



Formulare und Validierung

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Inhalt

- Ansätze
- Template-getriebene Formulare
- Reaktive Formulare
- Validierung

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Ansätze in Angular

Template-getrieben

- ngModel im Template
- Angular erzeugt Objektgraph für Formular
- FormsModule

Reaktiv

- Anwendung erzeugt Objektgraph
- Mehr Kontrolle
- ReactiveFormsModule

Daten-getrieben

- Angular generiert Formular für Datenmodell
- An Community übergeben

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Template-getriebene Formulare



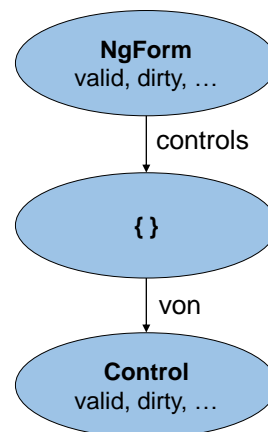
Template-getriebene Formulare

```
export class FlugSuchenComponent {
  von: string;
  nach: string;

  constructor(flugService: FlugService) {
    von = 'Graz';
    nach = 'Hamburg';
  }
}
```

View

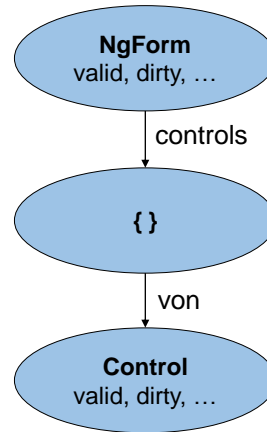
```
<form>
  <input type="text" name="von"
    [(ngModel)]="von" required minlength="3">
  [...]
</form>
```



View

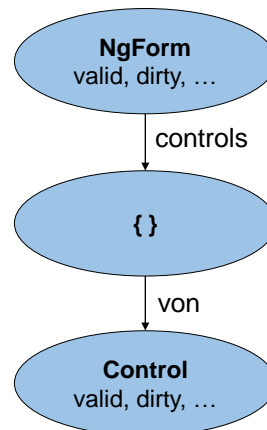


```
<form #f="ngForm">
  <input type="text" name="von"
    [(ngModel)]="von" required minlength="3">
  [...]
</form>
```



View


```
<form #f="ngForm">
  <input type="text" name="von"
    [(ngModel)]="von" required minlength="3">
  <div *ngIf="!f.controls['von'].valid">
    ...Error...
  </div>
</form>
```



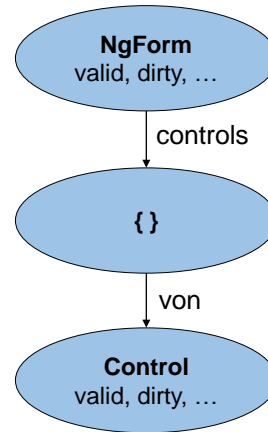
View

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

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

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

</form>
```



View

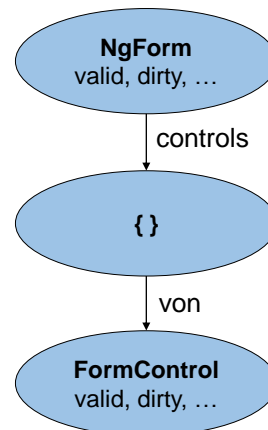
```
<form #f="ngForm">

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

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

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

</form>
```



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Eigene
Validierungs-
Regeln



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Direktiven

- Fügen Verhalten zur Seite hinzu
- Beispiel: ngModel, ngClass, ngIf, ngFor
- Kein Template im Gegensatz zu Komponenten

Validierungs-Direktive

```
<input [(ngModel)]="von" name="von" ort>
```

Validierungs-Direktive

```
@Directive({
  selector: 'input[ort]'
})
export class OrtValidatorDirective implements Validator {
  validate(c: AbstractControl): object {
    let value = c.value;
    [...]
    if (...) return { ort: true };
    return {}; // Kein Fehler
  }
}
```


Validierungs-Direktive

```
@Directive({
  selector: 'input[ort]',
  providers: [{ provide: NG_VALIDATORS,
    useExisting: OrtValidatorDirective, multi: true}]
})
export class OrtValidatorDirective implements Validator {

  validate(c: AbstractControl): object {
    let value = c.value;
    [...]
    if (...) return { ort: true }, --> .hasError('ort')
    return {}; // Kein Fehler
  }
}
```

Attribute berücksichtigen

```
<input [(ngModel)]= "von" name="von"
  [ort]="['Graz', 'Hamburg', 'Zürich']">
```

Attribute berücksichtigen

```
@Directive({
  selector: 'input[ort]',
  providers: [{ provide: NG_VALIDATORS,
    useExisting: OrtValidatorDirective,
    multi: true }]
})
export class OrtValidatorDirective implements Validator {

  @Input() ort: string[];

  validate(c: AbstractControl): object {
    [...]
  }
}
```

Attribute berücksichtigen

```
@Directive({
  selector: 'input[ort]',
  providers: [{ provide: NG_VALIDATORS,
    useExisting: OrtValidatorDirective,
    multi: true }]
})
export class OrtValidatorDirective implements Validator {

  @Input() ort: string;
  @Input() strategy: string;

  validate(c: AbstractControl): object {
    [...]
  }
}
```

Attribute berücksichtigen

```
<input [(ngModel)]= "von" name="von"  
      [ort]="['Graz', 'Hamburg', 'Zürich']" [strategy]="strict">
```

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Multi-Field-Validatoren

```
@Directive({
  selector: 'form[roundTrip]',
  providers: [ ... ]
})
export class RoundTripValidatorDirective implements Validator {

  validate(control: AbstractControl): object {
    [...]
  }
}
```

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Multi-Field-Validatoren

```
export class RoundTripValidatorDirective implements Validator {

  validate(control: AbstractControl): object {
    let group = control as FormGroup;

    let from = group.controls['from'];
    let to = group.controls['to'];

    if (!from || !to) return { };

    [...]
  }
}
```

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Multi-Field-Validatoren

```
export class RoundTripValidatorDirective implements Validator {
  validate(control: AbstractControl): object {
    let group = control as FormGroup;

    let from = group.controls['from'];
    let to = group.controls['to'];

    if (!from || !to) return { };

    if (from.value === to.value) return { roundTrip: true };

    return { };
  }
}
```

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Asynchrone Validierungs-Direktiven

```
@Directive({
  selector: 'input[asyncCity]',
  providers: [ ... ]
})
export class AsyncCityValidatorDirective {

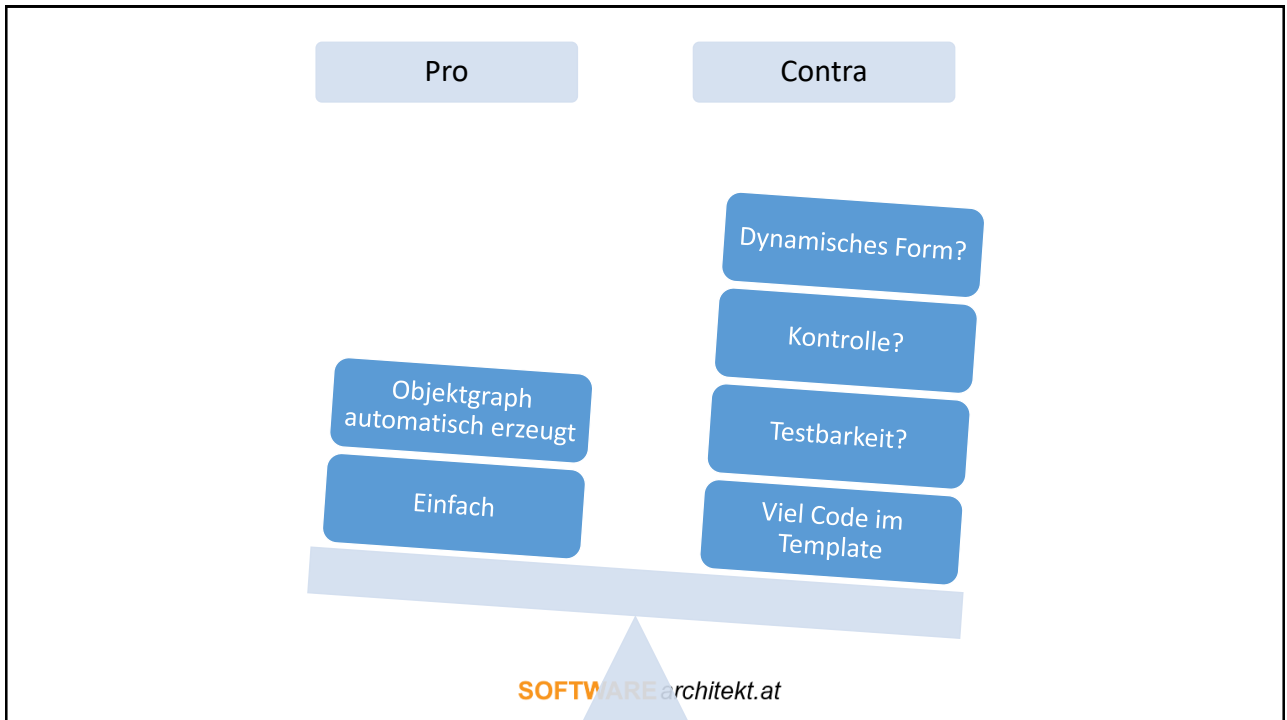
  validate(control: AbstractControl): Observable<object> {
    [...]
  }

}
```

Asynchrone Validierungs-Direktiven

Token: NG_ASYNC_VALIDATORS

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Reaktive
Formulare



ReactiveFormsModule

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

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Reaktive Formulare

```
export class FlugSuchenComponent {  
  form: FormGroup;  
  [...]  
}
```

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Reaktive Formulare

```
export class FlugSuchenComponent {

  form: FormGroup;

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

    [...]

  }
}
```



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Reaktive Formulare

```
export class FlugSuchenComponent {

  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;
    [...]

  }
}
```

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Reaktive Formulare

```
export class FlugSuchenComponent {

  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.require, Validators.minLength(3)]);
  }
}
```

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Reaktive Formulare

```
export class FlugSuchenComponent {

  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.require, Validators.minLength(3)]);

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

FormBuilder

```
export class FlugSuchenComponent {

  form: FormGroup;

  constructor(fb: FormBuilder, ...) {
    this.form = fb.group({
      von: ['Graz', Validators.required],
      nach: ['Hamburg', Validators.required]
    });
    [...]
  }
}
```



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FormBuilder

```
export class FlugSuchenComponent {

  form: FormGroup;

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

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FormBuilder

```
export class FlugSuchenComponent {

  form: FormGroup;

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

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API

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

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

```
let fromValue = this.form.controls['von'].value;
let toValue = this.form.controls['nach'].value;
```

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

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Reaktive Formulare

```
<form [formGroup]="form">  
  <input id="from" formControlName="von" type="text">  
  [...]  
</form>
```

Reaktive Formulare

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

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Validatoren
für reaktive
Formulare



Reaktive Validatoren == Funktionen

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Ein einfacher Validator

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

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Validatoren anwenden

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

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Parametrisierte Validatoren

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

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Parametrisierte Validatoren

```
function validateWithParams(allowedCities: string[]) {  
    return (c: AbstractControl): object => {  
        [...]  
    };  
}
```

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Parametrisierte Validatoren

```
function validateWithParams(allowedCities: string[]) {  
    return (c: AbstractControl): object => {  
        if (allowedCities.indexOf(c.value) > -1) {  
            return { }  
        }  
        return { city: true };  
    };  
}
```

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Validatoren anwenden

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

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