ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

Forms

ANGULARarchitects.io

Contents

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- Angular creates object graph
- FormsModule

Reactive

- App creates object graph
- More control
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Data-driven

- Angular generates form for data model
- Self-made and community solutions

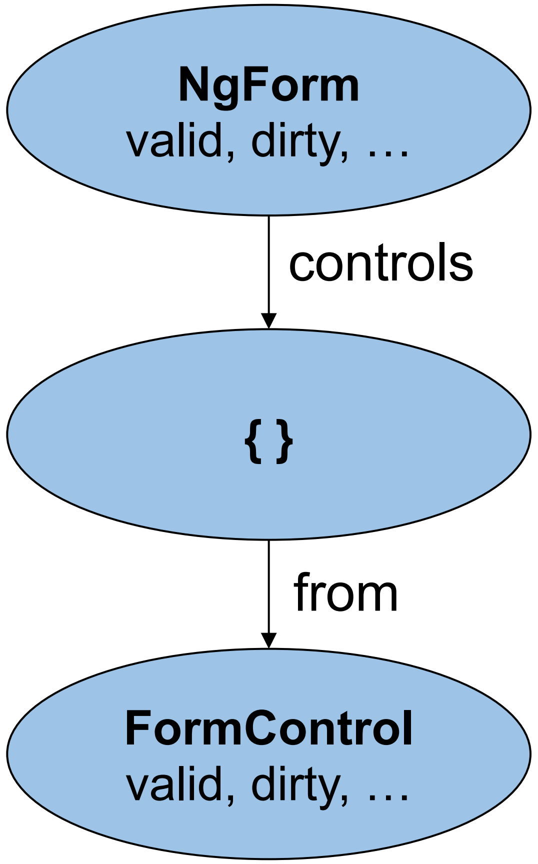
Template-driven Forms

Template-driven Forms

```
export class FlightSearchComponent {

    from: string;
    to: string;

    constructor(flightService: FlightService) {

            from = 'Graz';
            to = 'Hamburg';
    }
}
```

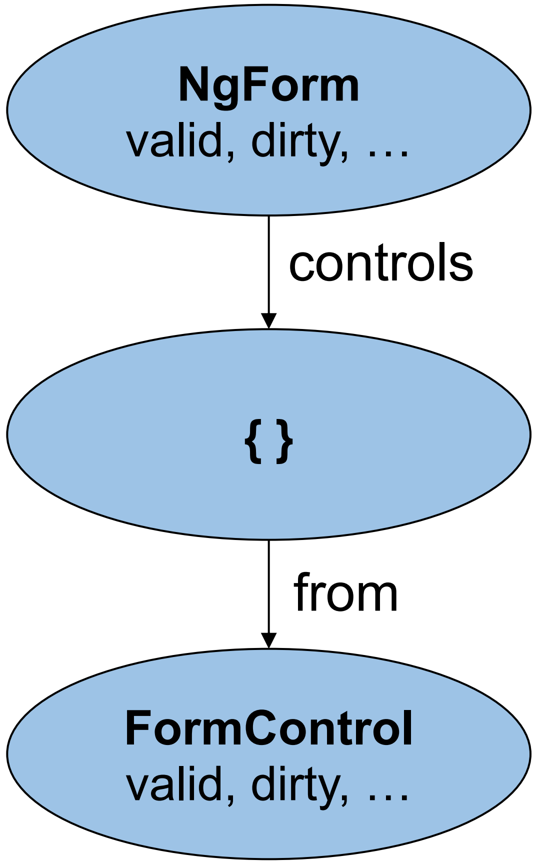
View

```
<form>

   <input type="text" name="from"
      [(ngModel)]="from" required minlength="3">

   […]

</form>
```



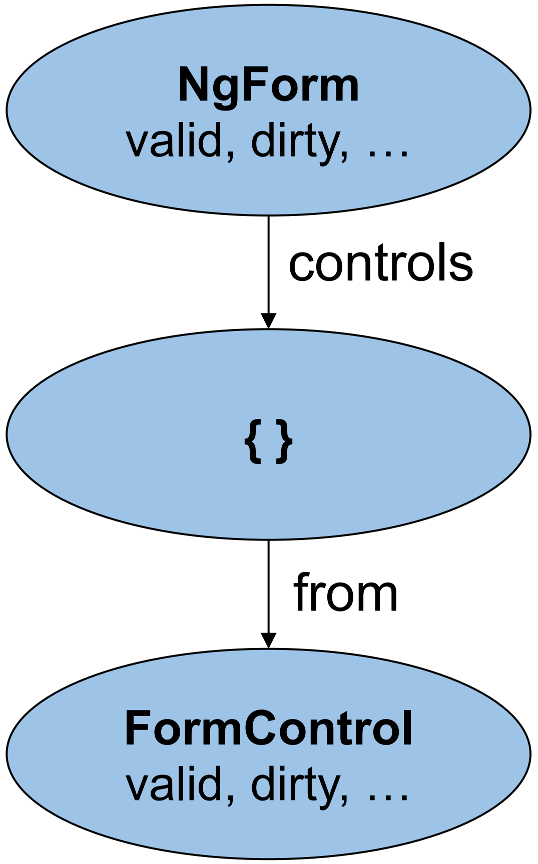
View

```
<form #f="ngForm">

    <input type="text" name="from"
        [(ngModel)]="from" required minlength="3">

    [...]

</form>
```



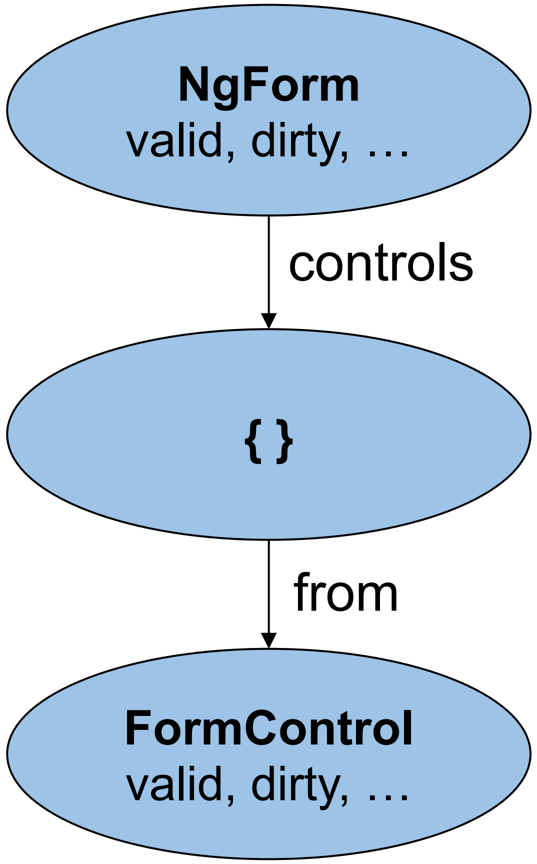
View

```
<form #f="ngForm">

    <input type="text" name="from"
        [(ngModel)]= "from" required minlength="3">

    <div *ngIf="!f.controls['from'].valid">
        …Error…
    </div>

</form>
```



View

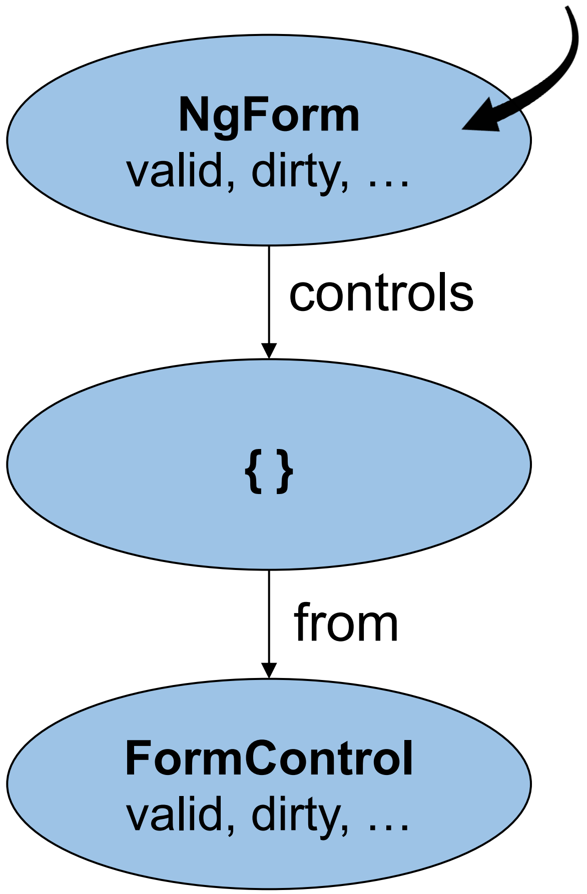
```
<form #f="ngForm">

    <input type="text" name="from"
        [(ngModel)]="from" required minlength="3">

    <div *ngIf="!f?.controls['from']?.valid">
        …Error…
    </div>

</form>
```


$$\begin{tikzcd} \text{NgForm: valid, dirty, …} \arrow[d, "\text{controls}"] \\ \{\,\} \arrow[d, "\text{from}"] \\ \text{FormControl: valid, dirty, …} \end{tikzcd}$$

View

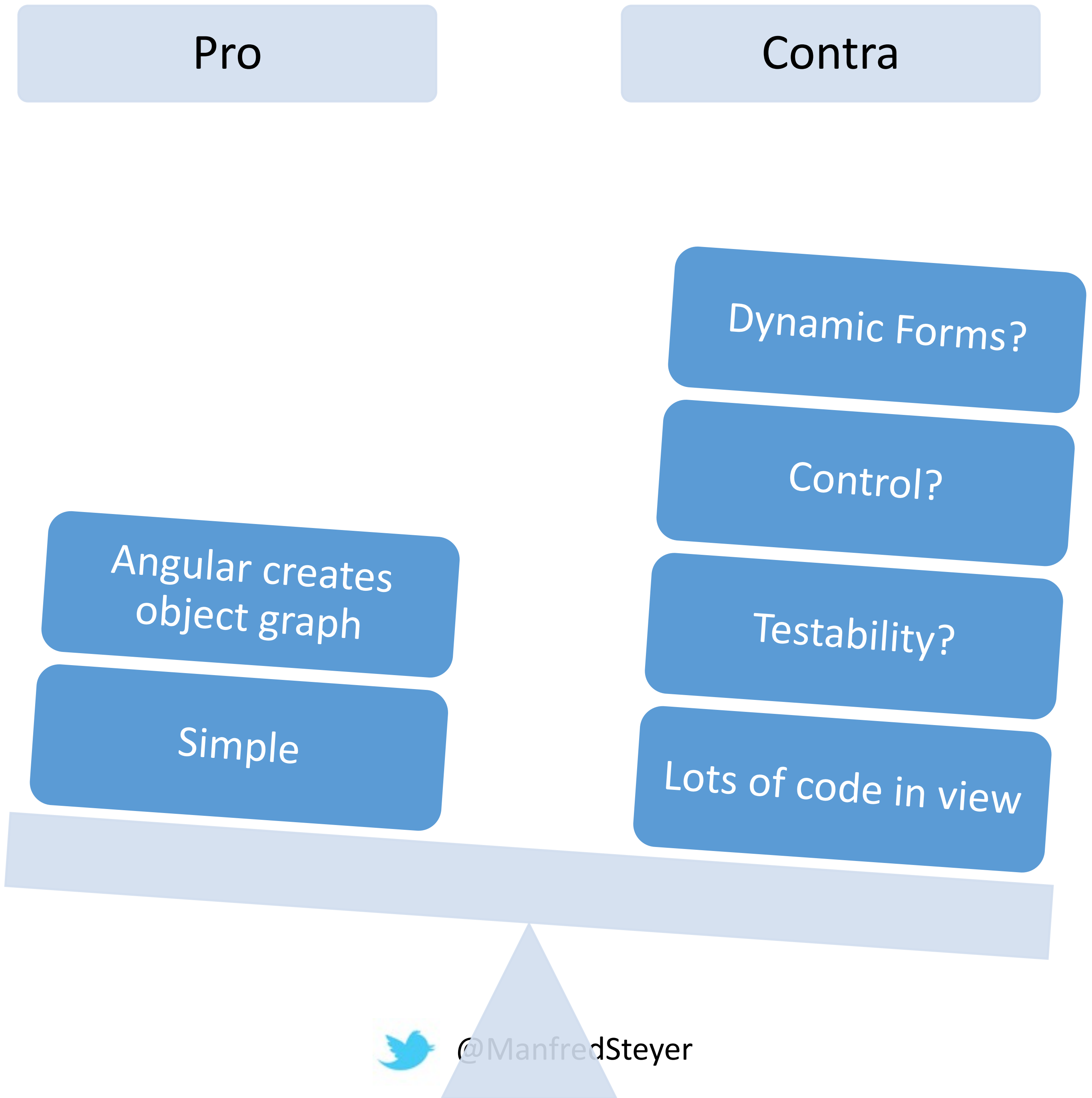
```
<form #f="ngForm">

    <input type="text" name="from"
        [(ngModel)]="from" required minlength="3">

    <div *ngIf="!f?.controls['from']?.valid">
        …Error…
    </div>

    <div
        *ngIf="f?.controls['from']?.hasError('required')">
        …Error…
    </div>
</form>
```

Wraps ControlGroup ~1:1

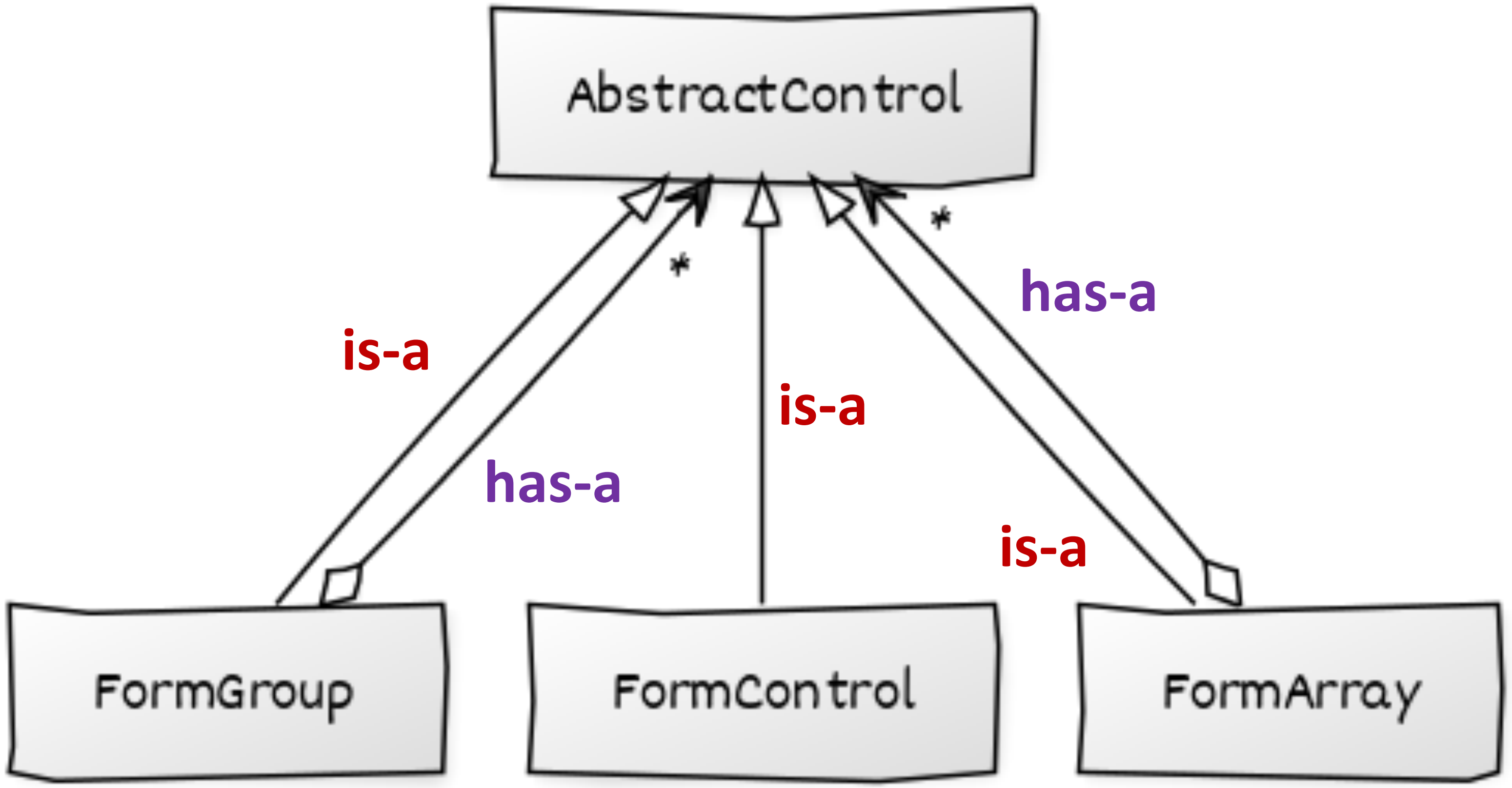


DEMO

Reactive Forms


Pro
Contra
Angular creates object graph
Simple
Dynamic Forms?
Control?
Testability?
Lots of code in view

Classes for Object Graph



ReactiveFormsModule

```
@NgModule({
   imports: [
      ReactiveFormsModule,
      CommonModule,
      SharedModule,
      [...]
   ],
   [...]
})
export class FlightBookingModule { }
```

Reactive Forms

```
export class FlightSearchComponent {

    form: FormGroup;

    […]
}
```

Reactive Forms

```
export class FlightSearchComponent {

    form: FormGroup;

    constructor(…) {
        let fromControl = new FormControl('Graz');
        let toControl = new FormControl('Hamburg');
        this.form = new FormGroup({ from: fromControl, to: toControl});

        […]

    }
}
```

Reactive Forms

```
export class FlightSearchComponent {

    form: FormGroup;

    constructor(…) {
        let fromControl = new FormControl('Graz');
        let toControl = new FormControl('Hamburg');
        this.form = new FormGroup({ from: fromControl, to: toControl});

        fromControl.validator = Validators.required;
        […]
    }
}
```

Reactive Forms

```
export class FlightSearchComponent {

    form: FormGroup;

    constructor(...) {
        let fromControl = new FormControl('Graz');
        let toControl = new FormControl('Hamburg');
        this.form = new FormGroup({ from: fromControl, to: toControl});

        fromControl.validator =
                Validators.compose([Validators.required, Validators.minLength(3)]);
    }
}
```

Reactive Forms

```
export class FlightSearchComponent {

    form: FormGroup;

    constructor(…) {
        let fromControl = new FormControl('Graz');
        let toControl = new FormControl('Hamburg');
        this.form = new FormGroup({ from: fromControl, to: toControl});

        fromControl.validator =
                    Validators.compose([Validators.required, Validators.minLength(3)]);

       fromControl.asyncValidator =
                    Validators.composeAsync([…]);
    }
}
```

FormBuilder

```
export class FlightSearchComponent {

    form: FormGroup;

    constructor(fb: FormBuilder, …) {
        this.form = fb.group({
            from: ['Graz', Validators.required],
            to: ['Hamburg', Validators.required]
        });
        […]
    }

}
```

FormBuilder

```
export class FlightSearchComponent {

    form: FormGroup;

    constructor(fb: FormBuilder, …) {
        this.form = fb.group({
            from: ['Graz', [Validators.required, Validators.minLength(3)] ],
            to: ['Hamburg', Validators.required]
        });
        […]
    }

}
```

FormBuilder

```
export class FlightSearchComponent {

    form: FormGroup;

    constructor(fb: FormBuilder, ...) {
        this.form = fb.group({
            from: ['Graz', [Validators.required, Validators.minLength(3)], [ /* asyncValidator */ ] ],
            to: ['Hamburg', Validators.required]
        });
        [...]
    }

}
```

API

```
this.form.valueChanges.subscribe(change => {
    console.debug('formular hat sich geändert', change);
});
```

```
this.form.controls['from'].valueChanges.subscribe(change => {
    console.debug('from hat sich geändert', change);
});
```

```
let fromValue = this.form.controls['from'].value;
let toValue = this.form.controls['to'].value;
```

```
let formValue = this.form.value;
```

Reactive Forms

```
<form [formGroup]="form">

    <input id="from" formControlName="from" type="text">

    [...]

</form>
```

Reactive Forms

```
<form [formGroup]="form">

    <input id="from" formControlName="from" type="text">
    <div *ngIf="!form.controls['from'].valid">…Error…</div>

    […]

</form>
```

DEMO

Reactive Validation

Reactive Validators == Functions

A First Simple Validator

```
function validate (c: AbstractControl): ValidationErrors  {
    if (c.value == 'Graz' || c.value == 'Hamburg') {
        return { };
    }
    return { city: true };
}
```

Using Validators

```
this.form = fb.group({
    from: [
        'Graz',
        [
            validate
        ],
        [
            /* asyncValidator */
        ]
    ],
    to: ['Hamburg', Validators.required]
});
```

Validators with Parameters

```
function validateWithParams(allowedCities: string[]) {

        […]

}
```

Validators with Parameters

```
function validateWithParams(allowedCities: string[]): ValidatorFn {

        […]

}
```

Validators with Parameters

```
function validateWithParams(allowedCities: string[]): ValidatorFn {

    return (c: AbstractControl): ValidationErrors => {
            […]
    };

}
```

Validators with Parameters

```
function validateWithParams(allowedCities: string[]): ValidatorFn {

    return (c: AbstractControl): ValidationErrors => {

        if (allowedCities.indexOf(c.value) > -1) {
            return { }
        }

        return { city: true };

    };
}
```

Using Validators

```
this.form = fb.group({
    from: [
        'Graz',
        [
            validateWithParams(['Graz', 'Hamburg'])
        ],
        [
            /* asyncValidator */
        ]
    ],
    to: ['Hamburg', Validators.required]
});
```

DEMO

Async Validators

```
export function cityValidatorAsync(flightService: FlightService) {

    return (control: AbstractControl): Observable<ValidationErrors> => {
        […]
        return observable;
    }
}
```

Using Async Validators

```
this.form = fb.group({
    from: [
        'Graz',
        [
            validateWithParams(['Graz', 'Hamburg'])
        ],
        [
             cityValidatorAsync(this.flightService)
        ]
    ],
    to: ['Hamburg', Validators.required]
});
```

Multifield Validators

```
export function validateMultiField([…]): ValidationFn {

    return (control: AbstractControl): ValidationErrors {

        const formGroup = control as FormGroup;

        […]
    }

};
```

Using Validators

```
this.form = fb.group({ … });
this.form.validator = validators.compose([validateMultiField([…])])
```

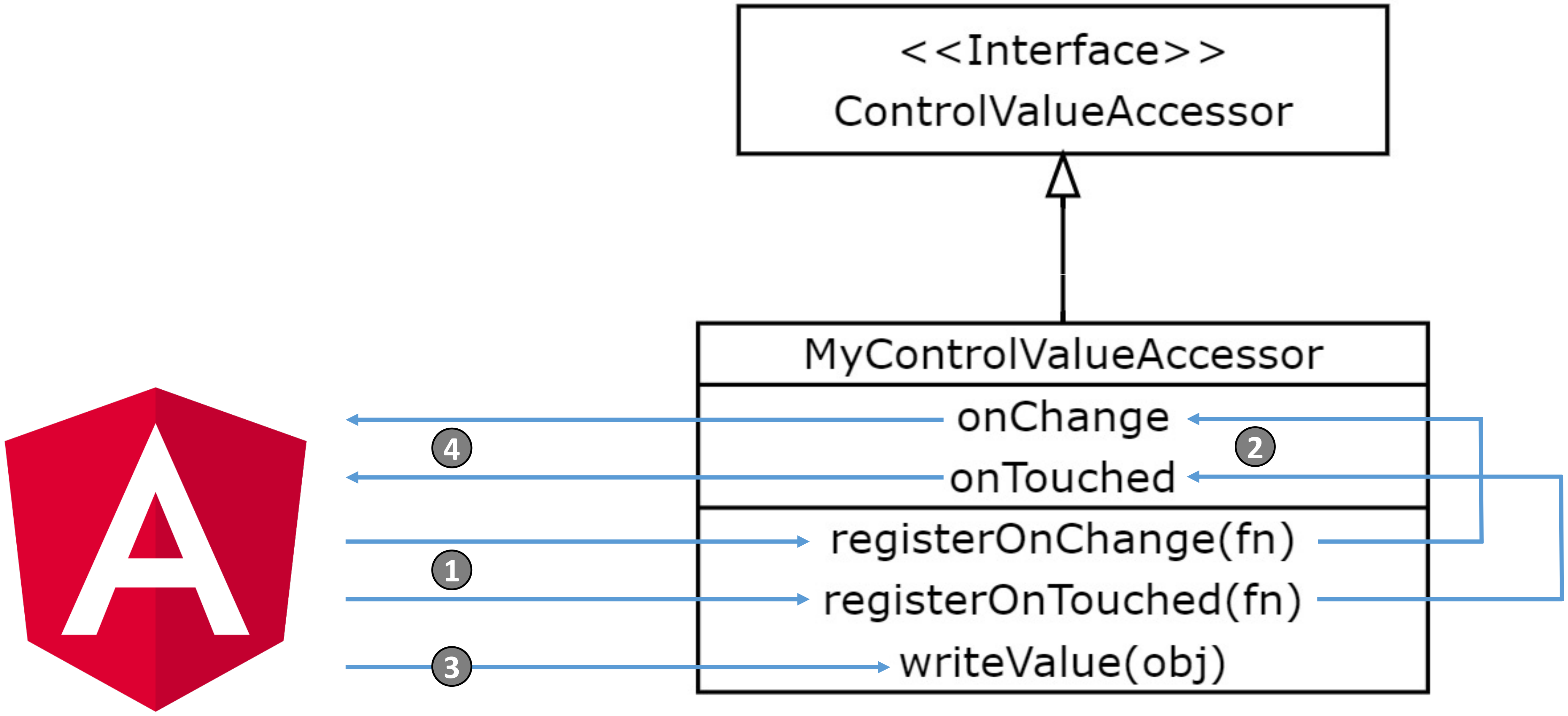
DEMO

LAB

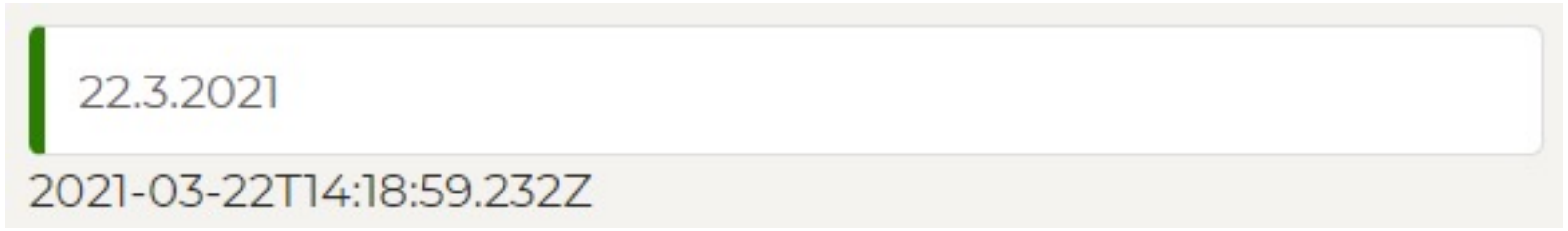
Custom Form Controls with

Control Value Accessors

ANGULAR ARCHITECTS INSIDE KNOWLEDGE


<<Interface>>
ControlValueAccessor
MyControlValueAccessor
onChange
onTouched
registerOnChange(fn)
registerOnTouched(fn)
writeValue(obj)
1
2
3
4

Case Study #3: Formatting/Parsing Dates



22.3.2021

2021-03-22T14:18:59.232Z

```
<input [(ngModel)]="date" appDate name="date">
```

DEMO

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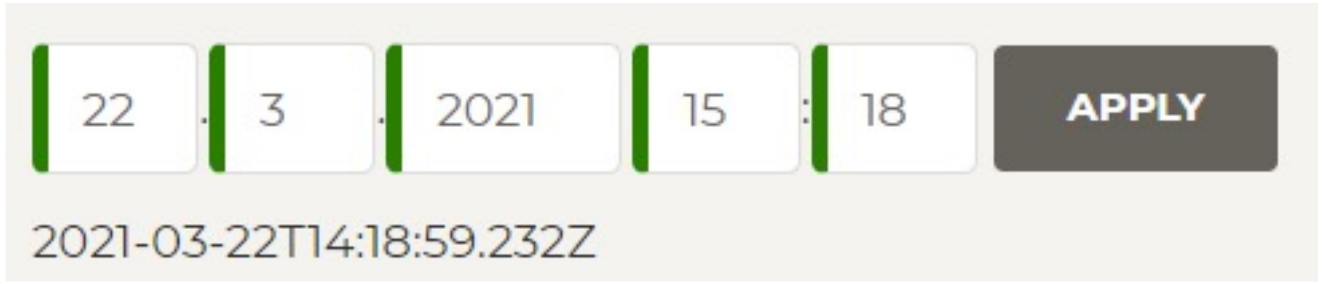
Case Study: DateControl



2021-03-22T14:18:59.232Z

```
<app-date [(ngModel)]="date"></app-date>
```

LAB

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