IK WIL

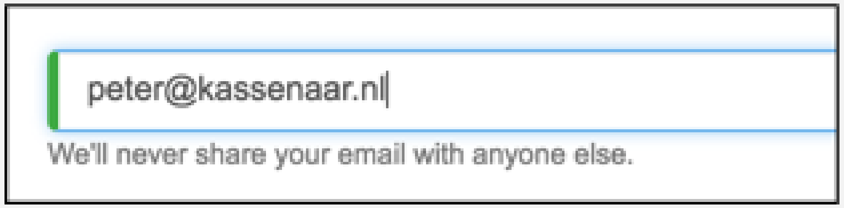
Angular – Module Forms

vijfhart IT-OPLEIDINGEN

Contents

Forms in Web Applications - Tasks

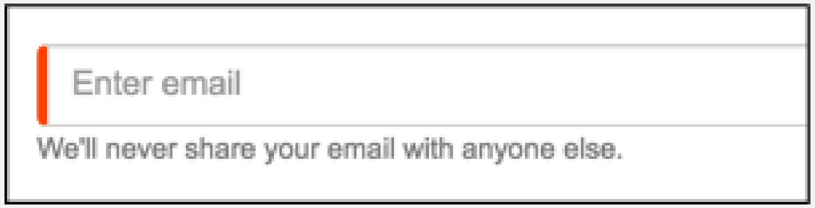
→ Initialize Default Values


peter@kassenaar.nl

We'll never share your email with anyone else.

Forms in Web Applications - Tasks

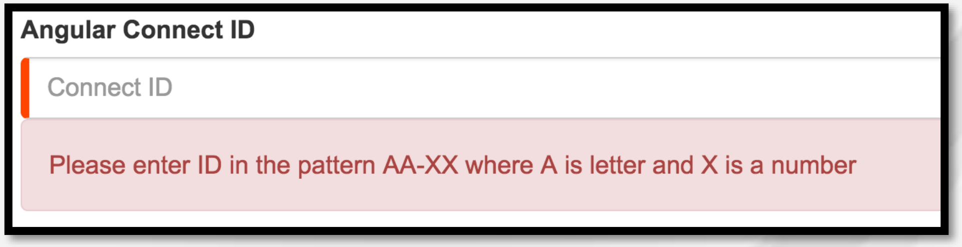
- Initialize Default Values
- Validate Data


Enter email

We'll never share your email with anyone else.

Forms in Web Applications - Tasks

- → Initialize Default Values
- → Validate Data
- → Display Validation messages



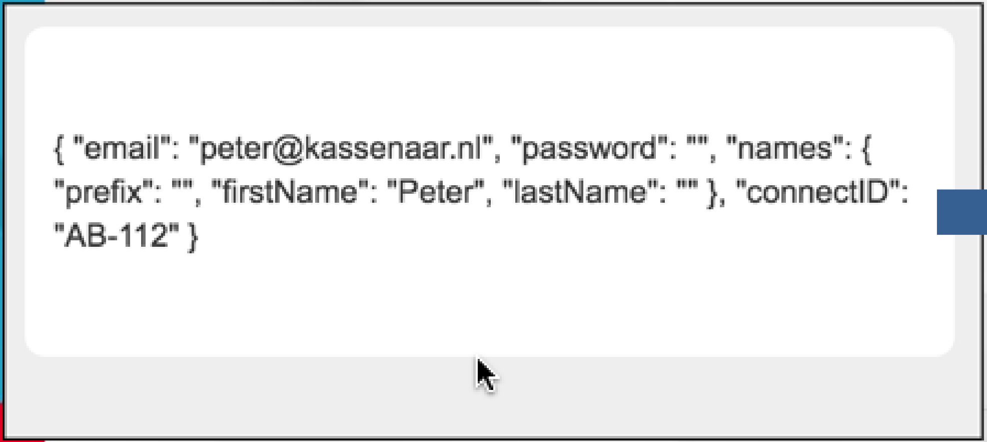
Angular Connect ID

Connect ID

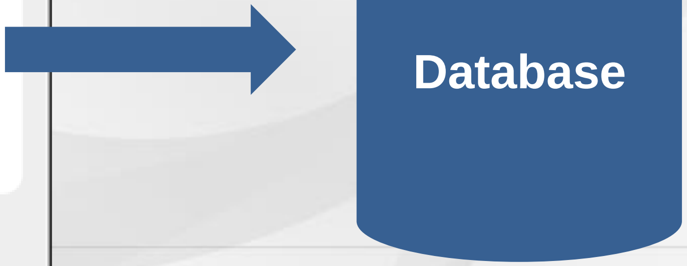
Please enter ID in the pattern AA-XX where A is letter and X is a number

Forms in Web Applications - Tasks

- → Initialize Default Values
- → Validate Data
- → Display Validation messages
- → Serialize User Data

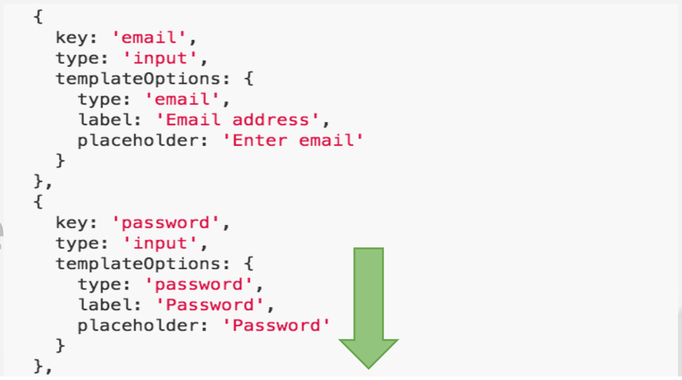


```
{ "email": "peter@kassenaar.nl", "password": "", "names": {
"prefix": "", "firstName": "Peter", "lastName": "" }, "connectID":
"AB-112" }
```

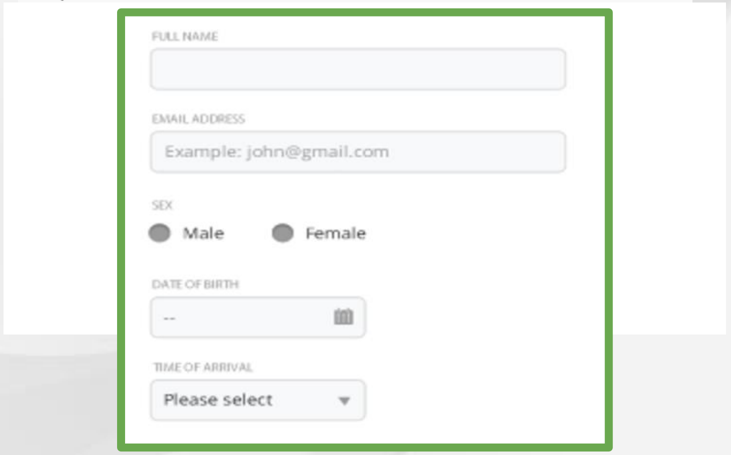


Forms in Web Applications - Tasks

- → Initialize Default Values
- → Validate Data
- → Display Validation message
- → Serialize User Data
- → Dynamic Forms & Dynamic Controls



```
{
  key: 'email',
  type: 'input',
  templateOptions: {
    type: 'email',
    label: 'Email address',
    placeholder: 'Enter email'
  }
},
{
  key: 'password',
  type: 'input',
  templateOptions: {
    type: 'password',
    label: 'Password',
    placeholder: 'Password'
  }
},
```



FULL NAME

EMAIL ADDRESS
Example: john@gmail.com

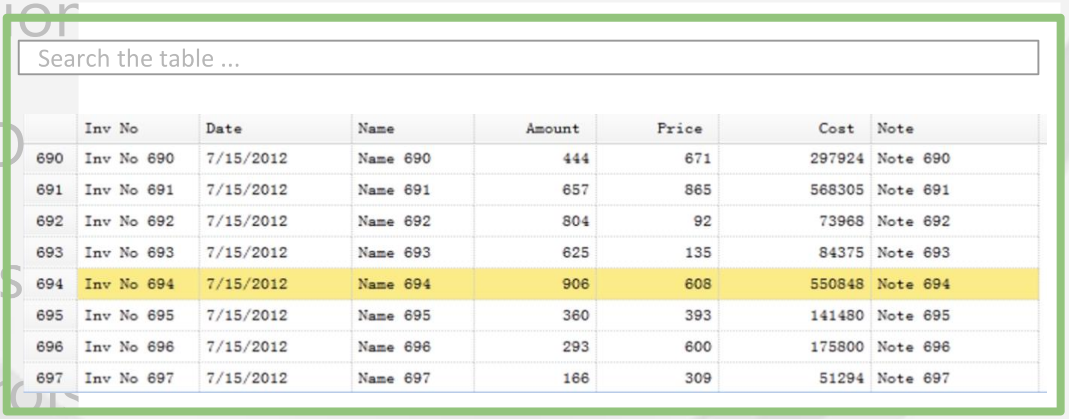
SEX
Male Female

DATE OF BIRTH
--

TIME OF ARRIVAL
Please select

Forms in Web Applications - Tasks

- Initialize Default Values
- Validate Data
- Display Validatio
- Serialize User D
- Dynamic Forms
  Dynamic Contr
- Custom Controls & Custom Validation



Search the table ...

	Inv No	Date	Name	Amount	Price	Cost	Note
690	Inv No 690	7/15/2012	Name 690	444	671	297924	Note 690
691	Inv No 691	7/15/2012	Name 691	657	865	568305	Note 691
692	Inv No 692	7/15/2012	Name 692	804	92	73968	Note 692
693	Inv No 693	7/15/2012	Name 693	625	135	84375	Note 693
694	Inv No 694	7/15/2012	Name 694	906	608	550848	Note 694
695	Inv No 695	7/15/2012	Name 695	360	393	141480	Note 695
696	Inv No 696	7/15/2012	Name 696	293	600	175800	Note 696
697	Inv No 697	7/15/2012	Name 697	166	309	51294	Note 697

Angular 2 – Types of Forms

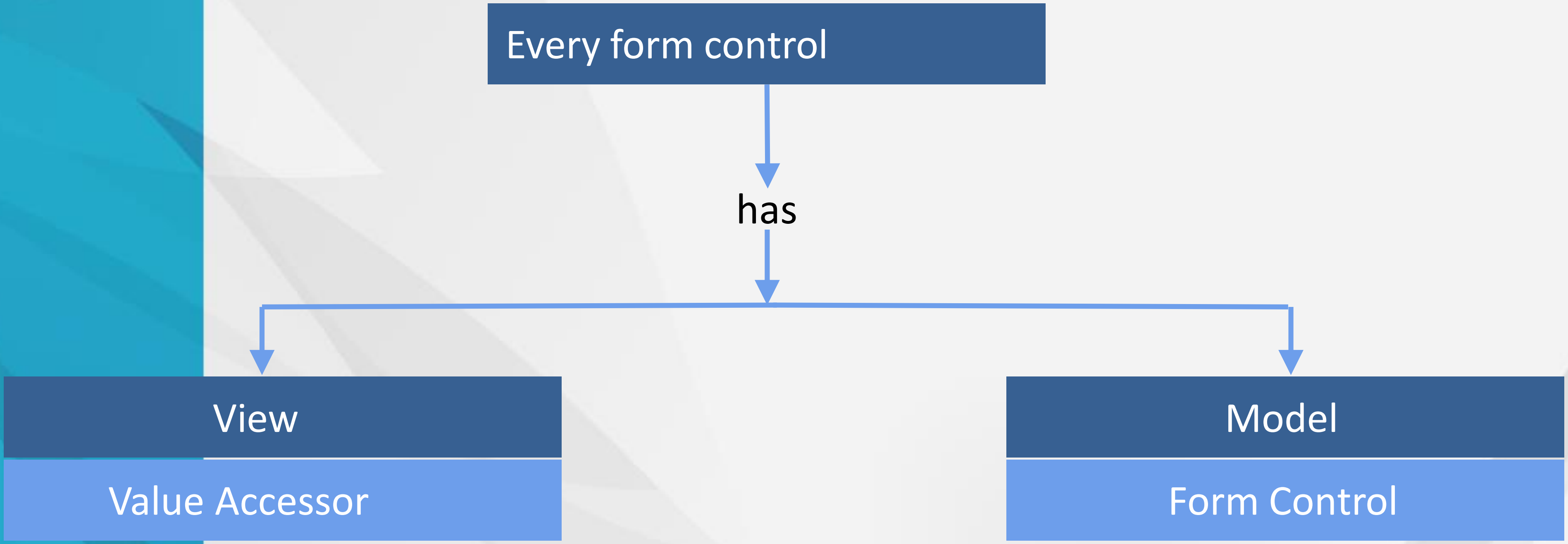
- Template Driven Forms

- Model Driven (Reactive Forms)

Angular 2 – Types of Forms

• Template Driven Forms	• Model Driven (Reactive Forms)
• Source of truth is the Template	• Source of truth is the component class / directive
• Define templates. Angular generates form model o/t fly	• Instantiate Form model and Control model yourself
• Less descriptive	• More Descriptive
• Quickly Build simple forms – Less control	• Code all the details. Takes more time, gives more control
• Less testable	• Very good testable

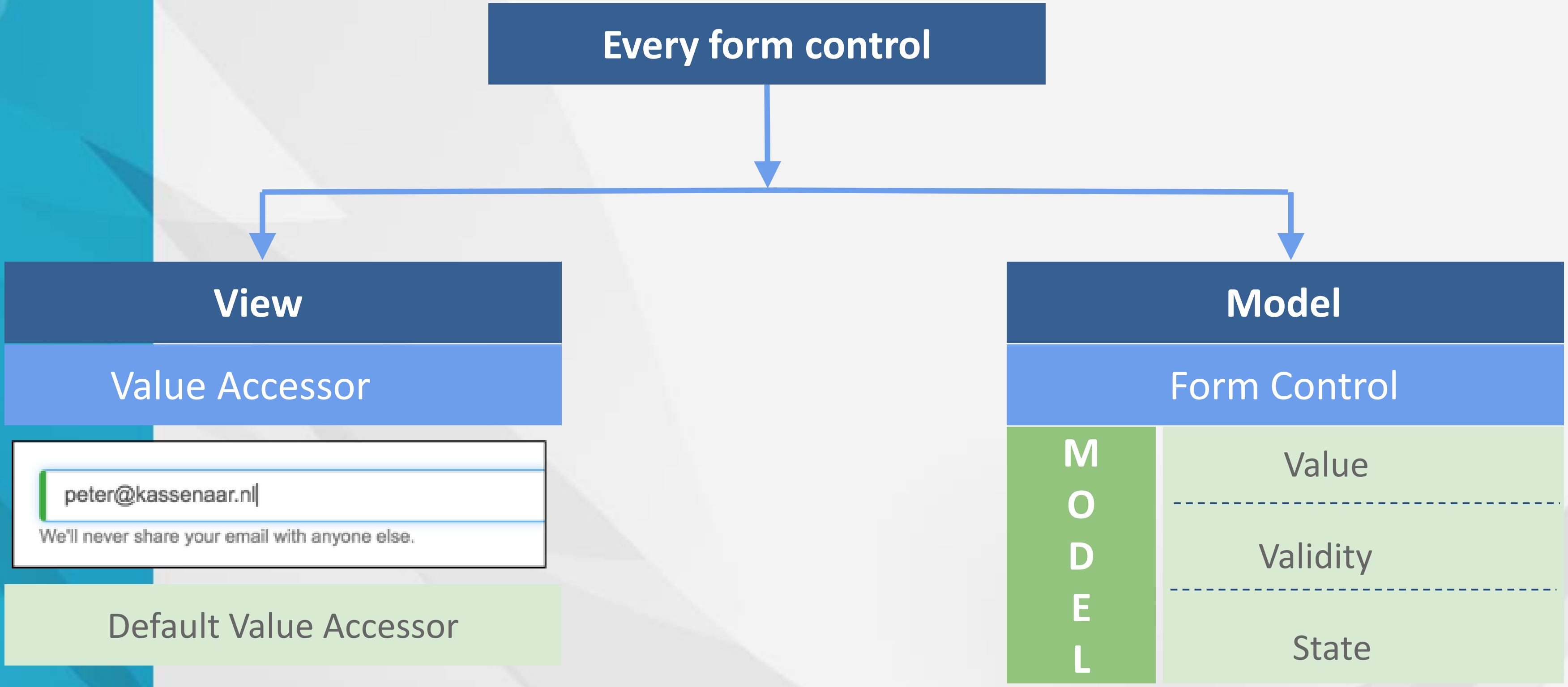
Angular 2 Forms - Fundamentals



Retrieves value from HTML controls

Maintains model in component

In more detail



peter@kassenaar.nl

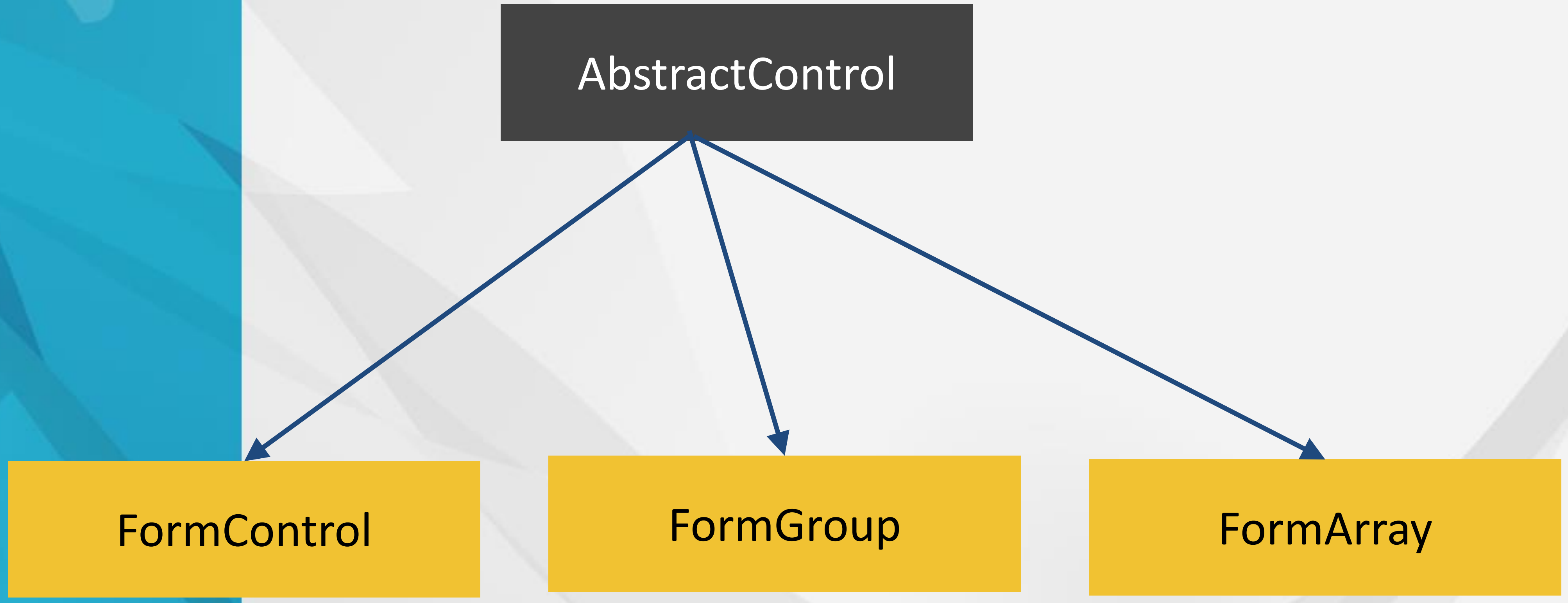
We'll never share your email with anyone else.

Angular 2 Forms - Base class

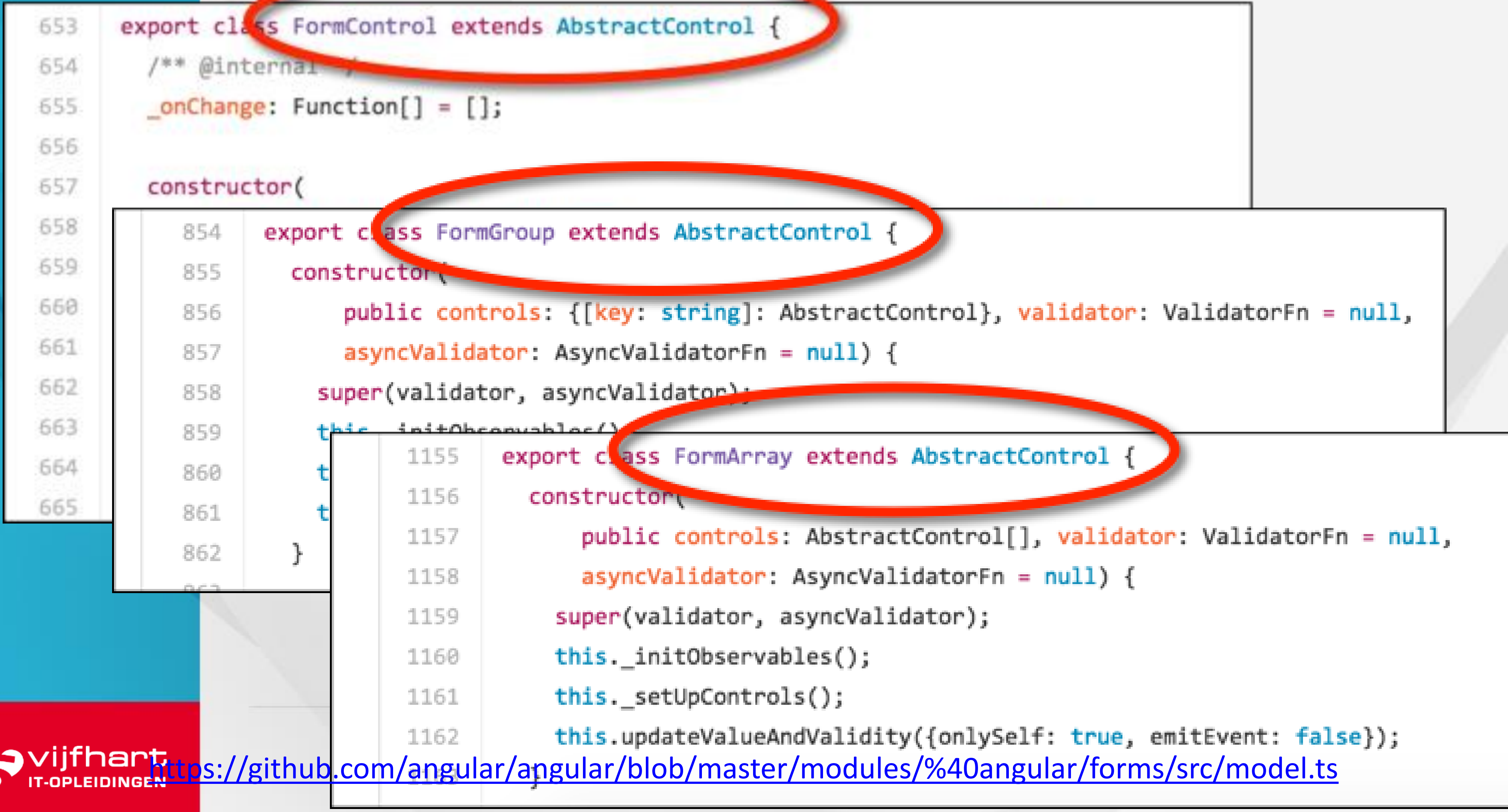
```
export abstract class AbstractControl {
    _value: any;
    …
    private _status: string;
    private _errors: {[key: string]: any};
    private _pristine: boolean = true;
    private _touched: boolean = false;
    …
    get value(): any { return this._value; }
    get valid(): boolean { return this._status === VALID; }
    …
    abstract setValue(value: any, options?: Object): void;
    …
}
```

https://github.com/angular/angular/blob/master/modules/%40angular/forms/src/model.ts

Angular 2 Forms – extended classes



Control classes in code



```
export class FormControl extends AbstractControl {
  /** @internal */
  _onChange: Function[] = [];

  constructor(
```

```
export class FormGroup extends AbstractControl {
  constructor(
      public controls: {[key: string]: AbstractControl}, validator: ValidatorFn = null,
      asyncValidator: AsyncValidatorFn = null) {
    super(validator, asyncValidator);
    this._initObservables();
    t
    t
  }
```

```
export class FormArray extends AbstractControl {
  constructor(
      public controls: AbstractControl[], validator: ValidatorFn = null,
      asyncValidator: AsyncValidatorFn = null) {
    super(validator, asyncValidator);
    this._initObservables();
    this._setUpControls();
    this.updateValueAndValidity({onlySelf: true, emitEvent: false});
  }
```

https://github.com/angular/angular/blob/master/modules/%40angular/forms/src/model.ts

Summary – what have we learned so far

1

Template Driven Forms

Less to code

2

Model Driven Forms

More to code

3

Model

State, Validity, Value

Let’s build a template driven form!

- Step 1 – Import `FormsModule` in `app.module.ts`

```
import {FormsModule} from '@angular/forms';
```

Step 2 – Add `FormsModule` to `@ngModule`

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


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


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

Step 3 – write form in HTML

```
<form novalidate>
   <div class="form-group">
      <label for="inputEmail">Email address</label>
      <input type="email" class="form-control" id="inputEmail"
            placeholder="Enter email" name="email">
      <small class="form-text text-muted">
         We'll never share your email with anyone else.
      </small>
   </div>
   <div class="form-group">
      <label for="inputPassword">Password</label>
      <input type="password" class="form-control" id="inputPassword"
            placeholder="Password" name="password">
   </div>

   <button type="submit" class="btn btn-primary">Submit</button>
</form>
```

This is just plain HTML. No Angular stuff here…

Step 4. Defining a Template Driven Form

- Add `#myForm="ngForm"` to the `<form>` tag
  - This declares a local variable with the name `#myForm` to the `<form>` element. It is of type `NgForm`
- Add `ngModel` to each and every form field
  - No value necessary

```
<form novalidate #myForm="ngForm">
   <div class="form-group">
         <input type="email" class="form-control" id="inputEmail"
            placeholder="Enter email" name="email" ngModel>
   </div>
   <div class="form-group">
         <input type="password" class="form-control" ngModel
            id="inputPassword" placeholder="Password" name="password">
   </div>
```

Just checking – Sample results pane

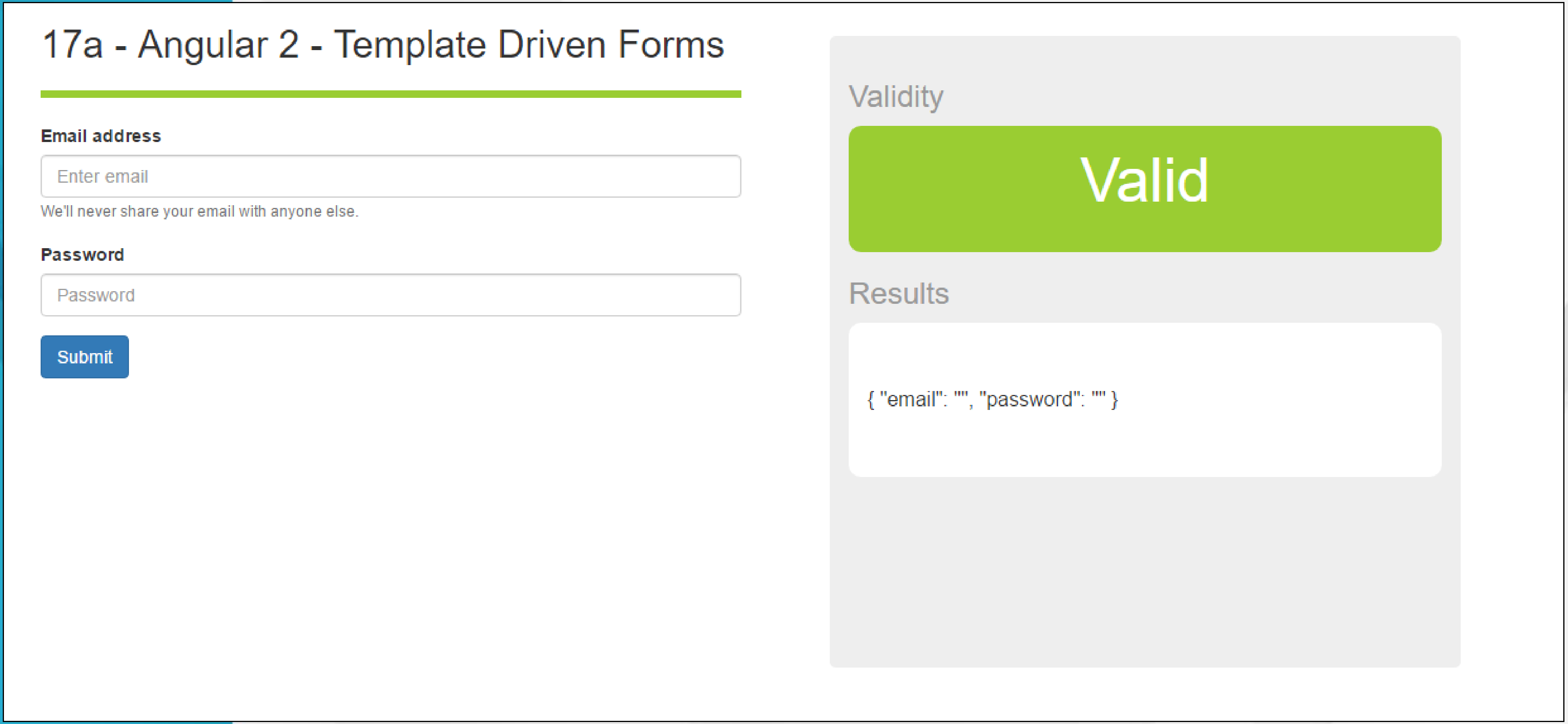
```
<div class="form-result">
   <h3>Validity</h3>
   <div class="validity" [ngClass]="{'invalid-form': !myForm.valid}">
      <div *ngIf="myForm.valid">Valid</div>
      <div *ngIf="!myForm.valid">Invalid</div>
   </div>
   <h3>Results</h3>
   <div class="result">
      {{ myForm.value | json}}
   </div>
</div>
```

Just to show runtime results of the Validity and Value of the form using

`myForm.valid`

`myForm.value`

Results so far



17a - Angular 2 - Template Driven Forms

Email address

Enter email

We'll never share your email with anyone else.

Password

Password

Validity

Valid

Results

```
{ "email": "", "password": "" }
```

Checkpoint

- The `#myForm` exposes the value and the validity of the form as a whole.
- `ngModel` adds the individual controls to the `#myForm`.
- You can now check it's value and state in the results pane
- Try what happens if you remove one of the `ngModel` directives!

- Check for yourself: the value of a form is a JSON-object.

Addressing individual controls

Retrieve values from individual controls

- Do the same as with the form
- Add for example `#email="ngModel"` to input field
- Now, the value, validity and state (i.e. its `ValueAccessors`!)

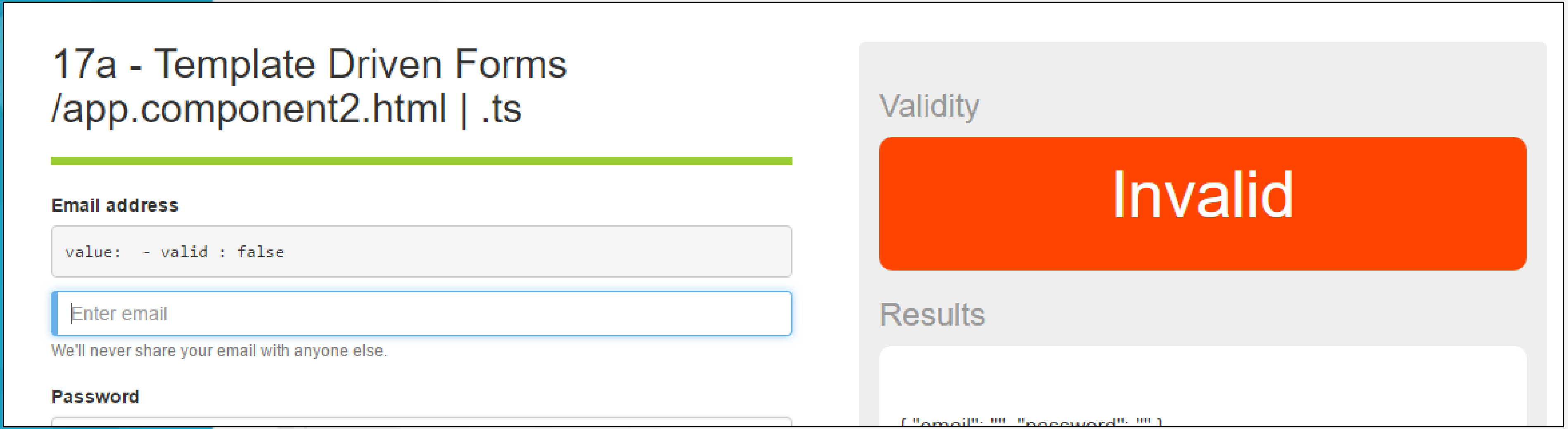
  are accessible through the local template variable

```
<label for="inputEmail">Email address</label>
<pre>value: {{ email.value }} - valid : {{ email.valid}}</pre>
<input type="email" class="form-control" id="inputEmail"
      placeholder="Enter email" name="email" ngModel #email="ngModel">
<small class="form-text text-muted">
   We'll never share your email with anyone else.
</small>
```

Required fields

- Add HTML5 attribute required to the input field.
- No checking on type yet!
  - It’s just required.

```
<input type="email" class="form-control" id="inputEmail"
      placeholder="Enter email" name="email" ngModel #email="ngModel" required>
```



17a - Template Driven Forms
/app.component2.html | .ts

Email address

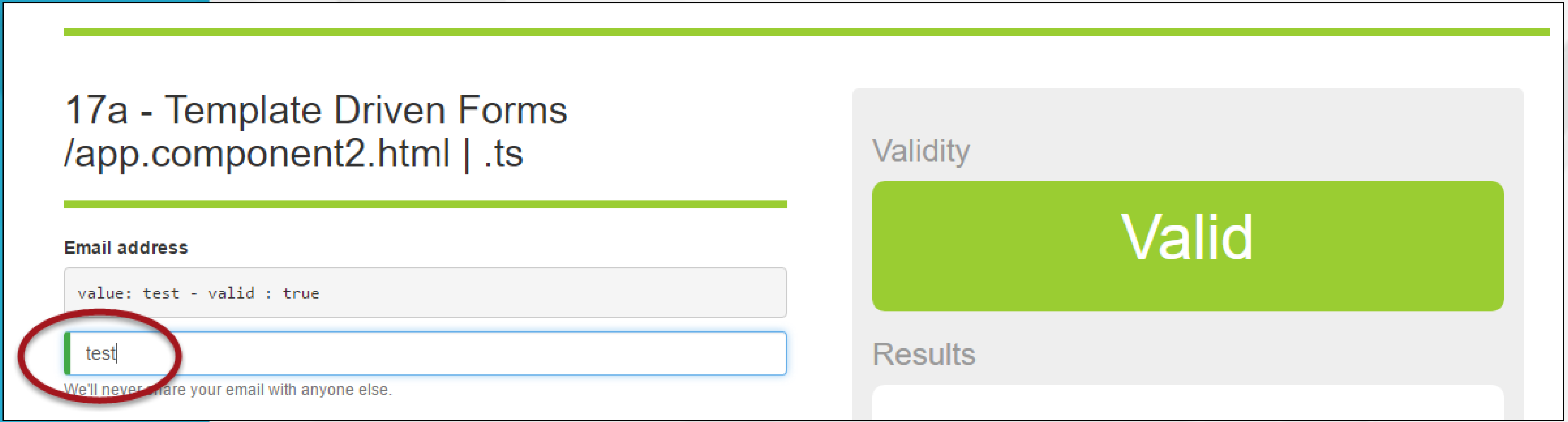
```
value:  - valid : false
```

Enter email

We'll never share your email with anyone else.

Password

```
{ "email": "", "password": "" }
```



17a - Template Driven Forms
/app.component2.html | .ts

Email address

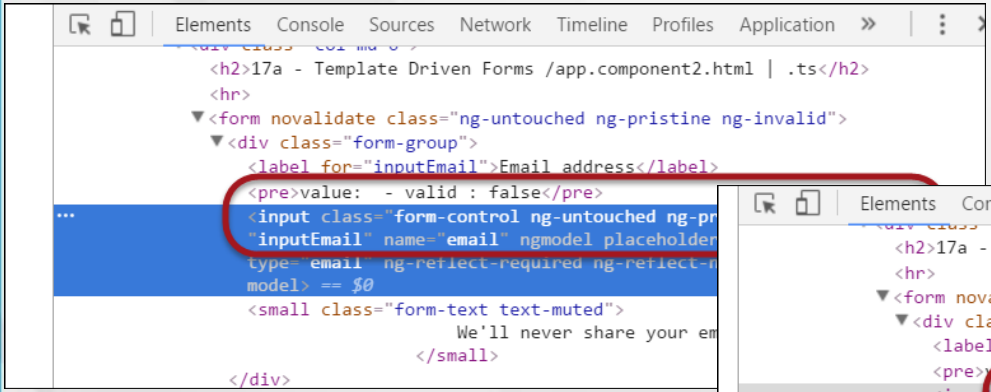
```
value: test - valid : true
```

test

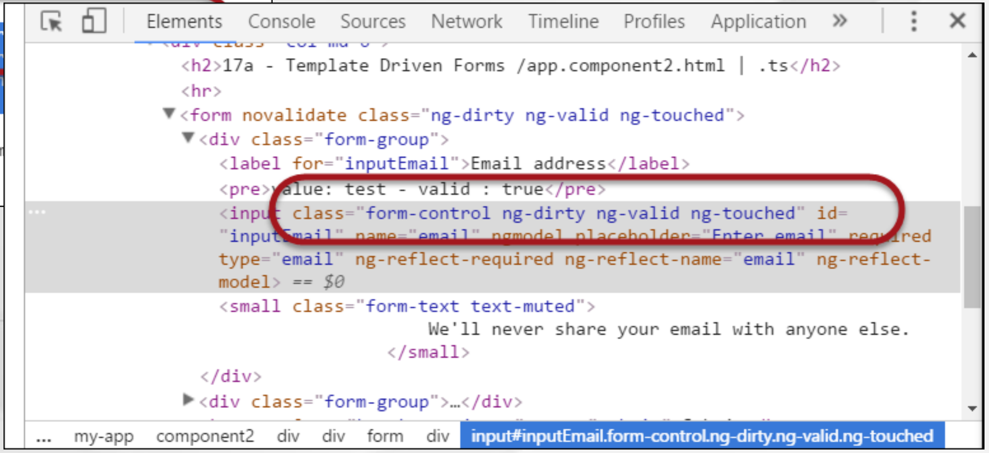
We'll never share your email with anyone else.

Angular classes and checks

- Angular adds classes to the rendered HTML to indicate state
  - `ng-untouched / ng-touched,`
  - `ng-pristine / ng-dirty`
  - `ng-invalid / ng-valid`



```
<h2>17a - Template Driven Forms /app.component2.html | .ts</h2>
<hr>
▼<form novalidate class="ng-untouched ng-pristine ng-invalid">
 ▼<div class="form-group">
    <label for="inputEmail">Email address</label>
    <pre>value:  - valid : false</pre>
    <input class="form-control ng-untouched ng-pr
    "inputEmail" name="email" ngmodel placeholder
    type="email" ng-reflect-required ng-reflect-n
    model> == $0
    <small class="form-text text-muted">
                    We'll never share your em
                 </small>
  </div>
```


Elements
Console
Sources
Network
Timeline
Profiles
Application

```
<h2>17a - Template Driven Forms /app.component2.html | .ts</h2>
<hr>
▼<form novalidate class="ng-dirty ng-valid ng-touched">
 ▼<div class="form-group">
    <label for="inputEmail">Email address</label>
    <pre>value: test - valid : true</pre>
    <input class="form-control ng-dirty ng-valid ng-touched" id=
    "inputEmail" name="email" ngmodel placeholder="Enter email" required
    type="email" ng-reflect-required ng-reflect-name="email" ng-reflect-
    model> == $0
    <small class="form-text text-muted">
                    We'll never share your email with anyone else.
                 </small>
  </div>
 ▶<div class="form-group">…</div>
```

... my-app component2 div div form div input#inputEmail.form-control.ng-dirty.ng-valid.ng-touched

Write your own CSS to define styles!

Using ngModelGroup

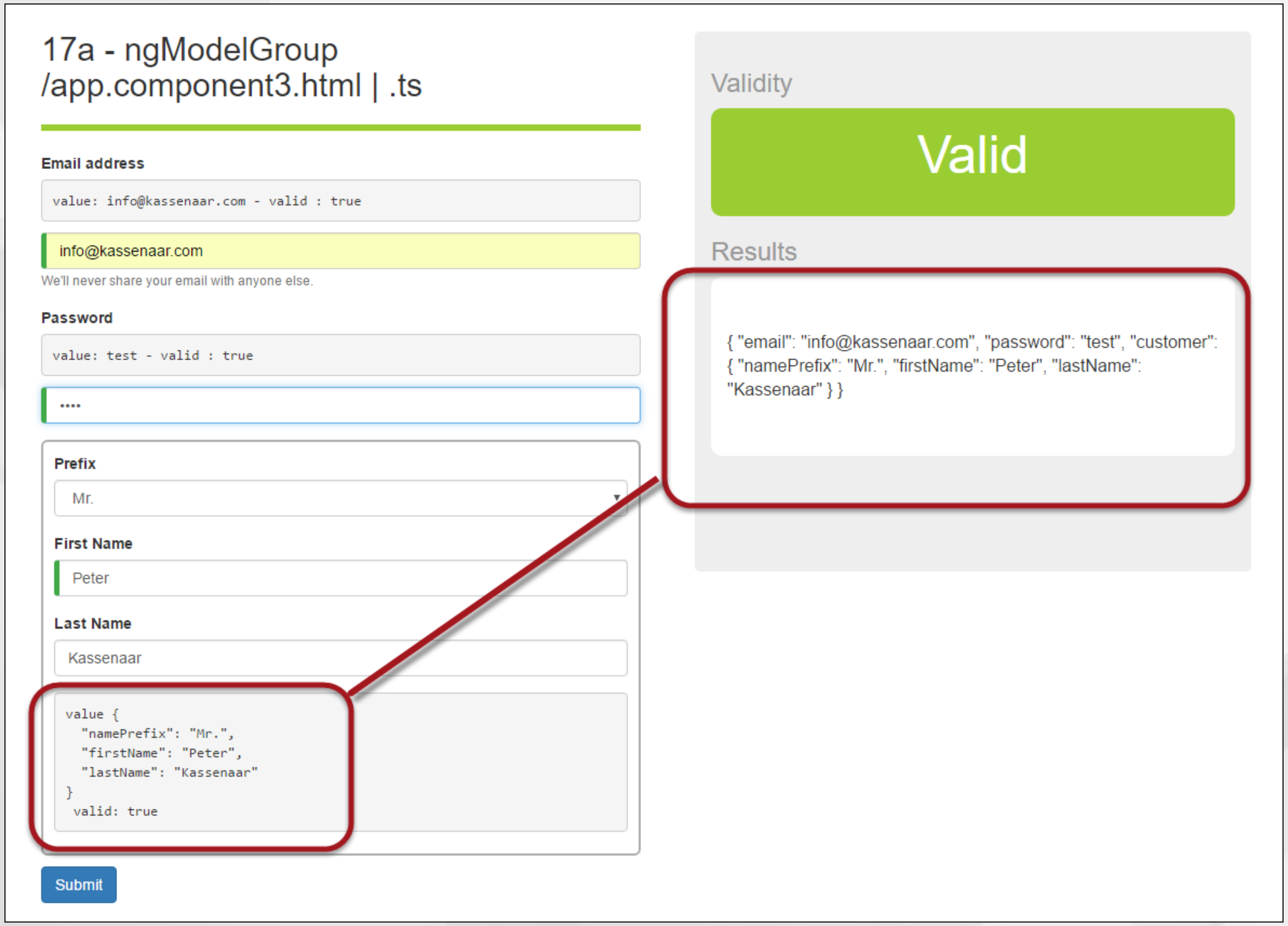
Adding ngModelGroup

→ Combining form fields into logical groups

```
<div ngModelGroup="customer" #customer="ngModelGroup">
   <div class="form-group">
      …
   </div>
</div>
```

Use a local template variable (i.e. `#customer="ngModelGroup"`) only if you want to have access to the state and validity of the group as a wole.

ngModelGroup creates a nested object



17a - ngModelGroup
/app.component3.html | .ts

Email address

```
value: info@kassenaar.com - valid : true
```

info@kassenaar.com

We'll never share your email with anyone else.

Password

```
value: test - valid : true
```

••••

Prefix

Mr.

First Name

Peter

Last Name

Kassenaar

```
value {
  "namePrefix": "Mr.",
  "firstName": "Peter",
  "lastName": "Kassenaar"
}
 valid: true
```

Submit

Validity

Valid

Results

{ "email": "info@kassenaar.com", "password": "test", "customer": { "namePrefix": "Mr.", "firstName": "Peter", "lastName": "Kassenaar" } }

Submitting forms

Define a (click) handler on the button

- Only activate the button if the form is valid
- Pass `myForm` as a parameter
- Note: no actual need for two-way databinding with `[(ngModel)]`

```
<button type="submit" class="btn btn-primary"
      (click)="onSubmit(myForm)"
      [disabled]="!myForm.valid">
   Submit
</button>
```

```
onSubmit(form){
   console.log('Form submitted: ', form.value);
   alert('Form submitted!' + JSON.stringify(form.value))
}
```

More on Template Driven Forms

I'm Todd, a Developer Advocate @Telerik. Co-Founder of @UltimateAngular Creator of the Angular 2 migration guide. JavaScript, Angular, React, conference speaker. Developer Expert at Google.

Angular 2 form fundamentals: template-driven forms

POSTED ON OCT 18, 2016 - *Edit this page on GitHub*

Angular 2 presents two different methods for creating forms, template-driven (what we were used to in Angular 1.x), or reactive. We're going to explore the absolute fundamentals of the template-driven Angular 2 forms, covering `ngForm`, `ngModel`, `ngModelGroup`, submit events, validation and error messages.

https://toddmotto.com/angular-2-forms-template-driven

Bonus (maar mooi!): Model Driven Forms

Or: *Reactive Forms*

Reactive Forms

- Based on *reactive programming* we already know
  - Events, Event Emitters
  - Observables
- Every form control is an observable!

```
export abstract class AbstractControl {

    ...
    private _valueChanges: EventEmitter<any>;
    …
    get valueChanges(): Observable<any> {
        return this._valueChanges;
    }
    ...
}
```

Differences - key things to remember

- No more `ngForm` → use `[formGroup]`
- No more `ngModel` → use `formControlName`
- Form state lives in the Component, *not* in the View
- Possible validations are in the Component, not in the View
- The view is *not* generated for you.
- You need to write the HTML yourself

Form Controls are observables

- Import & instantiate in the Component
- Build your model in `constructor` or `ngOnInit`.
- Listen to changes `(.subscribe())` and act accordingly:

```
export class AppComponent1 implements OnInit {

   myReactiveForm: FormGroup;

   constructor(private formBuilder: FormBuilder) {
   }

   ngOnInit() {
      this.myReactiveForm = this.formBuilder.group({
         email   : ``,
         password: ``
      })
   }
}
```

vijfhart IT-OPLEIDINGEN

Subscribe to those observables

```
// 1. complete form
this.myReactiveForm.valueChanges.subscribe((value)=>{
   console.log(value);
});


// 2. watch just one control
this.myReactiveForm.get('email').valueChanges.subscribe((value)=>{
   console.log(value);
});
```

Building reactive forms

Step 1 – import ReactiveFormsModule

→ app.module.ts

```
import {NgModule}       from '@angular/core';
import {BrowserModule} from '@angular/platform-browser';
import {ReactiveFormsModule} from '@angular/forms';
import …
@NgModule({
    imports      : [
      BrowserModule,
      ReactiveFormsModule,
      …
    ],
    …
})
export class AppModule {
}
```

Step 2 – use [formGroup] and formControlName

```
<form novalidate [formGroup]="myReactiveForm">
   <div class="form-group">
      <label for="inputEmail">Email address</label>
      <input type="email" class="form-control" id="inputEmail"
            placeholder="Enter email" name="email"
            formControlName="email">
   </div>
   …
   // all other controls
</form>
```

vijfhart IT-OPLEIDINGEN

Step 3 – Build your form in Component

```
export class AppComponent1 implements OnInit {
   myReactiveForm: FormGroup;
   constructor(private formBuilder: FormBuilder) {
   }
   ngOnInit() {
      // 1. Define the model of Reactive Form.
      // Notice the nested formBuilder.group() for group Customer
      this.myReactiveForm = this.formBuilder.group({
         email   : ``,
         password: ``,
         customer: this.formBuilder.group({
            prefix: ``,
            firstName: ``,
            lastName: ``
         })
      })
   }
}
```

Subscribe to changes

```
ngOnInit() {
    …

   // 2. Subscribe to changes at form level or...
   this.myReactiveForm.valueChanges.subscribe((value)=>{
      console.log('Changes at form level: ', value);
   });

   // 3. Subscribe to changes at control level.
   this.myReactiveForm.get('email').valueChanges.subscribe((value)=>{
      console.log('Changes at control level: ', value);
   });
}
```

Submitting a reactive form

- Can be based on `.valueChanges()` (though not very likely) for any given form control or complete form
- Use just `.click()` event handler for submit button

```
<button type="submit" class="btn btn-primary"
      (click)="onSubmit()"
      [disabled]="!myReactiveForm.valid">
   Submit
</button>
```

```
onSubmit() {
   console.log('Form submitted: ', this.myReactiveForm.value);
   // TODO: do something useful with form
}
```

Form Validation

1. Validating Template driven forms

Use HTML5-attributes like `required`, `pattern`, `minlength` and so on.

Under the hood, these are actually Angular directives!

Angular adds/removes corresponding classes.

```
<input type="password" class="form-control" ngModel
      id="inputPassword" placeholder="Password"
name="password"
 #pw="ngModel" required minlength="6">
```

Validating reactive forms

No more declarative attributes `required`, `minlength`, `maxlength` and so on.

Add `Validator` on the component class instead.

Configure validator per your needs.

Angular 2 built-in validators

angular/modules/@angular/forms/src/validators.ts

```
export class Validators {

    static required(control: AbstractControl): {[key: string]: boolean} {
    }

    static minLength(minLength: number): ValidatorFn {
    }
    static maxLength(maxLength: number): ValidatorFn {
    }
    static pattern(pattern: string): ValidatorFn {
    }
    static nullValidator(c: AbstractControl): {
    }
    . . .
}
```

Adding default Validators

- Adding `Validators` to class definition
  - `email     : ['', Validators.required],`
- Multiple validations? Add an array of `Validators`, using `Validators.compose()`

```
this.myReactiveForm = this.formBuilder.group({
   email    : ['', Validators.required],
   password: ['', Validators.compose([Validators.required, Validators.minLength(6)])],
   confirm: ['', Validators.compose([Validators.required, Validators.minLength(6)])],
   …
});
```

Adding Custom Validators

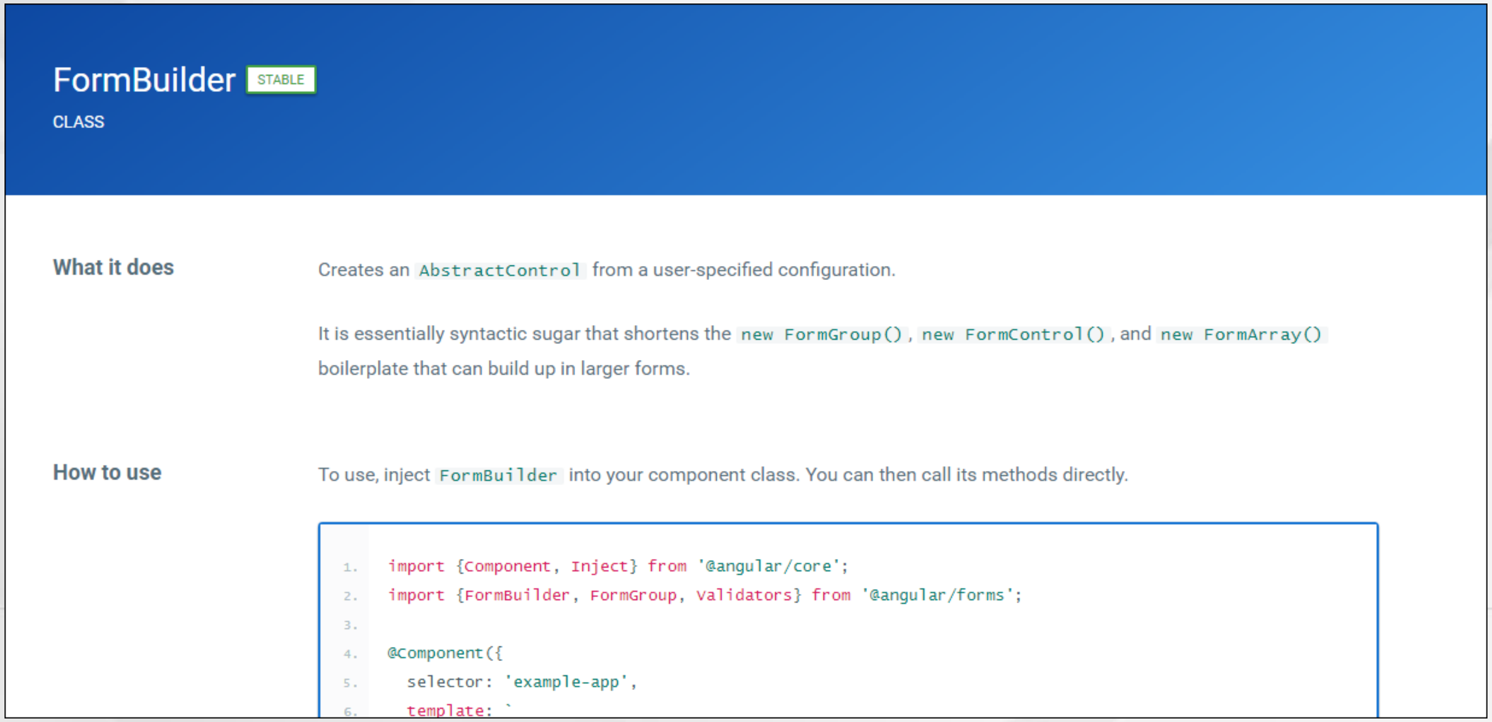
- Creating a Password-confirm validator
- Steps:
  1. Create a validation function, taking `AbstractControl` as a parameter
  2. Write your logic
  3. Don’t forget: pass the function in as a configuration parameter for the group or form you are validating!

```
function passwordMatcher(control: AbstractControl) {
   return control.get('password').value === control.get('confirm').value
      ? null : {'nomatch': true};
   // we *could*  return just true/false here, but by returning an object
   // we're more flexible in composing our validators.
}
```

```
this.myReactiveForm = this.formBuilder.group({
   email    : ['', Validators.required],
   password: ['', Validators.compose([Validators.required, Validators.minLength(6)])],
   confirm : ['', Validators.compose([Validators.required, Validators.minLength(6)])],
 },
 {validator: passwordMatcher} // pass in the validator function
);
```

More on FormBuilder class

- → https://angular.io/docs/ts/latest/api/forms/index/FormBuilder-class.html
- → Information on using and configuring FormBuilder



FormBuilder STABLE

CLASS

What it does

Creates an `AbstractControl` from a user-specified configuration.

It is essentially syntactic sugar that shortens the `new FormGroup()`, `new FormControl()`, and `new FormArray()` boilerplate that can build up in larger forms.

How to use

To use, inject `FormBuilder` into your component class. You can then call its methods directly.

```
import {Component, Inject} from '@angular/core';
import {FormBuilder, FormGroup, Validators} from '@angular/forms';

@Component({
  selector: 'example-app',
  template: `
```

Bonus Sheets: Subscribing to form events (advanced)

Working with Observables (again). Typeahead demo

Define a form

```
<form novalidate [formGroup]="searchForm">
   <div class="form-group">
      <label for="searchYouTube">Search YouTube</label>
      <input type="text" class="form-control" id="searchYouTube"
            formControlName="searchYouTube"
            placeholder="Search YouTube" name="search">
   </div>
</form>
```

Define component

→ Compose a class, subscribe to `.valueChanges()` event

```
import {Http, Response} from '@angular/http';
import {Observable} from 'rxjs/Observable'
import {FormControl, FormGroup} from "@angular/forms";
…
// import just the operators we need, not import 'rxjs/Rx'
import 'rxjs/add/operator/map';
import 'rxjs/add/operator/switchMap';
import 'rxjs/add/operator/debounceTime';

// define some constants
const BASE_URL = 'https://www.googleapis.com/youtube/v3/search';
const API_KEY  = 'AIzaSyBdi3LXzf1xWXOAVgAwNkGvjnM1TwSV4VU';
// compose a url to search for, based on a query/keyword
const makeURL = (query: string) => `${BASE_URL}?q=${query}&part=snippet&key=${API_KEY}`;
```

```
@Component({
   selector   : 'component1',
   templateUrl: 'app/component1/app.component1.html'
})
export class AppComponent1 implements OnInit {
   videos: Observable<any[]>;

   // compose our form
   searchYouTube = new FormControl();
   searchForm    = new FormGroup({
      searchYouTube: this.searchYouTube,
   });

   constructor(private http: Http) {
   }

   ngOnInit() {
      // subscribe to Youtube input textbox and bind async (see html)
      this.videos = this.searchYouTube.valueChanges
         .debounceTime(600)                  // wait for 600ms to hit the API
         .map(query => makeURL(query))         // turn keyword into a real youtube-URL
         .switchMap(url => this.http.get(url))  // wait for, and switch to the Observable that my http get call returns (more
info on switchMap, for example https://egghead.io/lessons/rxjs-starting-a-stream-with-switchmap)
         .map((res: Response) => res.json())       // map its response to json
         .map(response => response.items);     // unwrap the response and return only the items array
   }
}
```

More on Reactive Forms

I'm Todd, a Developer Advocate @Telerik. Co-Founder of @UltimateAngular Creator of the Angular 2 migration guide. JavaScript, Angular, React, conference speaker. Developer Expert at Google.

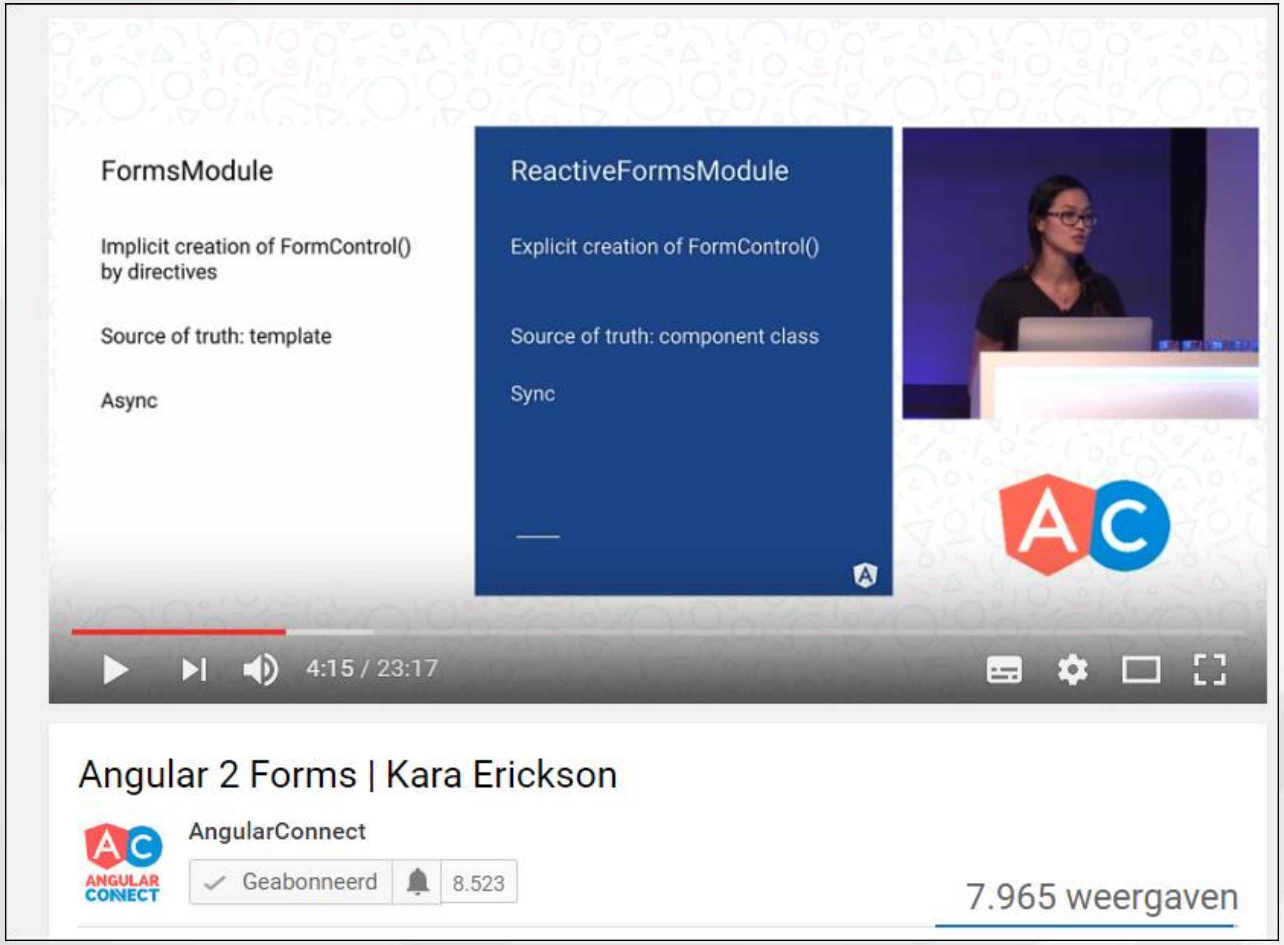
Angular 2 form fundamentals: reactive forms

POSTED ON OCT 19, 2016 - *Edit this page on GitHub*

Angular 2 presents two different methods for creating forms, template-driven (what we were used to in Angular 1.x), or reactive. We're going to explore the absolute fundamentals of the reactive Angular 2 forms, covering `ngForm`, `ngModel`, `ngModelGroup`, submit events, validation and error messages.

https://toddmotto.com/angular-2-forms-reactive

Kara Erickson on Angular Forms


FormsModule

Implicit creation of FormControl() by directives

Source of truth: template

Async

ReactiveFormsModule

Explicit creation of FormControl()

Source of truth: component class

Sync

4:15 / 23:17

Angular 2 Forms | Kara Erickson

AngularConnect

Geabonneerd 8.523

7.965 weergaven

https://www.youtube.com/watch?v=xYv9lsrV0s4