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Directives Deep Dive

ANGULARarchitects.io

Contents

Directives

- „Components without Templates“
- Add behavior to an element
- Examples: ngModel, ngClass, ngStyle

Attribute Directives

Case Study

```
<button appClickWithWarning>Delete</button>
```

Simple Example

```
@Directive({
  selector: '[appClickWithWarning]'
})
export class ClickWithWarningDirective implements OnInit {

  constructor(private elementRef: ElementRef) { }

  ngOnInit(): void {
      this.elementRef
            .nativeElement.setAttribute('class', 'btn btn-danger');
  }
}
```

Calling a Directive

```
<button appClickWithWarning>Delete</button>
```

Host-Element

Bindings

```
@Directive({
  selector: '[appClickWithWarning]'
})
export class ClickWithWarningDirective implements OnInit {

  @Input() warning = 'Are you sure?';
  @Output() appClickWithWarning = new EventEmitter();

}
```

Bindings

```
@Directive({
  selector: '[appClickWithWarning]'
})
export class ClickWithWarningDirective implements OnInit {

  @Input() warning = 'Are you sure?';
  @Output() appClickWithWarning = new EventEmitter();

  @HostBinding('class') classBinding = 'btn btn-danger';

}
```

Bindings

```
@Directive({
  selector: '[appClickWithWarning]'
})
export class ClickWithWarningDirective implements OnInit {

  @Input() warning = 'Are you sure?';
  @Output() appClickWithWarning = new EventEmitter();

  @HostBinding('class') classBinding = 'btn btn-danger';

  @HostListener('click', ['$event'])
  handleClick($event: MouseEvent): void { … }

}
```

Calling the Directive

```
<button (appClickWithWarning)="delete()" message="Sure?">Delete</button>
```

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Templates and ViewContainers

Example: Tooltip

```
<input [appTooltip]="tmpl">   <-- ViewContainer

<ng-template #tmpl>
    <h3>2 Tips for Success</h3>
    <ol>
        <li>Don't tell everything!</li>
    </ol>
</ng-template>
```

Implementation

```
@Directive({
  selector: '[appTooltip]'
})
export class TooltipDirective implements OnInit {

  @Input('appTooltip') template: TemplateRef<unknown>;

  constructor(private host: ElementRef,
              private viewContainer: ViewContainerRef) { }

  ngOnInit(): void {
    this.viewContainer.createEmbeddedView(this.template);
  }

}
```

Implementation

```
export class TooltipDirective implements OnInit {

  private viewRef: EmbeddedViewRef<unknown>;
  @Input('appTooltip') template: TemplateRef<unknown>;

  constructor(
      private host: ElementRef,
      private viewContainer: ViewContainerRef) { }

  ngOnInit(): void {
     this.viewRef = this.viewContainer.createEmbeddedView(this.template);
     […]
  }

}
```

Mouse-Events

```
const elm = this.host.nativeElement as HTMLElement;

elm.addEventListener('mouseover', () => {
   […]
});

elm.addEventListener('mouseout', () => {
   […]
});
```

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Iterate over Projected Root Nodes

```
this.viewRef.rootNodes.forEach(nativeElement => {
    nativeElement.hidden = true;
});
```

```
<input [appTooltip]="tmpl">

<ng-template #tmpl>
    <h3>2 Tips for Success</h3>
    <ol>
        <li>Don't tell everything!</li>
    </ol>
</ng-template>
```

Root Nodes

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Adding Templates and Components on the Fly

ViewContainer

- createEmbeddedView
- createComponent

TemplateOutletDirective

Insert Template in Placeholder

```
<div *templateOutlet="tmpl"></div>
<ng-template #tmpl>Hallo Welt!</ng-template>
```

ComponentOutletDirective

Insert Component in Placeholder

```
<div *componentOutlet="FlightSearchComponent"></div>
```

ContentChildren

- **@ContentChildren**(MyComponentOrDirective,
  { read: ElementRef | ViewContainerRef })
- Same for @ContentChild, @ViewChildren, @ViewChild

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Structural Directives

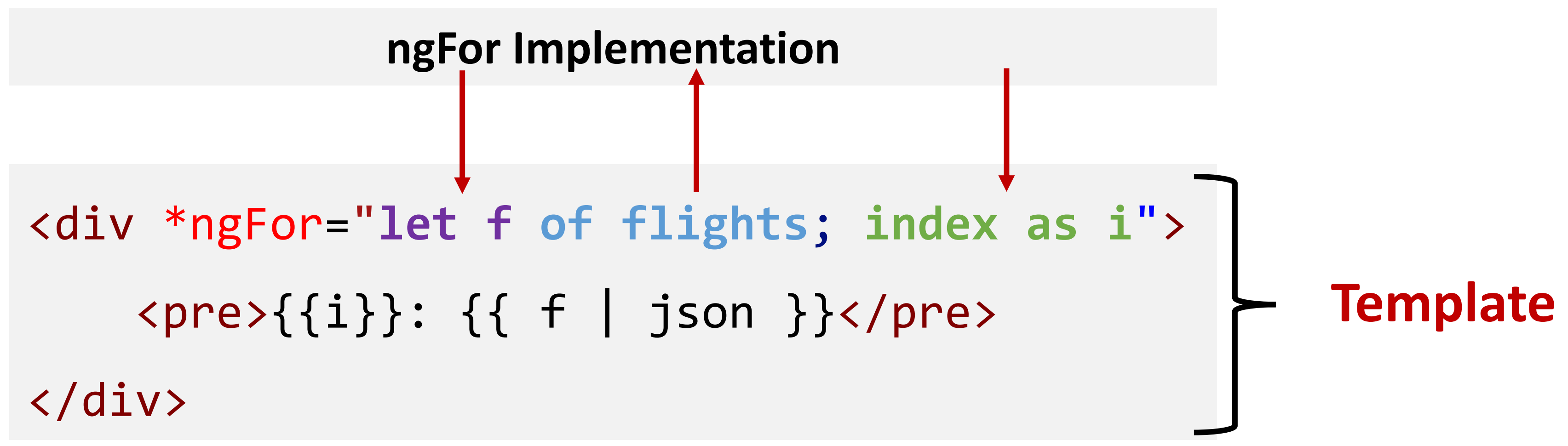
Structural Directive

Micro Syntax

```
<div *ngFor="let f of flights; index as i">
    <pre>{{i}}: {{ f | json }}</pre>
</div>
```

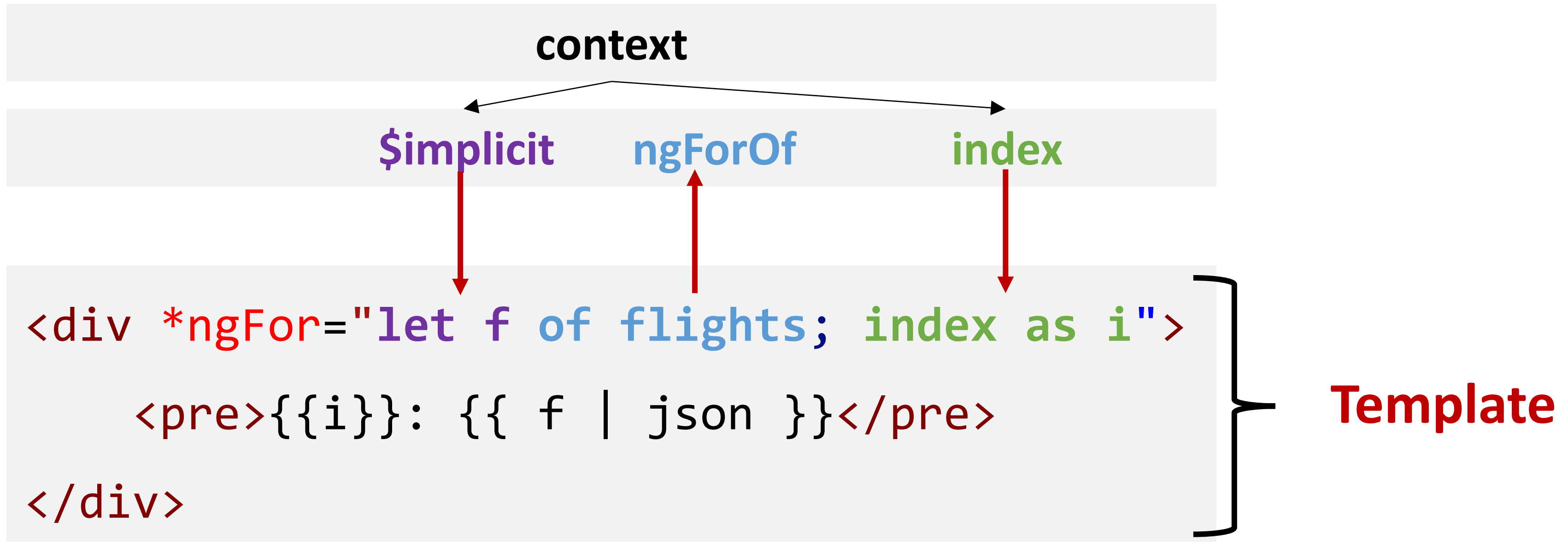
Template

Structural Directive



```
<div *ngFor="let f of flights; index as i">
    <pre>{{i}}: {{ f | json }}</pre>
</div>
```

Structural Directive



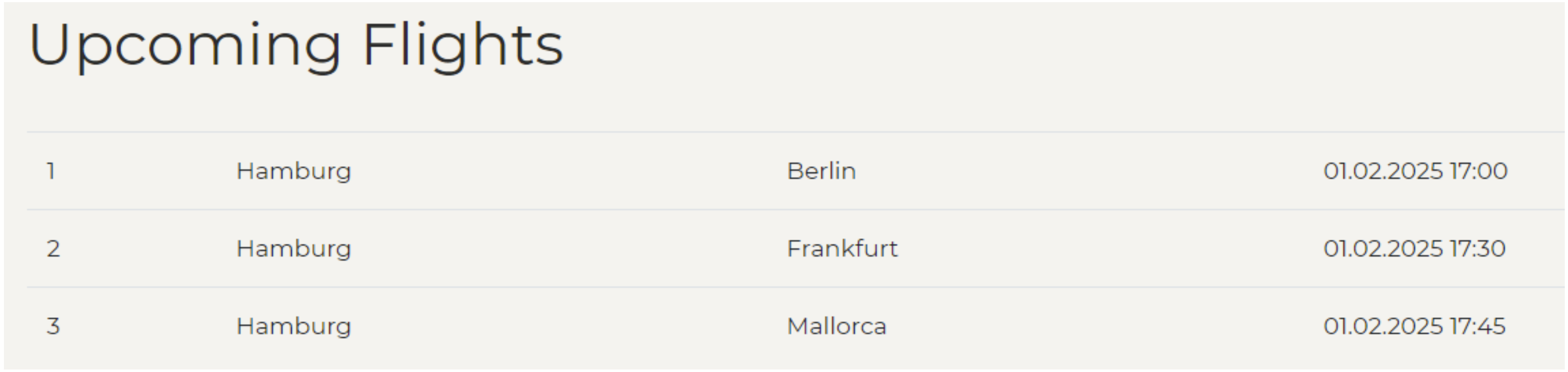
```
<div *ngFor="let f of flights; index as i">
    <pre>{{i}}: {{ f | json }}</pre>
</div>
```

Syntax Sugar

```
<div *ngFor="let f of flights; index as i">
    <pre>{{i}}: {{ f | json }}</pre>
</div>
```

```
<ng-template ngFor let-f [ngForOf]="flights" let-i="index">
    <div>
        <pre>{{i}}: {{ f | json }}</pre>
    </div>
</ng-template>
```

Case Study #2: DataTable



Upcoming Flights

1	Hamburg	Berlin	01.02.2025 17:00
2	Hamburg	Frankfurt	01.02.2025 17:30
3	Hamburg	Mallorca	01.02.2025 17:45

DataTable

```
<app-data-table [data]="flights">
    <div *appTableField="let data as 'id'">{{data}}</div>
    <div *appTableField="let data as 'from'">{{data}}</div>
    <div *appTableField="let data as 'to'">{{data}}</div>
    <div *appTableField="let data as 'date'">
        {{data | date:'dd.MM.yyyy HH:mm'}}
    </div>
</app-data-table>
```

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Summary

- Attribute Directive with Input, Output, HostBinding, HostListener
- ElementRef, TemplateRef, ViewContrainerRef
- *ngComponentOutlet, *ngTemplateOutlet
- Struktruelle Direktive: Template + Micro Syntax