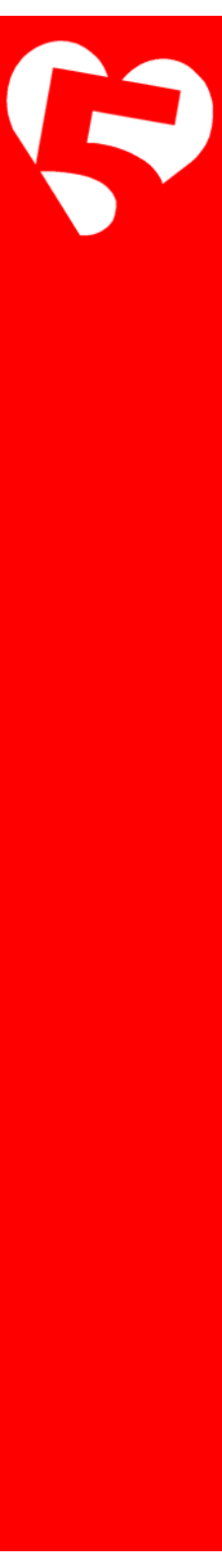


# Angular 2

## Module 2 - Databinding



Peter Kassenaar –  
[info@kassenaar.com](mailto:info@kassenaar.com)



Peter Kassenaar

# Angular 2.0

Web Development Library



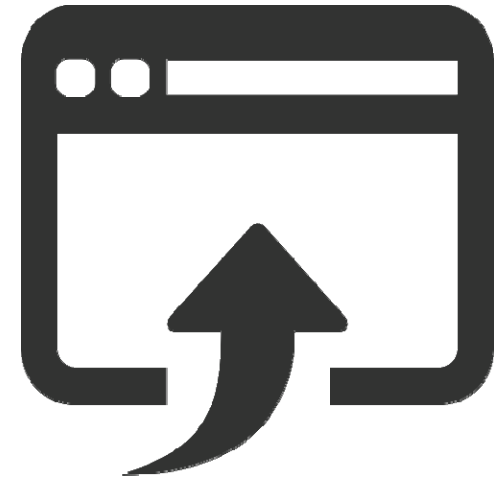
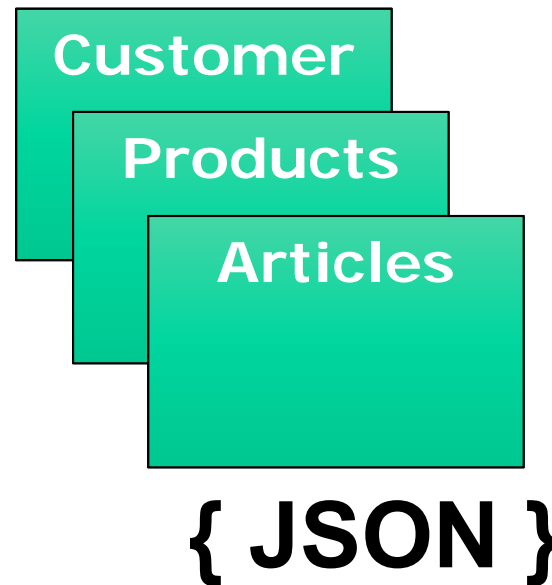
VAN DUUREN INFORMATICA

## Hoofdstuk 3



# Wat is databinding

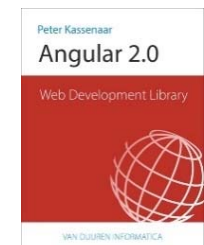
- Gegevens (data) tonen in de user interface
- Data afkomstig uit:
  - Controller / class
  - Database
  - User input
  - Andere systemen





# Declaratieve syntaxis

- Nieuwe notatiewijzen in HTML-views/partials.
  1. Simple data binding
  2. Event binding
  3. One-way data binding
  4. Two-way data binding
- Angular 1:
  - Views zijn op zichzelf staande HTML-documenten. Krijgen via router in een app onderlinge samenhang
- Angular 2:
  - Views horen bij een bepaalde component.



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# 1. Simple data binding syntax

Ongewijzigd ten opzichte van Angular 1. Dus nog steeds dubbele accolades:

```
<div>Stad: {{ city }}</div>
```

```
<div>Voornaam: {{ person.firstname }}</div>
```



# Altijd: samenwerking met component/class

```
import {Component} from 'angular2/core';

@Component({
  selector: 'hello-world',
  template: `<h1>Hello Angular 2</h1>
    <h2>Mijn naam is : {{ name }}</h2>
    <h2>Mijn favoriete stad is : {{ city }}</h2>
  `
})

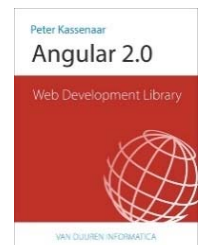
export class AppComponent {
  name = 'Peter Kassenaar';
  city = 'Groningen'
}
```



# Of: properties via constructor

```
export class AppComponent {  
  name: string;  
  city: string;  
  
  constructor() {  
    this.name = 'Peter Kassenaar';  
    this.city = 'Groningen'  
  }  
}
```

Vaak: persoonlijke voorkeur, of coding  
style/ organization preferences





# Binden via een lus: \*ngFor

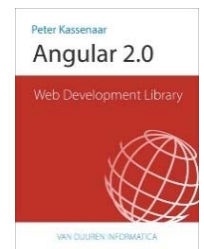
Template:

```
<h2>Mijn favoriete steden zijn :</h2>
<ul>
  <li *ngFor="#city of cities">{{ city }}</li> // pre-.rc1
  <li *ngFor="let city of cities">{{ city }}</li> // vanaf .rc1
</ul>
```

Class:

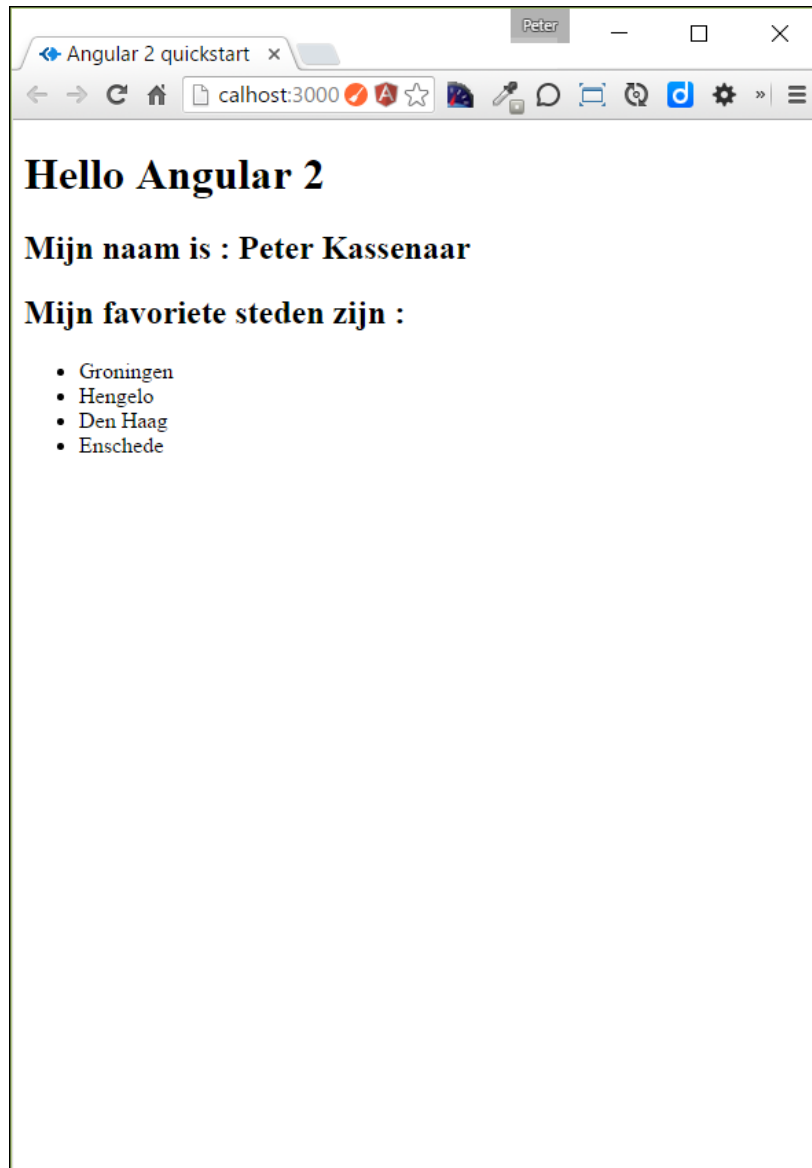
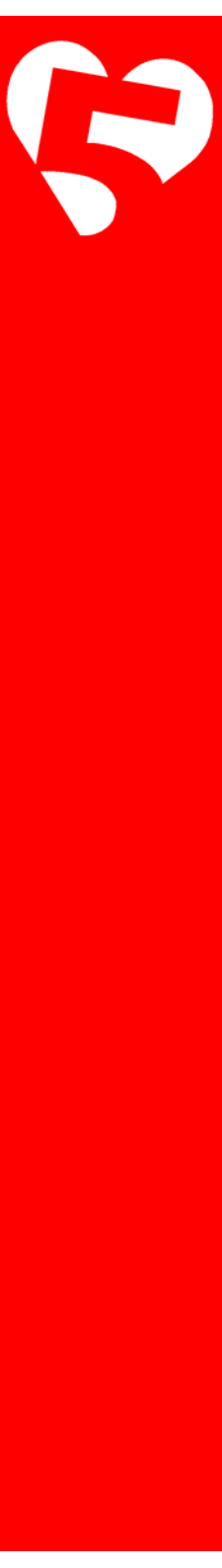
```
// Class met properties, array met cities
export class AppComponent {
  name:string;
  cities:string[];

  constructor() {
    this.name = 'Peter Kassenaar';
    this.cities = ['Groningen', 'Hengelo', 'Den Haag', 'Enschede']
  }
}
```



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Meer info:

<https://angular.io/docs/ts/latest/guide/displaying-data.html>



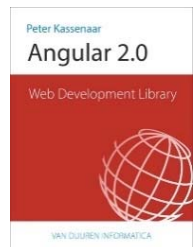
# Model maken (als in: MVC)

Class met properties die wordt geëxporteerd:

```
export class City{  
  constructor(  
    public id: number,  
    public name: string,  
    public province: string,  
  ){ }  
}
```

Let op de shorthand notatie bij `public id : number :`

1. Maakt lokale parameter
2. Maakt publieke parameter met zelfde naam
3. Initialiseert parameter bij instantiëring van de class met `new`



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# Model gebruiken

## 1. Model-class importeren

```
import {City} from './city.model'
```

## 2. Component aanpassen

```
export class AppComponent {  
  name = 'Peter Kassenaar';  
  cities = [  
    new City(1, 'Groningen', 'Groningen'),  
    new City(2, 'Hengelo', 'Overijssel'),  
    new City(3, 'Den Haag', 'Zuid-Holland'),  
    new City(4, 'Enschede', 'Overijssel'),  
  ]  
}
```

## 3. View aanpassen

```
<li *ngFor="let city of cities">{{ city.id }} - {{ city.name }}</li>
```



# Voorwaardelijk tonen met `*ngIf`

Gebruik de directive `*ngIf` (let op het sterretje!)

```
<h2 *ngIf="cities.length > 3">Jij hebt veel favoriete steden!</h2>
```





# Externe templates

Als je niet van inline HTML houdt:

```
@Component({  
  selector    : 'hello-world',  
  templateUrl: 'app/app.html'  
})
```



Bestand app.html

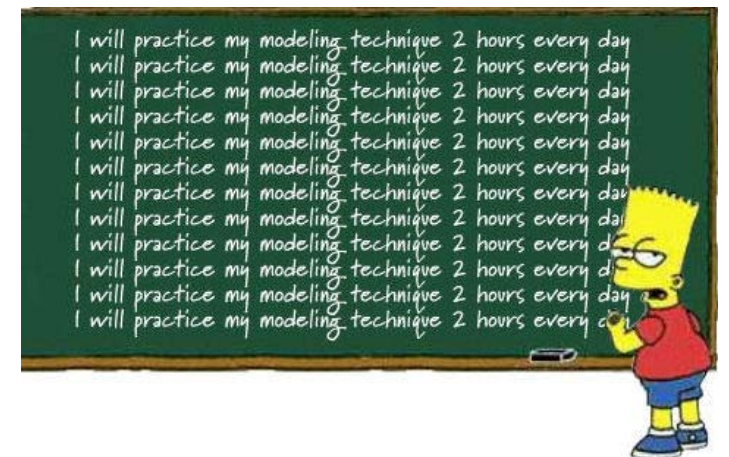
```
<!-- HTML in externe template -->  
<h1>Hello Angular 2</h1>  
<p>Dit is een externe template</p>  
<h2>Mijn naam is : {{ name }}</h2>  
<h2>Mijn favoriete steden zijn :</h2>  
...
```



# Checkpoint

- Simple data binding `{{ ... }}`
- Properties van de class worden gebonden
- Lussen en voorwaardelijke statement via `*ngFor` en `*ngIf`
- Eventueel externe HTML-templates

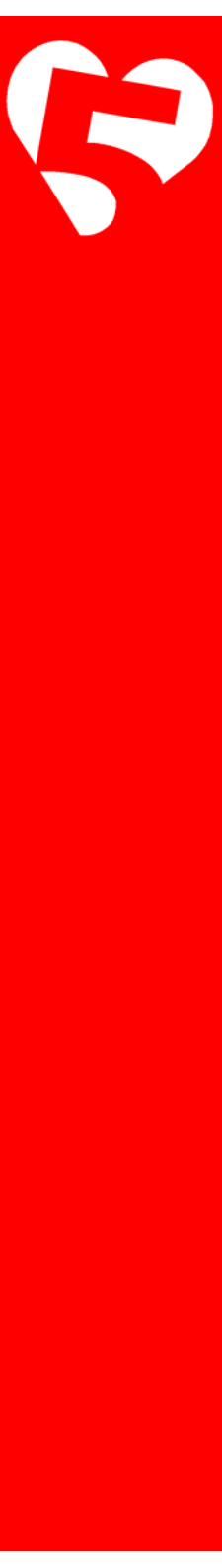
## Oefening....





# User input en event binding

Reageren op mouse, keyboard, hyperlinks en meer



# Hoofdstuk 4





# Event binding syntax

Gebruik ronde haken voor events:

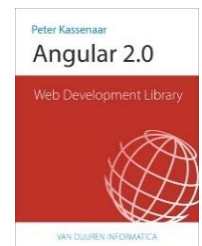
Angular 1:

```
<div ng-click="handleClick()">...</div>
```

Angular 2:

```
<div (click)="handleClick()">...</div>
```

```
<div (blur)="onBlur()">...</div>
```





# DOM-events

Angular2 kan naar *e/k* DOM-event luisteren, zonder dat er een aparte directive voor nodig is:

Event reference | MDN

← → ↻ 🏠 Mozilla Foundation [US] <https://developer.mozilla.org/en-US/docs/Web/Events>

- ▶ Ambient Light events
- ▶ App Cache events
- ▶ Audio Channels API events
- ▶ Battery API events
- ▶ Broadcast Channel API events
- ▶ Browser API events
- ▶ Channel Messaging API events
- ▶ Clipboard API events
- ▶ Contacts API events
- ▶ CSS Font Loading API events
- ▶ CSSOM events
- ▶ CSSOM View events
- ▶ Device Orientation events
- ▶ DOM events
- ▶ Device Sensors API events

This article offers a list of events that can be sent; some are standard events defined in official specifications, while others are events used internally by specific browsers; for example, Mozilla-specific events are listed so that [add-ons](#) can use them to interact with the browser.

## Standard events

These events are defined in official Web specifications, and should be common across browsers. Each event is listed along with the interface representing the object sent to recipients of the event (so you can find information about what data is provided with each event) as well as a link to the specification or specifications that define the event.

Event Name	Event Type	Specification	Fired when...
<a href="#">abort</a>	<a href="#">UIEvent</a>	<a href="#">DOM L3</a>	The loading of a resource has been aborted.
<a href="#">abort</a>	<a href="#">ProgressEvent</a>	<a href="#">Progress and XMLHttpRequest</a>	Progression has been terminated (not due to an error).
<a href="#">abort</a>	<a href="#">Event</a>	<a href="#">IndexedDB</a>	A transaction has been aborted.
<a href="#">afterprint</a>	<a href="#">Event</a>	<a href="#">HTML5</a>	The associated document has started printing or the print preview has been closed.
<a href="#">animationend</a>	<a href="#">AnimationEvent</a>	<a href="#">CSS Animations</a>	A CSS animation has completed.
<a href="#">animationiteration</a>	<a href="#">AnimationEvent</a>	<a href="#">CSS Animations</a>	A CSS animation is repeated.
<a href="#">animationstart</a>	<a href="#">AnimationEvent</a>	<a href="#">CSS Animations</a>	A CSS animation has started.
<a href="#">audioprocess</a>	<a href="#">AudioProcessingEvent</a>	<a href="#">Web Audio API</a> The definition of 'audioprocess' in that specification.	The input buffer of a <a href="#">ScriptProcessorNode</a> is ready to be processed.
<a href="#">audioend</a>	<a href="#">Event</a>	<a href="#">Web Speech API</a>	The user agent has finished capturing audio for speech recognition.
<a href="#">audiostart</a>	<a href="#">Event</a>	<a href="#">Web Speech API</a>	The user agent has started to capture audio for speech recognition.
<a href="#">beforeprint</a>	<a href="#">Event</a>	<a href="#">HTML5</a>	The associated document is about to be printed or previewed for printing.
<a href="#">beforeunload</a>	<a href="#">BeforeUnloadEvent</a>	<a href="#">HTML5</a>	

<https://developer.mozilla.org/en-US/docs/Web/Events>



# Voorbeeld event binding

## HTML

```
<!-- Event binding voor een button -->  
<button class="btn btn-success"  
    (click)="btnClick()">Ik ben een button</button>
```

## Class

```
export class AppComponent {  
    ...  
    counter: number = 0;  
  
    btnClick(){  
        alert('Je hebt ' + ++this.counter + ' keer geklikt');  
    }  
}
```



- Veel editors geven intellisense voor de beschikbare events
- In Angular taal:
  - Links van het isgelijktteken: **target of the binding**
  - Rechts van het isgelijktteken: **template expression**
  - Template expression wordt uitgevoerd in de **execution context** (= huidige class)



# Event binding met \$event

## HTML

```
<input type="text" class="input-lg" placeholder="Plaatsnaam..."  
      (keyup)="onKeyUp($event)"><br>  
<p>{{ txtKeyUp }}</p>
```

## Class

```
// 2. Binden aan keyUp-event in de textbox  
onKeyUp(event:any){  
    this.txtKeyUp = event.target.value + ' - ';  
}
```

*Probleem:* `event` is niet strongly typed. Als je dat echter wel doet, wordt de class veel minder portable

*Oplossing:* gebruik **local template variable** (zeg maar een soort “id” voor het element)



# Binding met local template variable

Declareer *local template variable* met # → Het hele element wordt doorgegeven aan de component

Let op: wél binden aan event, anders gebeurt er niks.

```
<input type="text" class="input-lg" placeholder="Plaatsnaam..."
      #txtCity (keyup)="betterKeyUp()">
<h3>{{ txtCity.value }}</h3>
```

Class:

```
// 3. Binden aan keyUp-event via local template variable
betterKeyUp(){
  //... do nothing, for now
}
```



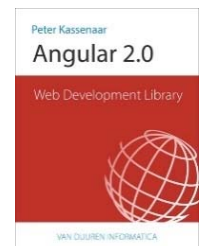
# Putting it all together...

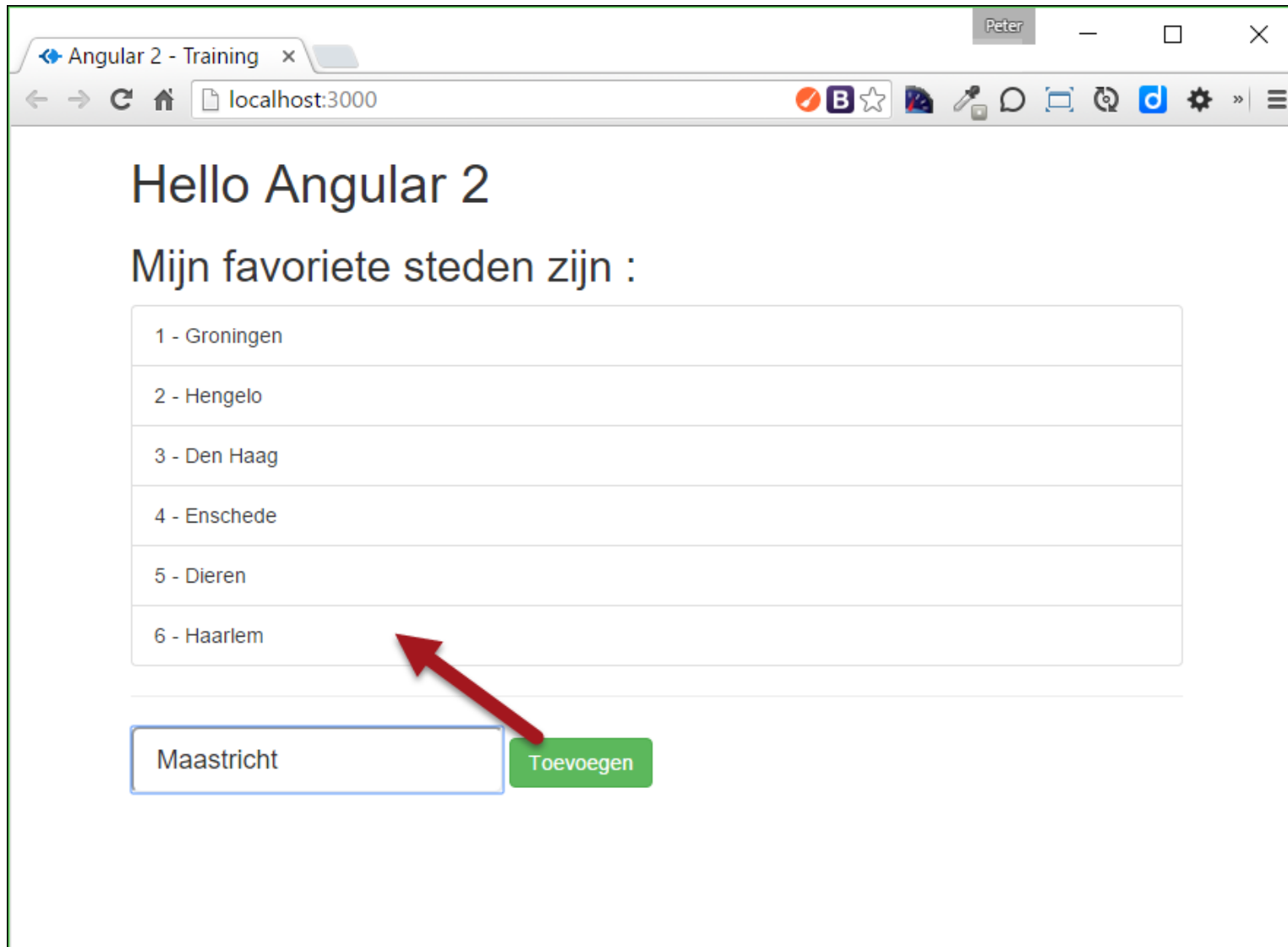
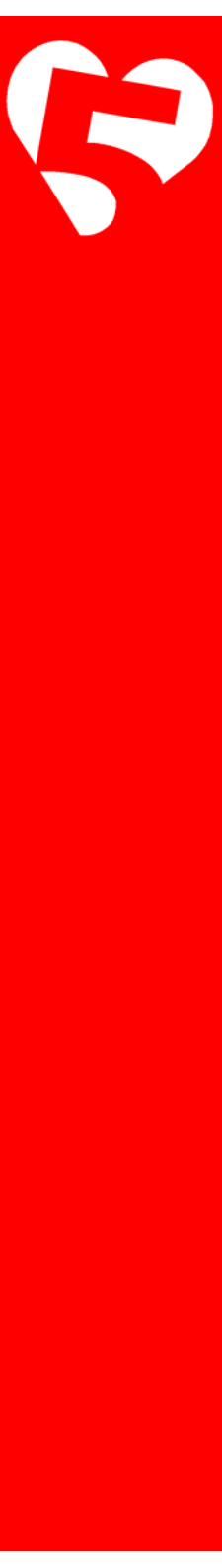
## HTML

```
<input type="text" class="input-lg" placeholder="Plaatsnaam..." #txtCity>
<button class="btn btn-success"
    (click)="addCity(txtCity)">Toevoegen
</button>
```

## Class

```
export class AppComponent {
    // Properties voor de component/class
    ...
    addCity(txtCity) {
        let newID    = this.cities.length + 1;
        let newCity = new City(newID, txtCity.value, 'Onbekend');
        this.cities.push(newCity);
        txtCity.value = '';
    }
}
```





Verder lezen/meer informatie: <https://angular.io/docs/ts/latest/guide/user-input.html>

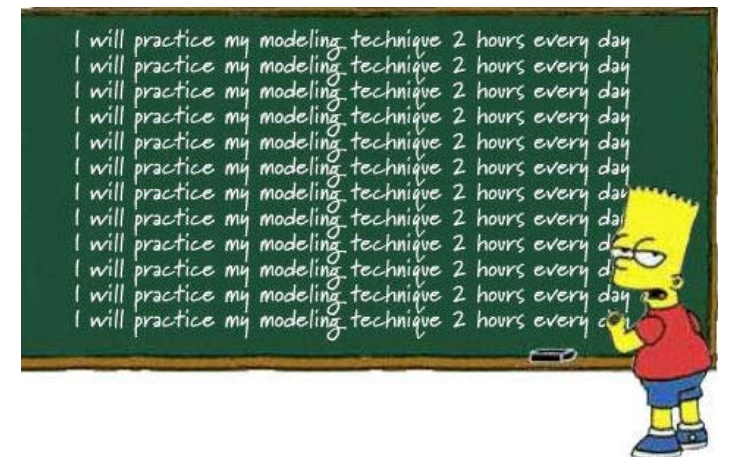




# Checkpoint

- Event binding wordt aangegeven met (eventName) = "..."
- Events worden afgehandeld door een event handler-functie in de component
- Gebruik # om een local template variable te declareren.
- Op deze manier zijn eenvoudige CRUD-operations te realiseren.

## Oefening....





# Attribute & property binding

Eigenschappen binden aan HTML-attributen en DOM-properties



# Attribute binding syntax

Rechtstreeks binden aan properties van HTML-elementen.

Ook wel: *one-way binding*.

Gebruik blokhaken syntaxis

Angular 1:

```
<div ng-hide="true|false">...</div>
```

Angular 2:

```
<div [hidden]="true">...</div>
```

Of :

```
<div [hidden]="person.hasEmail">...</div>
```

```
<div [style.backgroundColor]=" 'yellow' ">...</div>
```



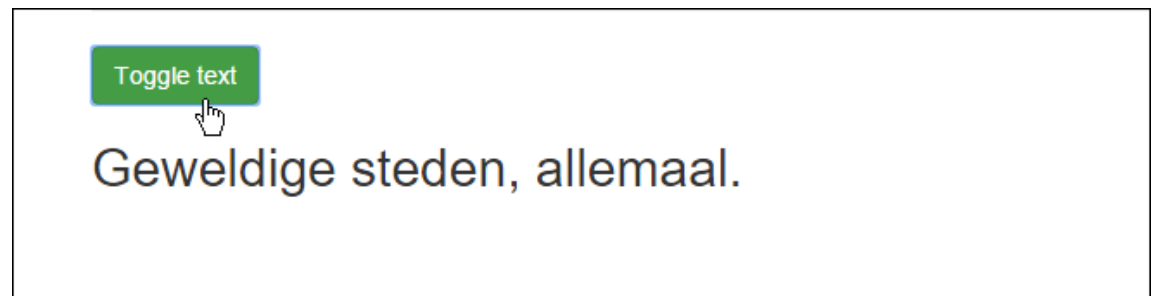
# Voorbeeld attribute binding

## HTML

```
<!-- Attribute binding -->  
<button class="btn btn-success" (click)="toggleText()">Toggle text</button>  
<h2 [hidden]="textVisible">Geweldige steden, allemaal.</h2>
```

## Class

```
// attribuut toggelen: tekst zichtbaar/onzichtbaar maken.  
toggleText(){  
  this.textVisible = !this.textVisible;  
}
```





# Bijvoorbeeld...

## HTML

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

## Class

```
export class AppComponent {
  // ...
  currentCity:City    = null;
  cityPhoto:string    = '';

  // Geselecteerde city updaten in de ui. Nieuw : ES6 String interpolation
  updateCity(city:City) {
    this.currentCity = city;
    this.cityPhoto   = `img/${this.currentCity.name}.jpg`;
  }
}
```



Demo:

..\04-attributebinding\app\app-02.html en

..\app-02.component.ts

## Hello Angular 2

Mijn favoriete steden zijn :

1 - Groningen

2 - Hengelo

3 - Den Haag

4 - Enschede



mijn stad: Groningen

Meer informatie: <https://angular.io/docs/ts/latest/guide/template-syntax.html#!#property-binding>



# Meer binding-opties

- Attribute binding en DOM-property binding
- Class binding : [ngClass]
- Style binding : [ngStyle]
- <https://angular.io/docs/ts/latest/guide/template-syntax.html>

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3. Displaying Data

4. User Input

5. Forms

6. Dependency Injection

7. Template Syntax

8. Pipes

9. Routing & Navigation

10. Lifecycle Hooks

With this model firmly in mind, we are ready to discuss the variety of target properties to which we may bind.

### Binding Targets

The **target of a data binding** is something in the DOM. Depending on the binding type, the target can be an (element | component | directive) property, an (element | component | directive) event, or (rarely) an attribute name. The following table summarizes:

Binding Type	Target	Examples
Property	Element Property Component Property Directive property	<pre>&lt;img [src] = "heroImageUrl"&gt; &lt;hero-detail [hero]="currentHero"&gt;&lt;/hero-detail&gt; &lt;div [ngClass] = "{selected: isSelected}"&gt;&lt;/div&gt;</pre>
Event	Element Event Component Event Directive Event	<pre>&lt;button (click) = "onSave()"&gt;Save&lt;/button&gt; &lt;hero-detail (deleted)="onHeroDeleted()"&gt;&lt;/hero-detail&gt; &lt;div myClick (myClick)="clicked=\$event"&gt;click me&lt;/div&gt;</pre>
Two-way	Directive Event Property	<pre>&lt;input [(ngModel)]="heroName"&gt;</pre>



# Two-way binding

User interface en logica gelijktijdig updaten





# Two way binding syntax

Is een tijdje weg geweest uit Angular 2, maar op veler verzoek toch teruggekeerd

Angular 1:

```
<input ng-model="person.firstName" />
```

Angular 2: de notatie is een beetje bizar:

```
<input [(ngModel)]="person.firstName" />
```



# [(ngModel)] gebruiken

## HTML

```
<input type="text" class="input-lg" [(ngModel)]="newCity" />  
<h2>{{ newCity }}</h2>
```

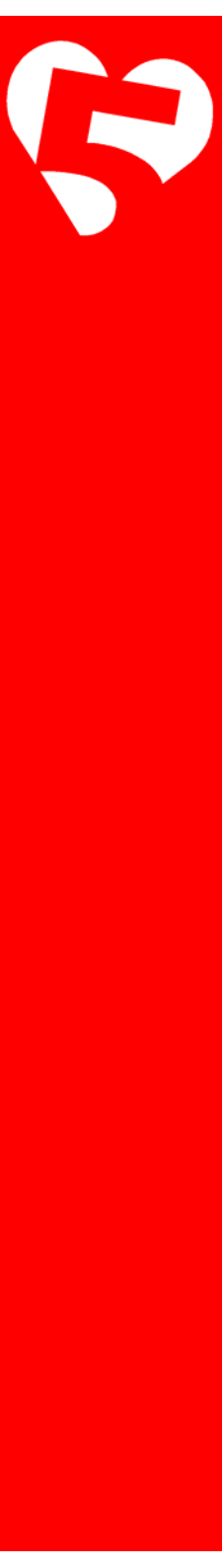
Dat is shorthand-notatie voor:

```
<!-- Two-way binding met uitgebreide syntaxis-->  
<input type="text" class="input-lg"  
      [value]="newCityExtended"  
      (input)="newCityExtended = $event.target.value" />  
<h2>{{ newCityExtended }}</h2>
```



# FormsModule importeren

- Vroeger maakte de Formulier-functionaliiteit standaard deel uit van Angular.
- Nu niet meer – apart importeren in `app.module.ts`!
- `import {FormsModule} from "@angular/forms";`
- ...
- `imports : [BrowserModule, FormsModule],`



# Binding cheat sheet

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8. Pipes

9. Routing & Navigation

10. Lifecycle Hooks

11. Attribute Directives

12. Structural Directives

13. Hierarchical Injectors

ANGULAR CHEAT SHEET

Angular 2 for TypeScript

This cheat sheet is provisional and may change. Angular 2 is currently in Beta.

Angular for TypeScript Cheat Sheet (v2.0.0-beta.0)

Bootstrapping

`import {bootstrap} from 'angular2/angular2';`

`bootstrap(MyAppComponent, [MyService, provide(...)]);`

Bootstraps an application with MyAppComponent as the root component and configures the DI providers.

Template syntax

`<input [value]="firstName">`

Binds property `value` to the result of expression `firstName`.

`<div [attr.role]="myAriaRole">`

Binds attribute `role` to the result of expression `myAriaRole`.

`<div [class.extra-sparkle]="isDelightful">`

Binds the presence of the CSS class `extra-sparkle` on

<https://angular.io/docs/ts/latest/guide/cheatsheet.html>



# Ingebouwde directives

Veel directives konden vervallen door de nieuwe syntaxis. Er zijn er nog maar weinig over.

Directives die het DOM manipuleren: herkenbaar aan sterretje/asterisk

```
<div *ngFor="let person of Persons">...</div>
```

```
<div *ngIf="showDiv">...</div>
```

```
<div [ngClass]="setClasses()">...</div>
```

```
<div [ngStyle]="setStyles()">...</div>
```



# Samenvatting...

- Databinding is in Angular 2 vernieuwd
- Leer werken met de nieuwe notatie voor DOM- en Attribute binding, event binding en two-way binding
- Pas altijd de Component en de bijbehorende View aan.
- Veel concepten komen overeen, de uitwerking is totaal nieuw, in vergelijking met Angular 1