selected city in child-component

Data flow between components

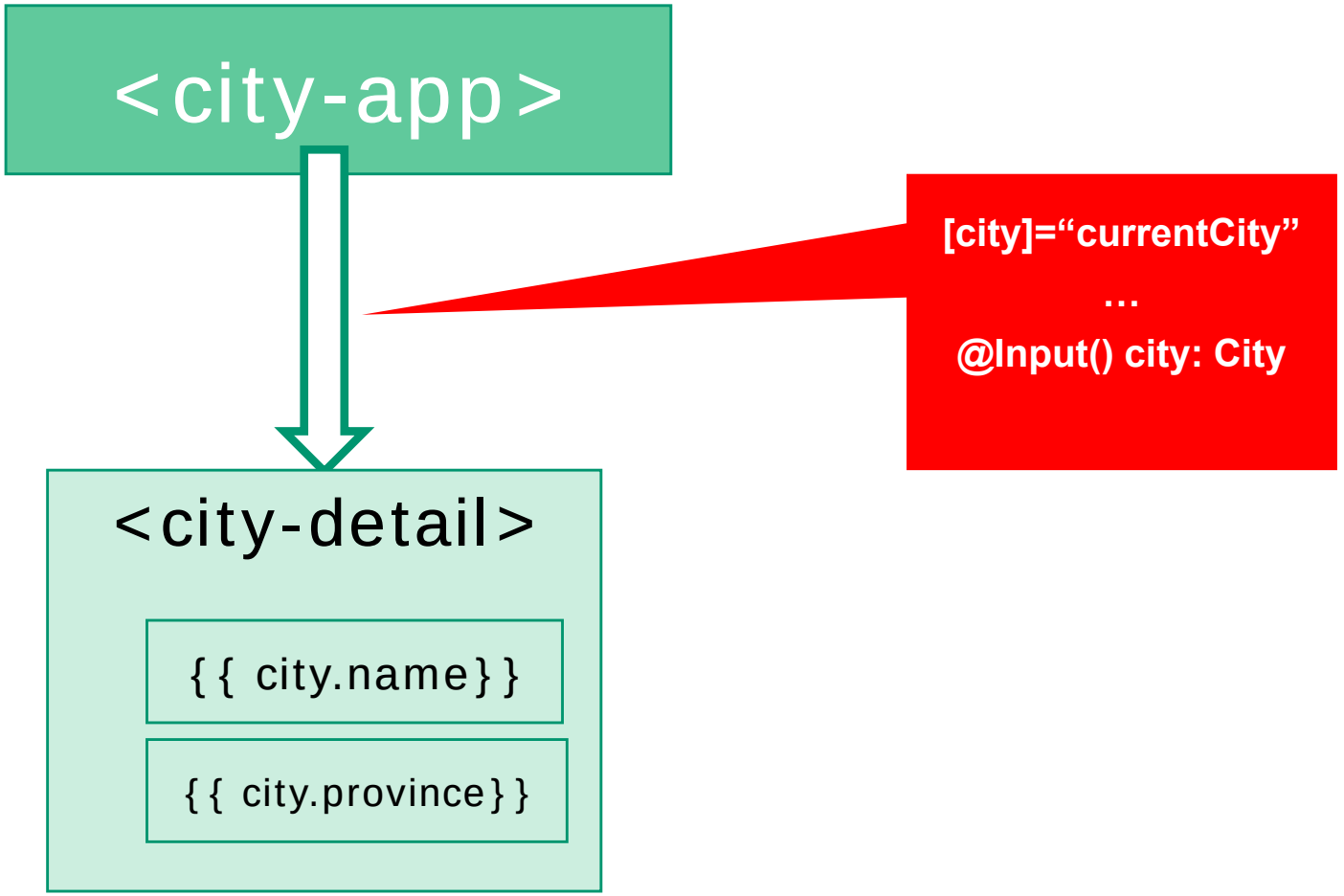
Using inputs and outputs

Data flow between components

"Data flows in to a component via `@Input()`'s"

Data flows out of a component via `@Output()`'s"

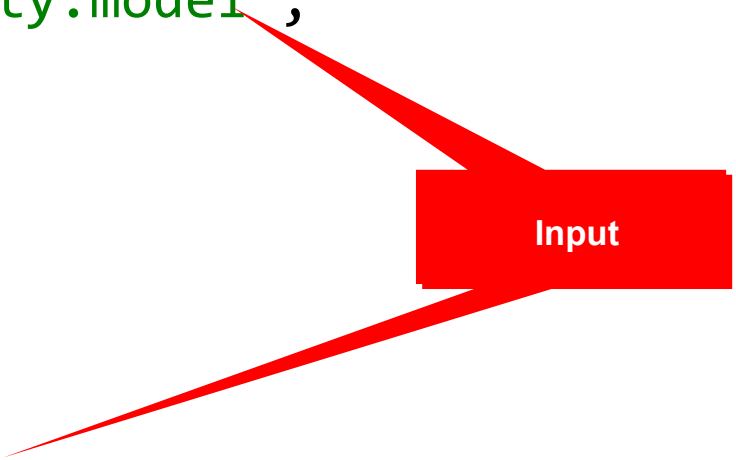
Parent-Child flow: decorator @Input()



Working with @Input()

1. Import Input decorator in component
2. Use annotation @Input() in class definition

```
// city.detail.ts
import { Component, Input } from '@angular/core';
import { City } from "./city.model";

@Component({
    …
})

export class CityDetail {
   @Input() city: City;
}
```

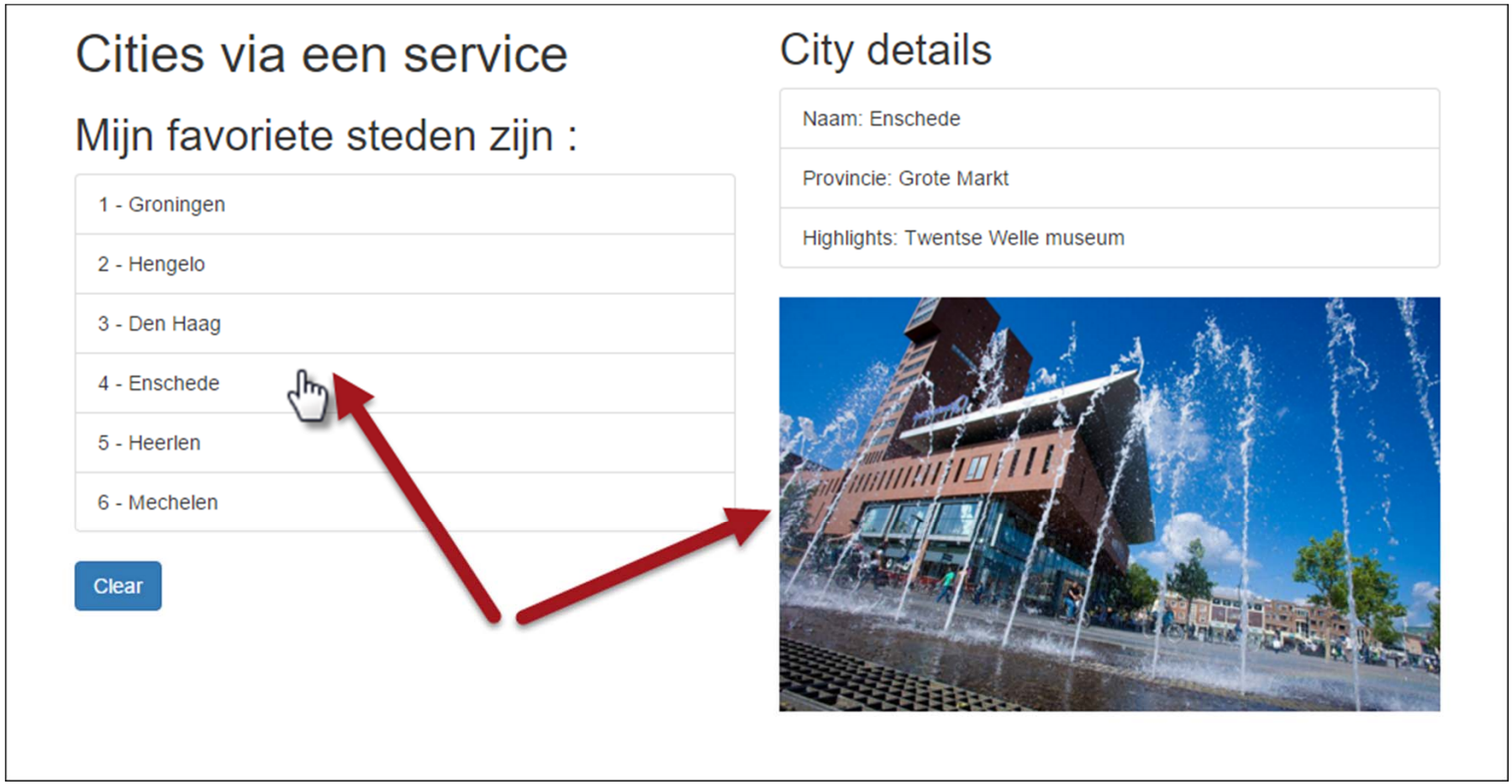


Update Parent Component for @Input

```
<!-- app.html -->
<div class="row">
   <div class="col-md-6">
      …
      <ul class="list-group">
         <li *ngFor="let city of cities" class="list-group-item"
                  (click)="getCity(city)">
            {{ city.id}} - {{ city.name }}
         </li>
      </ul>
      <button *ngIf="currentCity" class="btn btn-primary"
                  (click)="clearCity()">Clear</button>
   </div>
   <div class="col-md-6">
   <div *ngIf="currentCity">
         <city-detail [city]="currentCity"></city-detail>
      </div>
   </div>
</div>
```

Update!

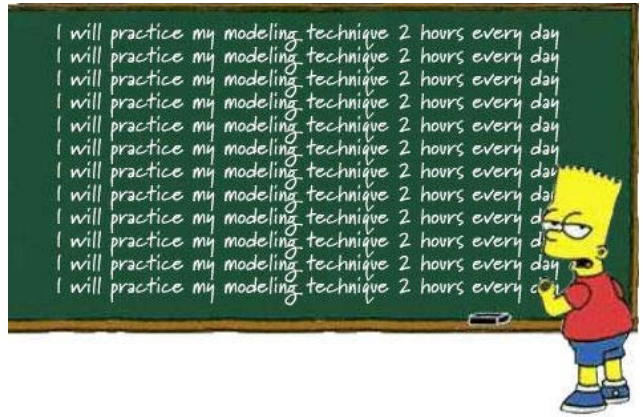
Result


Cities via een service
Mijn favoriete steden zijn :
1 - Groningen
2 - Hengelo
3 - Den Haag
4 - Enschede
5 - Heerlen
6 - Mechelen
Clear
City details
Naam: Enschede
Provincie: Grote Markt
Highlights: Twentse Welle museum

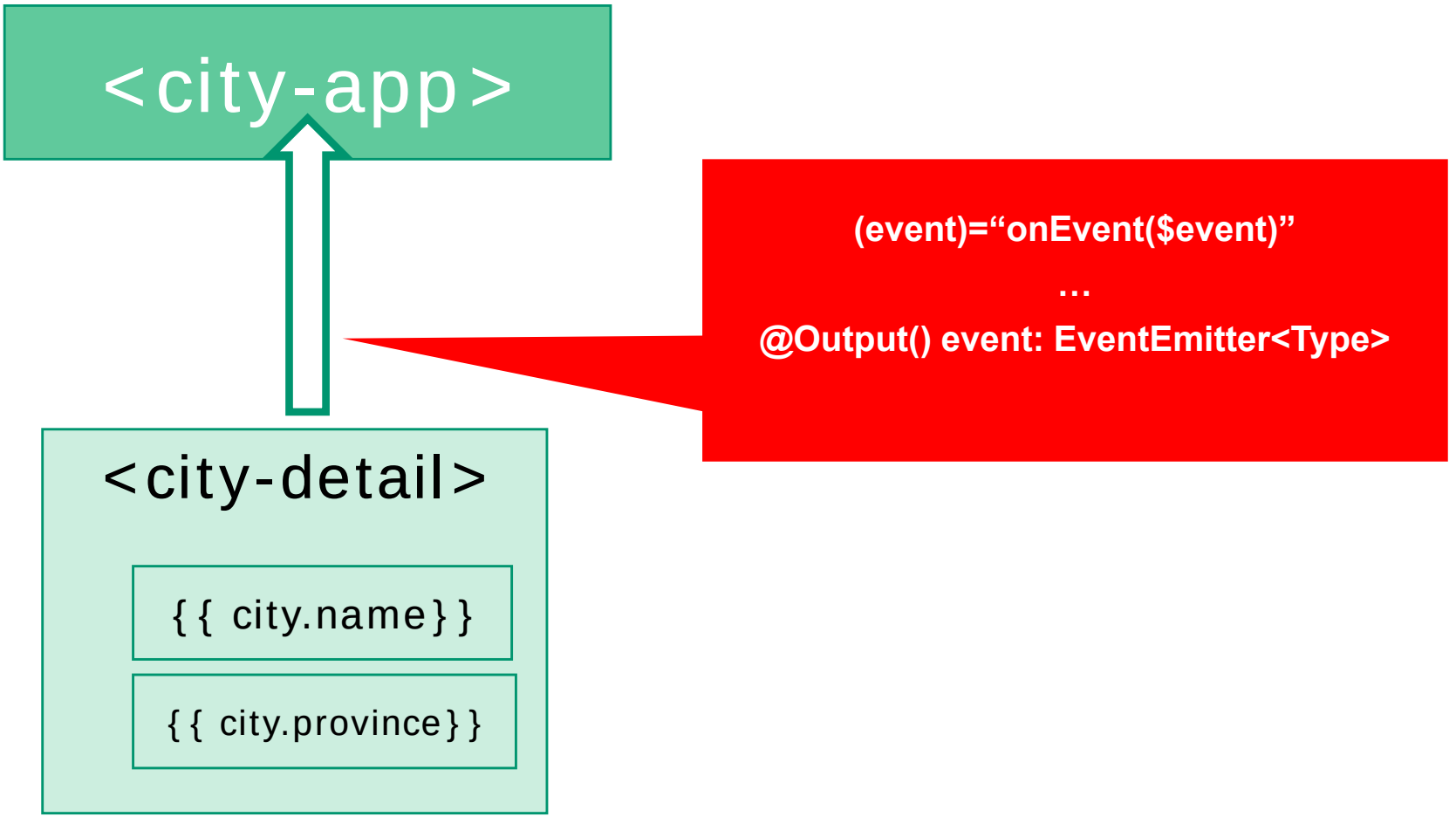
Checkpoint

- Components can be placed inside other components
- Enhance the HTML of the Parent Component with selector of the Child Component
- Remember to import the Child Component in `@ngModule`
- Data flow to Child Component : use `@Input()` and `[propName]="data"`
- Exercise: `6a)` and `6b)`
- Example: `/300-components`

Exercise….



Child-Parent flow: decorator @Output()



Method – equally, but the other way around

1. Import `Output` in component
2. Use decorator `@Output()` in class definition
3. New: define `EventEmitter` to emit events of certain type

“With @Output,

data flows up the Component Chain”

Rating our cities

```
// city.detail.ts
import { Component, Input, Output, EventEmitter} from '@angular/core';

@Component({
    …
    template: `
    <h2>City details
        <button (click)="rate(1)">+1</button>
        <button (click)="rate(-1)">-1</button>
    </h2>
    …
    `
})

export class CityDetail {
    @Input() city:City;
    @Output() rating: EventEmitter<number> = new EventEmitter<number>();

    rate(num) {
        console.log('rating for ', this.city.name, ': ', num);
        this.rating.emit(num);
    }
}
```

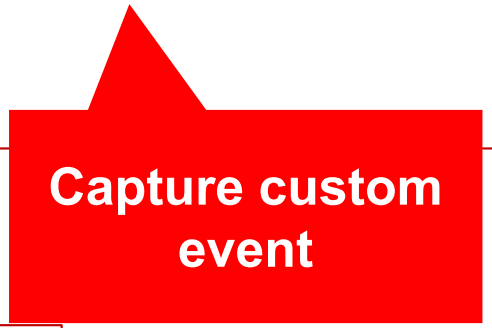
Imports

Bind custom events to DOM

Define & handle custom @Output event

Prepare parent component for custom event

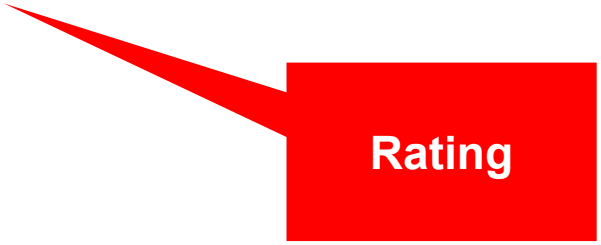
```
<!-- app.html -->
<div *ngIf="currentCity">
   <city-detail [city]="currentCity" (rating)="updateRating($event)">
   </city-detail>
</div>
```




```
// app.component.ts
// increase or decrease rating on Event Emitted
updateRating(rating){
   this.currentCity.rating += rating;
}
```

Show rating in HTML

```
<li *ngFor="let city of cities"
    class="list-group-item" (click)="getCity(city)">
   {{ city.id}} - {{ city.name }} ({{i}})
   <span class="badge">{{city.rating}}</span>
</li>
```



Result

Cities via een service

Mijn favoriete steden zijn :

1 - Groningen	0
2 - Hengelo	0
3 - Den Haag	-3
4 - Enschede	0
5 - Heerlen	2
6 - Mechelen	5

Clear

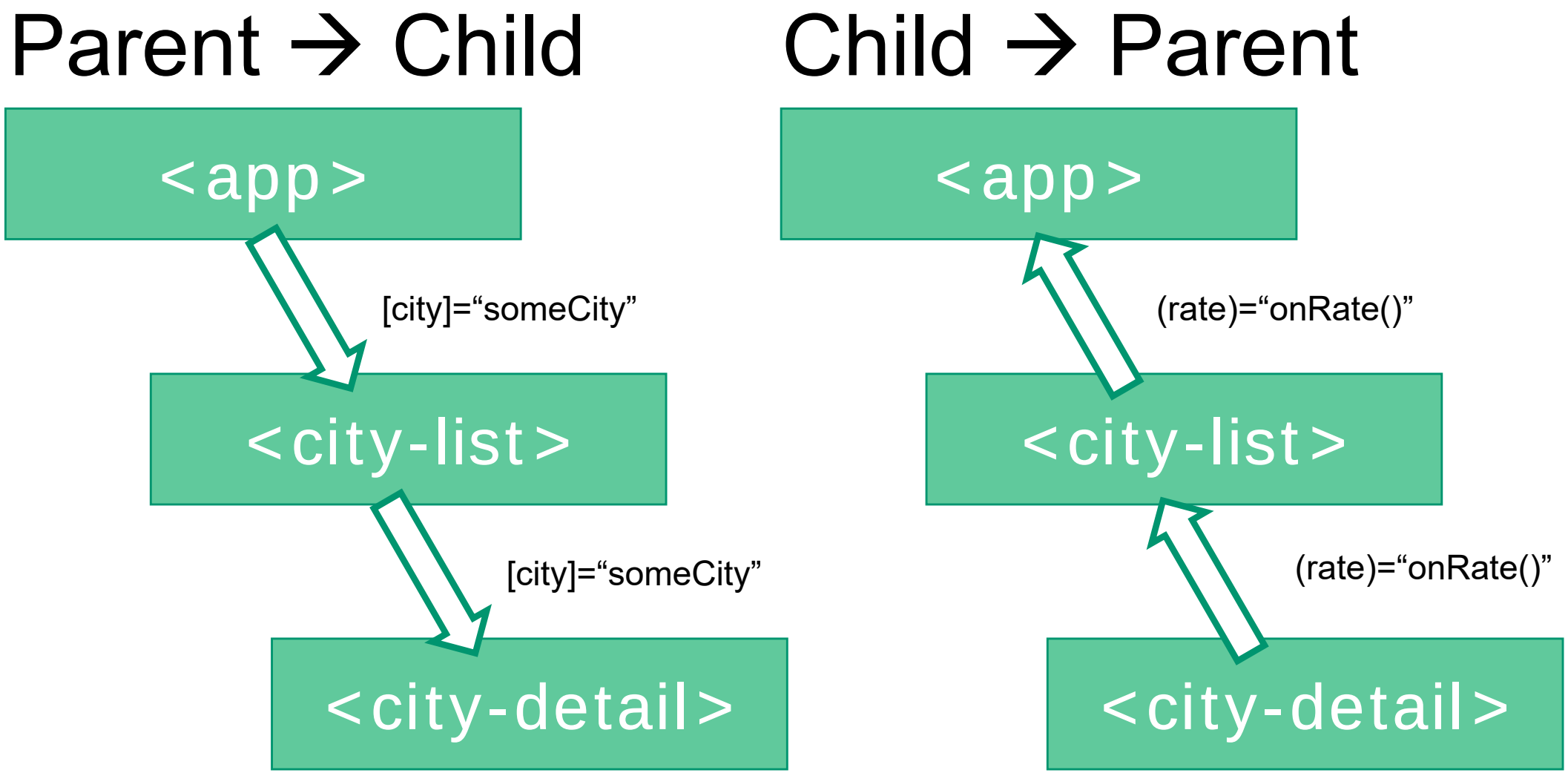
City details +1 -1

Naam: Den Haag

Provincie: Zuid-Holland

Highlights: Binnenhof

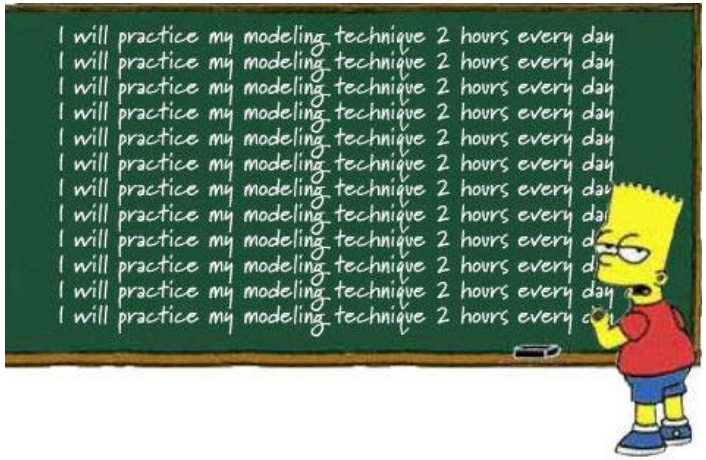
Summary


Parent → Child
<app>
[city]="someCity"
<city-list>
[city]="someCity"
<city-detail>
Child → Parent
<app>
(rate)="onRate()"
<city-list>
(rate)="onRate()"
<city-detail>

Checkpoint

- Data flow to Parent Component : using `@Output()` and `(eventName)="eventHandler($event)"`
- You can throw *any type* of data with the `EventEmitter`.
- Exercise: `6c)`
- Example: `/302-components-output`
- More info: https://vsavkin.com/the-core-concepts-of-angular-2-c3d6cbe04d04

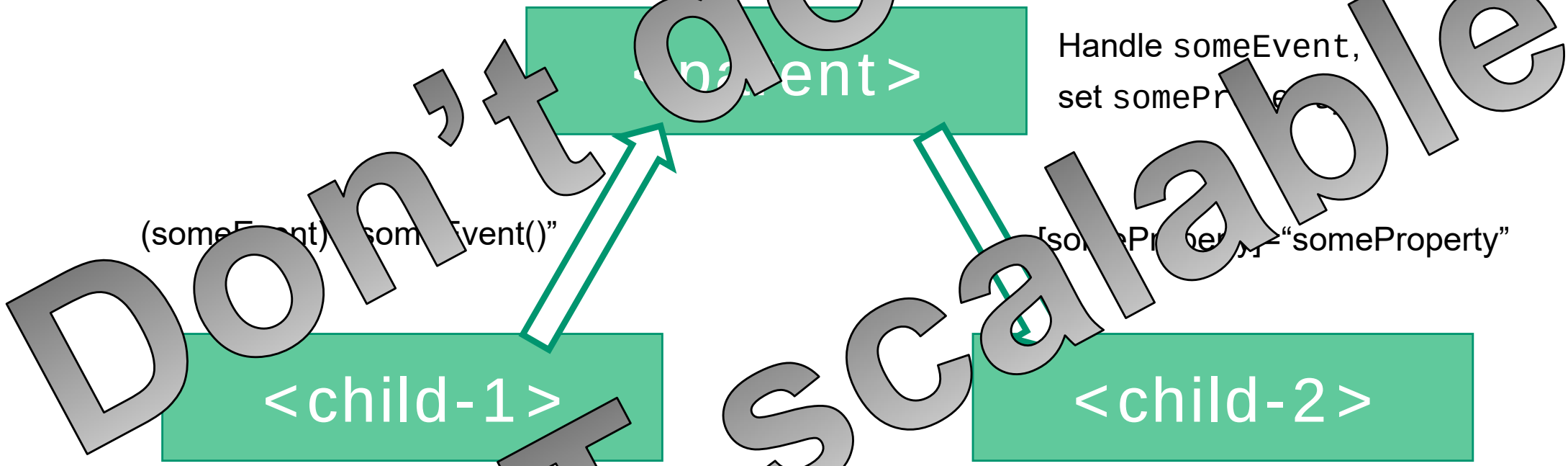
Exercise....



Sibling communication

Sibling communication

- Pass `Output()` of childcomponent, to `@Input()` of other childcomponent

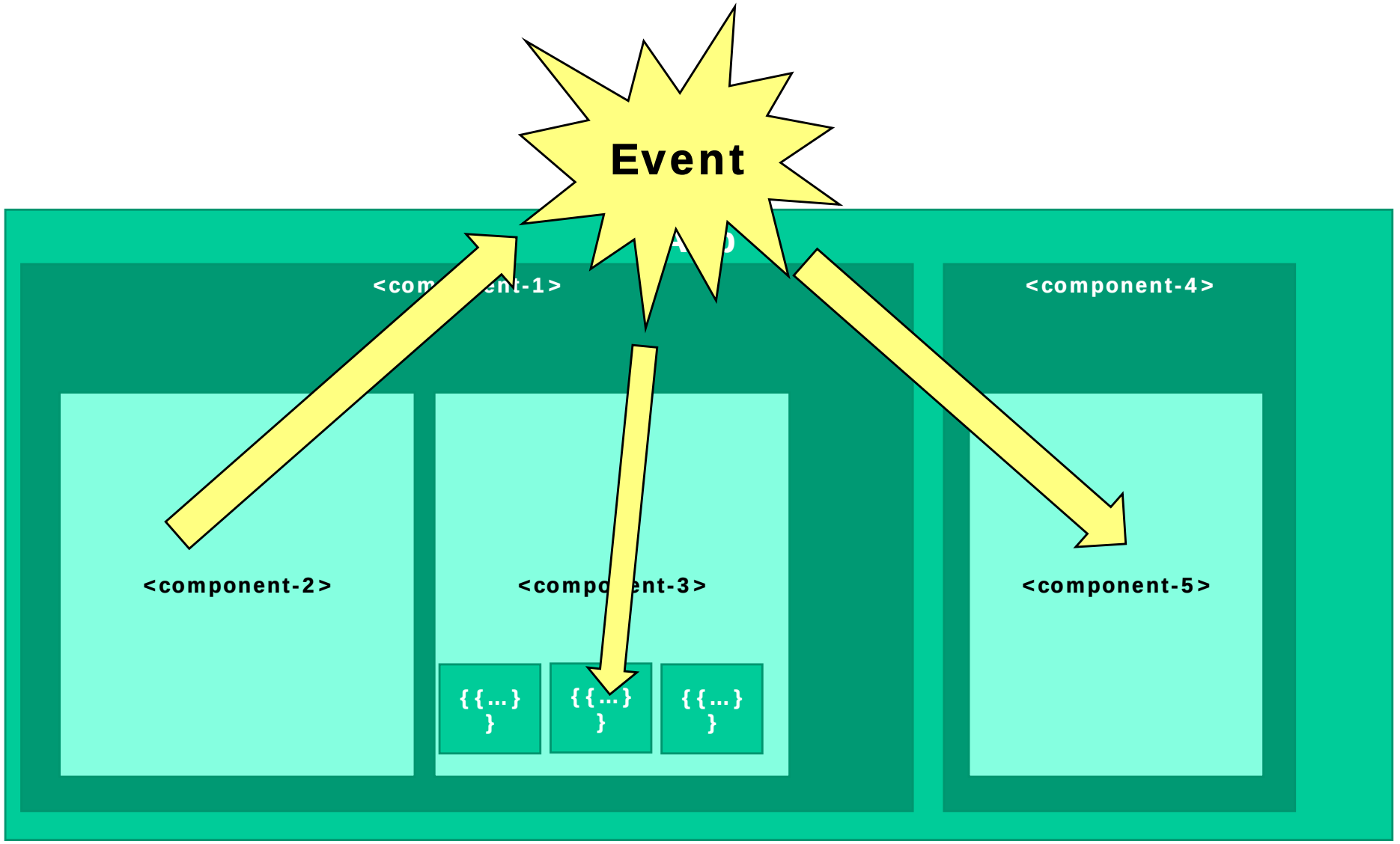


Don't do this!
NOT scalable

Better solution – using a Pub/Sub-system with Observables

- http://www.syntaxsuccess.com/viewarticle/pub-sub-in-angular-2.0

"Custom events, write an event bus"

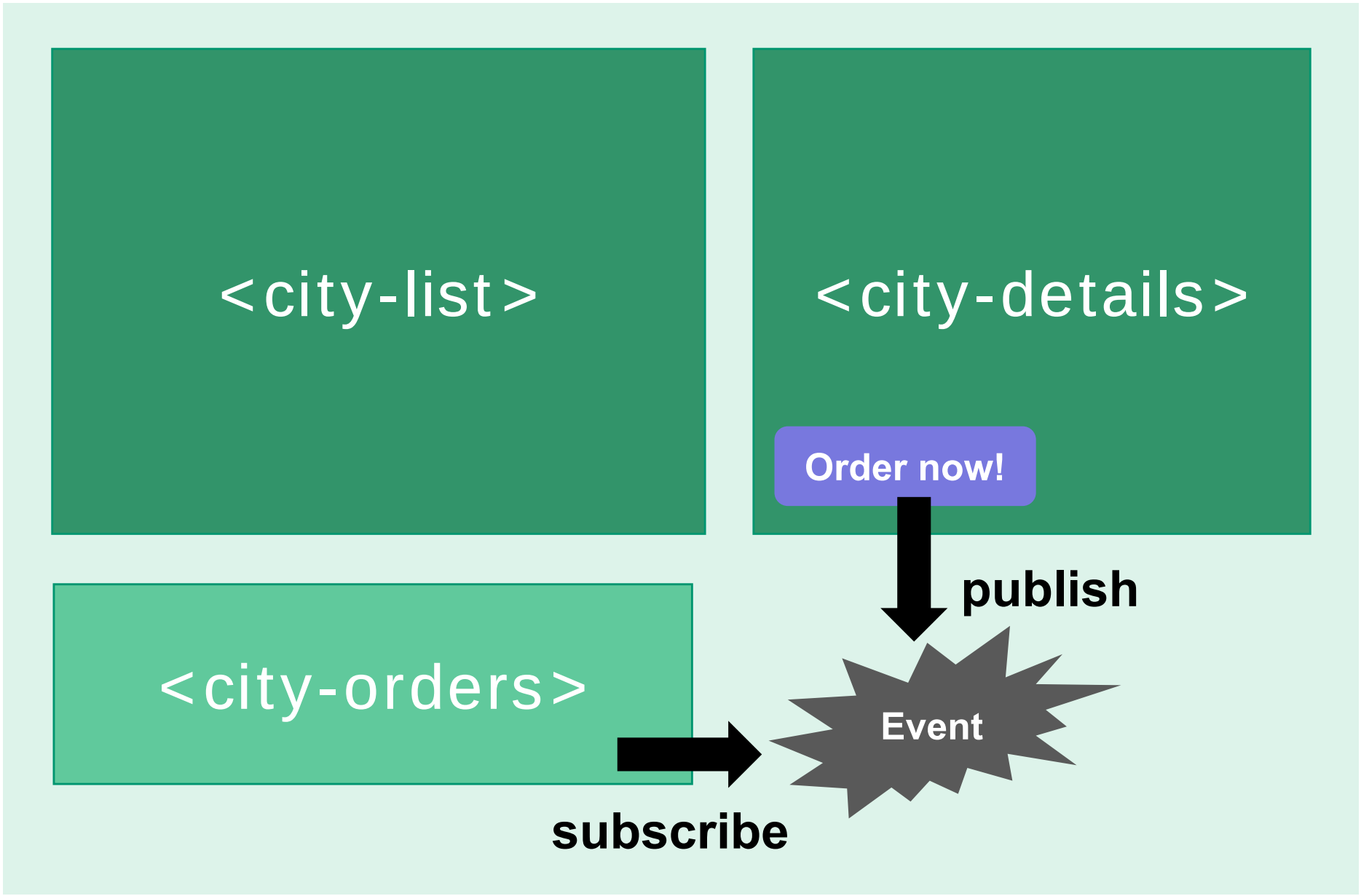

Event
<component-1>
<component-4>
<component-2>
<component-3>
<component-5>
{{...}}
{{...}}
{{...}}

Options

From RxJS library, work with

- `EventEmitter()`
- `Observable()`
- `Observer()`
- `Subject()` (implements `Observable` and `Observer`)

“Publish en Subscribe” – PubSub system


<city-list>
<city-details>
Order now!
publish
<city-orders>
Event
subscribe

Create PubSub-service

- Step 1 – create Publication Service
- Step 2 – Create ‘Producer’, or ‘Publish’ – component
- Step 3 – Create Subscriber-component

1. OrderService

```
// order.service.ts
import {Subject} from "rxjs/Subject";
import {Injectable} from "@angular/core";
import {City} from "../model/city.model";


@Injectable()
export class OrderService {
   Stream:Subject<City>;

   constructor() {
      this.Stream = new Subject<City>();
   }
}
```

2. Producer component ('Order now' button)

HTML:

```
<h2>Price of city trip:
{{ city.price | currency:'EUR':true:'1.2' }}
<button class="btn btn-lg btn-info"
   (click)="order(city)">Order Now!</button>
</h2>
```

Class:

```
// Place order. Emit event for this city.
// Catch the event in city.orders.ts
order(city) {
   console.log(`City trip booked for: ${this.city.name});
   this.orderService.Stream.next(city);
}
```

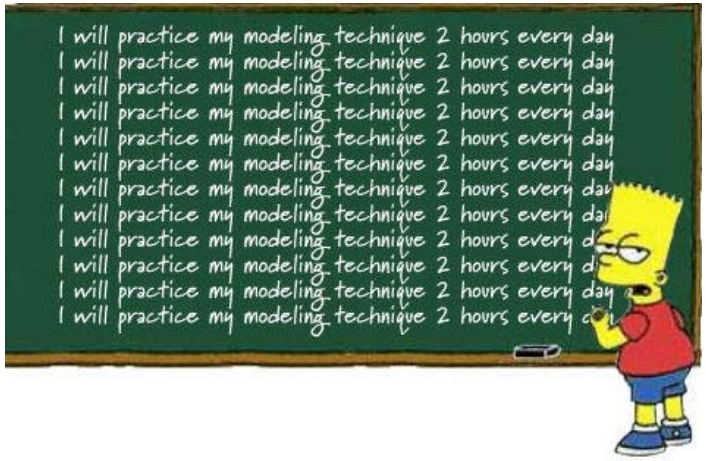
3. Subscriber component

```
// city.orders.ts - a kind of simple shopping cart,
// register which city trips are booked.
import …

@Component({
   selector: 'city-orders',
   template: `
   <div *ngIf="currentOrders.length > 0">
      …
})

export class CityOrders {
   …
   ngOnInit() {
      this.orderService.Stream
         .subscribe(
            (city:City) => this.processOrder(city),
            (err)=>console.log('Error handling City-order'),
            ()=>console.log('Complete...')
         )
   }
`    …
}
```

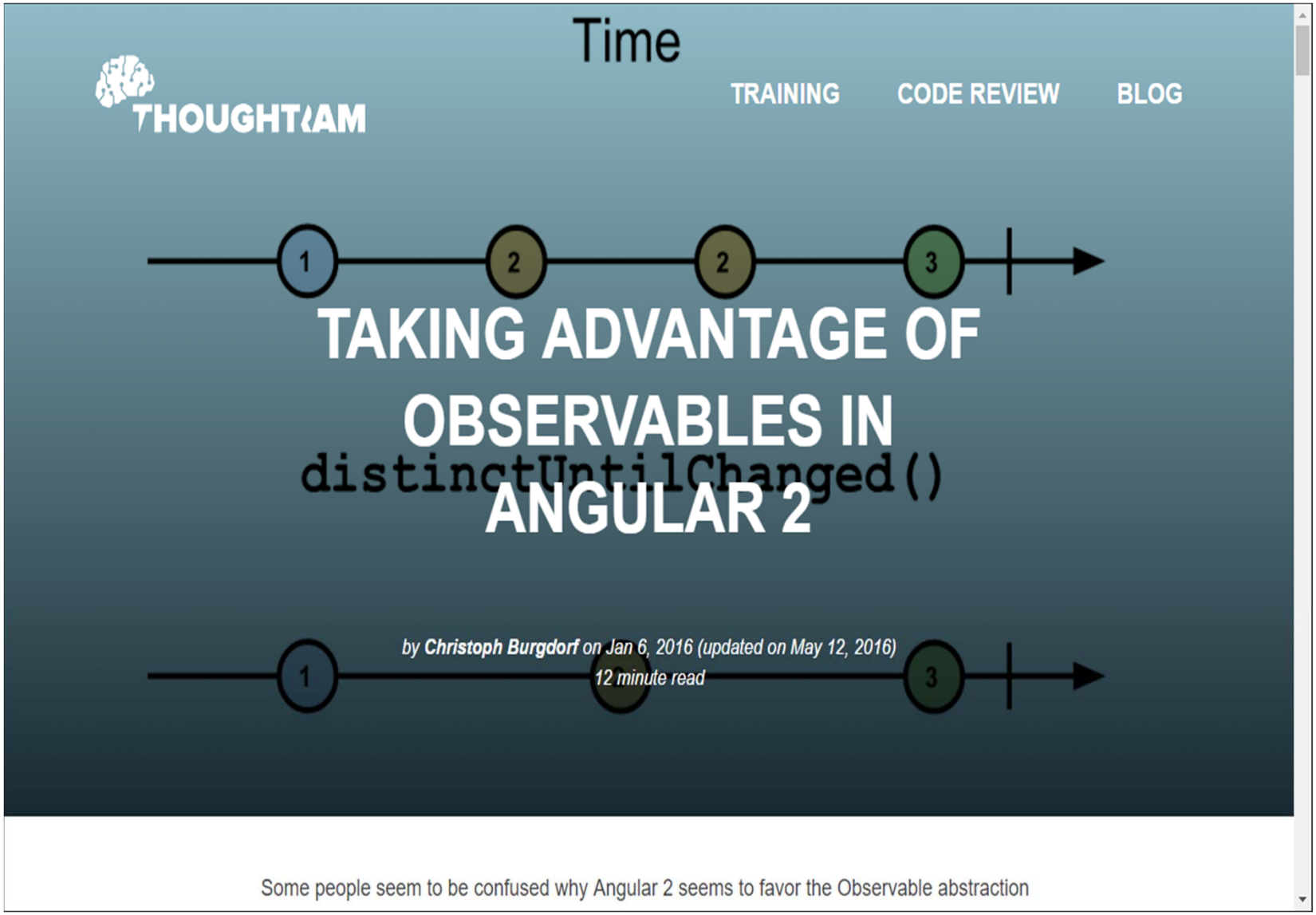
Checkpoint

- Event Bus : work with ‘invisible’ Streams and `Subject`
- There are options on working with Observable Streams.
- (Optional/Advanced: use a Redux-store (for example `@ngrx/store`))
- Example: `/303-pubsub-ordercomponent`
- Exercise : `6d) e-commerce application`

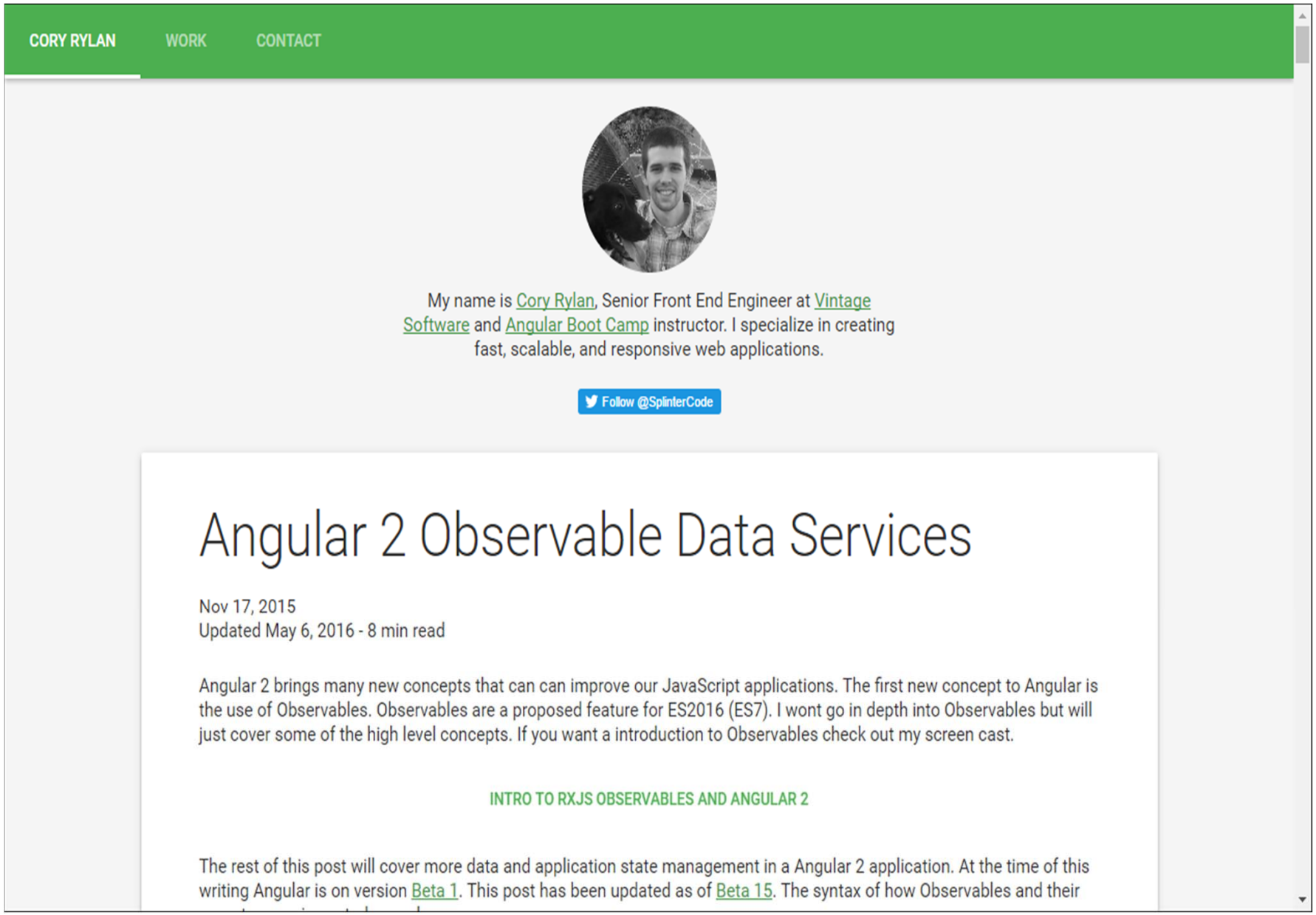
Exercise….



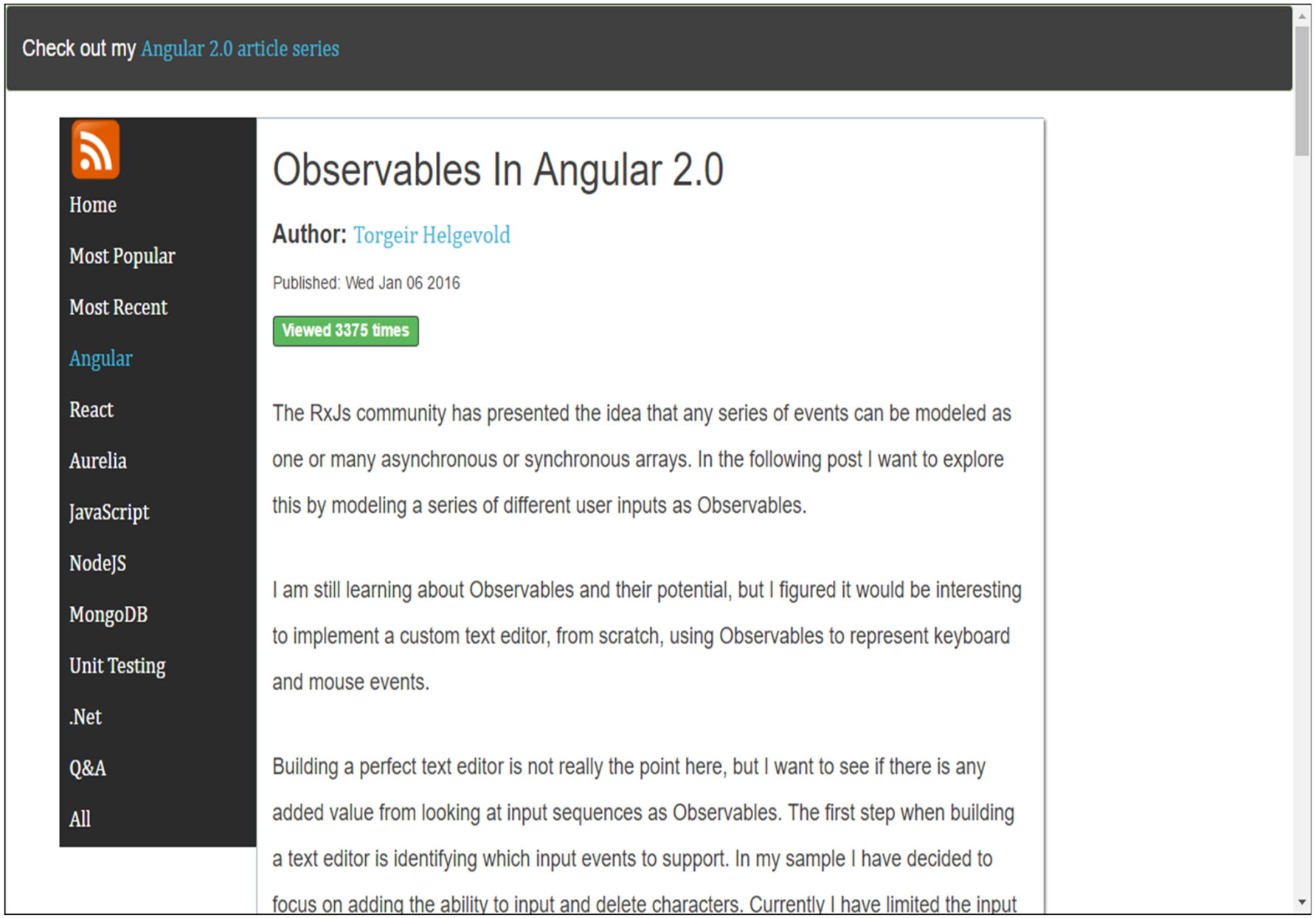
More on observables



http://blog.thoughtram.io/angular/2016/01/06/taking-advantage-of-observables-in-angular2.html



https://coryrylan.com/blog/angular-2-observable-data-services



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