**Angular Learning - Week 2 (28 JUL - 3 AUG)**

### 📅 Topics Covered in Week 2 (Phase 2)

* Structural Directives
* Attribute Directives
* DOM Manipulation through Directives
* Data Binding (All Types)
* Interpolation
* Property Binding
* Event Binding
* Two-Way Binding

## 1. Structural Directives

Structural directives **change the DOM layout** by adding or removing elements.

### Built-in Examples:

* \*ngIf → conditionally display elements
* \*ngFor → loop through data
* \*ngSwitch → multiple conditional views

### Example:

<!-- \*ngIf -->  
<p \*ngIf="isLoggedIn">Welcome back!</p>  
  
<!-- \*ngFor -->  
<ul>  
 <li \*ngFor="let todo of todos">{{ todo.title }}</li>  
</ul>

## 2. Attribute Directives

Attribute directives **change appearance or behavior** of DOM elements.

### Examples:

* ngClass
* ngStyle

<p [ngClass]="{ 'active': isActive }">Styled Text</p>  
<p [ngStyle]="{ 'color': isOnline ? 'green' : 'red' }">Online Status</p>

### Custom Directive Example:

@Directive({ selector: '[appHighlight]' })  
export class HighlightDirective {  
 constructor(el: ElementRef) {  
 el.nativeElement.style.backgroundColor = 'yellow';  
 }  
}

Use in template:

<p appHighlight>This is highlighted</p>

## 3. DOM Manipulation with Directives

Use ElementRef (unsafe) or Renderer2 (safe & recommended):

constructor(private el: ElementRef, private renderer: Renderer2) {  
 this.renderer.setStyle(this.el.nativeElement, 'border', '1px solid blue');  
}

## 4. Data Binding Overview

Angular uses **binding** to sync data between class and template.

### Four Types:

1. **Interpolation** ({{ title }})
2. **Property Binding** ([value])
3. **Event Binding** ((click))
4. **Two-Way Binding** ([(ngModel)])

## 5. Interpolation

Displays class data in the view.

<h1>{{ title }}</h1>

export class AppComponent {  
 title = 'Angular Binding';  
}

## 6. Property Binding

Sets DOM properties dynamically.

<input [value]="username" />

username = 'Alyan';

## 7. Event Binding

Responds to user actions.

<button (click)="greet()">Say Hello</button>

greet() {  
 alert('Hello!');  
}

## 8. Two-Way Binding

Syncs data **both ways** using [(ngModel)]. Requires importing FormsModule.

<input [(ngModel)]="message" />  
<p>Your message: {{ message }}</p>

message = '';

In app.module.ts:

import { FormsModule } from '@angular/forms';  
@NgModule({ imports: [FormsModule] })

## 🔮 Tricky Interview Questions:

1. **What’s the difference between Structural & Attribute Directives?**
   * Structural modifies layout (\*ngIf), attribute modifies behavior/style (ngClass).
2. **Can you create a custom directive that changes color on hover?**
   * Yes, using @HostListener and Renderer2.
3. **Why is Renderer2 preferred over ElementRef?**
   * It’s safer and works across platforms.
4. **What does [(ngModel)]="value" actually mean?**
   * It combines [value]="value" and (input)="value = $event"
5. **Can you use \*ngFor and \*ngIf on the same element?**
   * No, use <ng-container> as a wrapper.

## 📈 Week 2 Exercise: Live Character Counter

### Goal:

* Type in input field
* Show character count in real-time

### Code:

<input [(ngModel)]="userInput" placeholder="Type here..." />  
<p>Length: {{ userInput.length }}</p>

userInput = '';

Would you like to start Phase 3: Forms (Template-driven & Reactive)?