

Directives that use microtemplates are known as *structural directives*

Attribute directives are classes that are able to modify the behavior or appearance of the element they are applied to.

Structural directives change the layout of the HTML document by adding and removing elements

***ngIf = "expression"**

The ngIf directive is used to include an element and its content in the HTML document if the expression evaluates as true. The asterisk before the directive name indicates that this is a micro-template directive

```
<div *ngIf="true">Ovoj div ke se pojavi ako epresijata e true</div>
```

***ngFor = "let item of items; let i = index; let odd = odd; let first = first; let last = last"**

The ngFor directive is used to generate the same set of elements for each object in an array. The asterisk before the directive name indicates that this is a micro-template directive

```
<div *ngFor="#item of expr"> </div>
```

For the expression itself, there are two distinct parts, joined with the of keyword. The right-hand part of the expression provides the data source that will be enumerated

The left-hand side of the ngFor expression defines a *template variable*, denoted by the let keyword, which is how data is passed between elements within an Angular template.

Using Other Template Variables

The most important template variable is the one that refers to the data object being processed, which is `item` in the previous example. But the `ngFor` directive supports a range of other values that can also be assigned to variables and then referred to within the nested HTML elements, as described in Table 13-4 and demonstrated in the sections that follow.

Table 13-4. *The ngFor Local Template Values*

Name	Description
<code>index</code>	This number value is assigned to the position of the current object.
<code>odd</code>	This boolean value returns <code>true</code> if the current object has an odd-numbered position in the data source.
<code>even</code>	This boolean value returns <code>true</code> if the current object has an even-numbered position in the data source.
<code>first</code>	This boolean value returns <code>true</code> if the current object is the first one in the data source.
<code>last</code>	This boolean value returns <code>true</code> if the current object is the last one in the data source.

`[(ngModel)]` = "`item.complete`"

`[ngSwitch]` = "`expression` "

The `ngSwitch` directive is used to choose between multiple elements to include in the HTML document based on the result of an expression, which is then compared to the result of the individual expressions defined using `ngSwitchCase` directives. If none of the `ngSwitchCase` values matches, then the element to which the `ngSwitchDefault` directive has been applied will be used. The asterisks before the `ngSwitchCase` and `ngSwitchDefault` directives indicate they are micro-template directives

```
<div [ngSwitch]="expr">
  <span *ngSwitchCase="expr"> </span>
  <span *ngSwitchDefault> </span>
</div>
```

`*ngSwitchCase` = "`expression`"

`*ngSwitchDefault`

`[ngClass]` = " '`someclass` ' "

`[ngStyle]` = "{ '`font-style`': `styleExp` }"

`[ngTemplateOutlet]` = "`titleTemplate`"

The `ngTemplateOutlet` directive is used to repeat a block of content at a specified location, which can be useful when you need to generate the same content in different places and want to avoid duplication

```
<ng-template #titleTemplate>
<h4 class="p-2 bg-success text-white">Repeated Content</h4>
</ng-template>
<ng-template [ngTemplateOutlet]="titleTemplate"> </ng-template>
some elements
<ng-template [ngTemplateOutlet]="titleTemplate"> </ng-template>
```

`[(ngModel)]="selectedProduct"`

Behind the scenes, an event binding is applied to the input event, and a property binding is applied to the value property

Events Binding

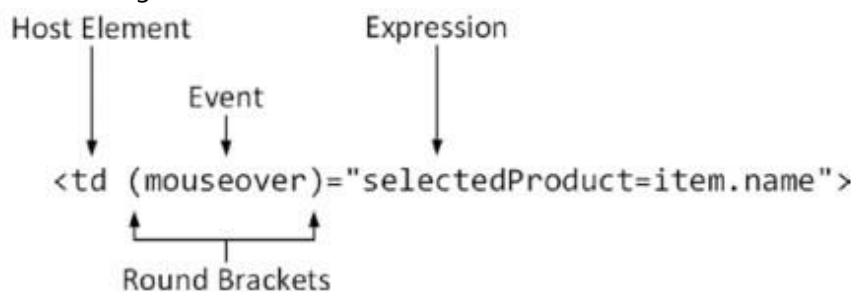


Figure 14-3. The anatomy of an event binding

An event binding has these four parts:

- The *host element* is the source of events for the binding.
- The *round brackets* tell Angular that this is an event binding, which is a form of one-way binding where data flows from the element to the rest of the application.
- The *event* specifies which event the binding is for.
- The *expression* is evaluated when the event is triggered.

Event bindings evaluate an expression when an event is triggered

Enabling forms support Add the `@angular/forms` module to the application

Responding to an event Use an event binding

Getting details of an event Use the `$event` object

Referring to elements in the template Define template variables

Events:

`(mouseover)`

`(change)`

`(ngSubmit)`

`(click)`

`(input)`

the input event is triggered every time the content in the input element is changed

(keyup)

the keyup event is a standard dom event, and the result is that application is updated as the user releases each key while typing in the input element

Table 14-3. *The Properties Common to All DOM Event Objects*

Name	Description
type	This property returns a string that identifies the type of event that has been triggered.
target	This property returns the object that triggered the event, which will generally be the object that represents the HTML element in the DOM.
timeStamp	This property returns a number that contains the time that the event was triggered, expressed as milliseconds since January 1, 1970.

Template reference variables are a

form of template variable that can be used to refer to elements *within* the template

Reference variables are defined using the # character, followed by the variable name.

```
<div *ngIf="hero" class="name">{{hero.name}}</div>
```

```
<table class="table table-striped table-bordered table-sm">
```

```
  <thead>
```

```
    <tr>
```

```
      <th>#</th>
```

```
      <th>Description</th>
```

```
      <th>Done</th>
```

```
    </tr>
```

```
  </thead>
```

```
  <tbody>
```

```
    <tr *ngFor="let item of items; let i = index">
```

```
      <td>{{ i + 1 }}</td>
```

```
      <td>{{ item.task }}</td>
```

```
      <td><input type="checkbox" [(ngModel)]="item.complete" /></td>
```

```
      Before using the ngModel directive in a two-
```

way data binding, you must import the FormsModule and add it to the NgModule's imports list.

```
      <td [ngSwitch]="item.complete">
```

```
        <span *ngSwitchCase="true">Yes</span>
```

```
        <span *ngSwitchDefault>No</span>
```

```
      </td>
```

```
    </tr>
```

```
  </tbody>
```

```
</table>
```

```
<input class="form-control" placeholder="Enter task here" #todoText />
```

```

//template reference variable
<button class="btn btn-primary mt-1" (click)="addItem(todoText.value)"></button>
//get the value with help of /template reference variable
ili
<button class="btn btn-primary mt-
1" [value]=" 'some value' " (click)="addItem($event.target.value)"></button>

addItem(value)
value ke bide some value

ili

<tr *ngFor="let item of items; let i = index" (click)="addItem(item)>

```

```

<select class="form-control" [value]="productsPerPage"
(change)="changePageSize($event.target.value)">
<option value="3">3 per Page</option>
<option value="4">4 per Page</option>
<option value="6">6 per Page</option>
<option value="8">8 per Page</option>
</select>

```

```

<input type="number" class="form-control-sm"
style="width:5em"
[value]="line.quantity"
(change)="cart.updateQuantity(line.product,
$event.target.value)" />

```

```

<input class="form-control" [value]="model.getProduct(1)?.name || 'None'" />

```

...

If the result from the getProduct method isn't null, then the expression will read the value of the name property and use it as the result. But if the result from the method is null, then the name property won't be read, and the null coalescing operator (the || characters) will set the result to None instead.

Bootstrap and JQuery

1.

```
npm install --save bootstrap jquery
```

2. in angular.json add

```
"styles": [  
  "src/styles.css",  
  
  "node_modules/bootstrap/dist/css/bootstrap.min.css"  
],  
"scripts": [  
  "node_modules/jquery/dist/jquery.min.js",  
  "node_modules/bootstrap/dist/js/bootstrap.min.js"  
]
```

iii

```
npm install bootstrap@4.4.1
```

vo style

```
"node_modules/bootstrap/dist/css/bootstrap.min.css" /vo style vo angular.json
```

Font Awsome

```
npm install font-awesome --save
```

```
"node_modules/font-awesome/css/font-awesome.css" ///vo style vo angular.json
```

```
npm install -g @angular/cli
```

npm is the package manager for the Node JavaScript platform. It puts modules in place so that node can find them, and manages dependency conflicts intelligently. It is extremely configurable to support a wide variety of **use** cases. Most commonly, it is **used** to publish, discover, install, and develop node programs

```
ng v //check angular cli version angular node
```

Create a workspace and initial application

```
ng new my-app
```

The Angular CLI includes a server, so that you can build and serve your app locally.

```
cd my-app ng serve --open
```

```
ng g c componentName
```

```
ng g c componentName -it -is //for inline template it and inline style is
```

Bindings are worth understanding because their expressions are re-evaluated when the data they depend on changes

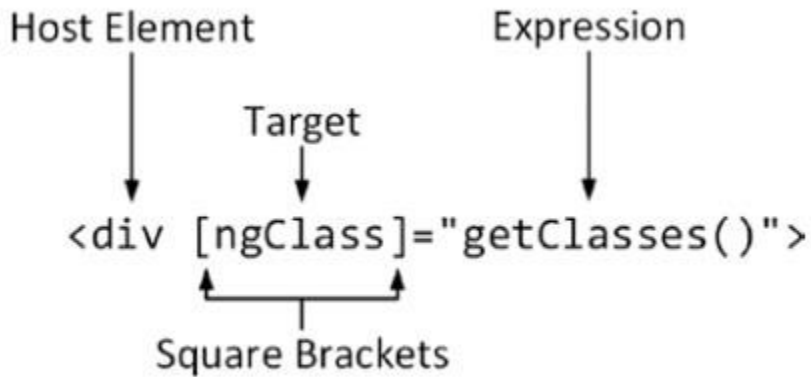


Figure 12-3. *The anatomy of a data binding*

A data binding has these four parts:

- The *host element* is the HTML element that the binding will affect, by changing its appearance, content, or behavior.
- The *square brackets* tell Angular that this is a one-way data binding. When Angular sees square brackets in a data binding, it will evaluate the expression and pass the result to the binding's *target* so that it can modify the host element.
- The *target* specifies what the binding will do. There are two different types of target: a *directive* or a *property binding*.
- The *expression* is a fragment of JavaScript that is evaluated using the template's component to provide context, meaning that the component's property and methods can be included in the expression, like the `getClasses` method in the example binding.

When Angular

sees **square brackets** in a data binding, it will evaluate the expression and pass the result to the binding's target so that it can modify the host element.

If the binding target doesn't correspond to a directive,

Table 12-3. *The Basic Built-in Angular Directives*

Name	Description
ngClass	This directive is used to assign host elements to classes, as described in the “Setting Classes and Styles” section.
ngStyle	This directive is used to set individual styles, as described in the “Setting Classes and Styles” section.
ngIf	This directive is used to insert content in the HTML document when its expression evaluates as true, as described in Chapter 13.
ngFor	This directive inserts the same content into the HTML document for each item in a data source, as described in Chapter 13.
ngSwitchngSwitchCasengSwitchDefault	These directives are used to choose between blocks of content to insert into the HTML document based on the value of the expression, as described in Chapter 13.
ngTemplateOutlet	This directive is used to repeat a block of content, as described in Chapter 13.

then Angular checks to see whether the target can be used to create a property binding.

Table 12-4. *The Angular Property Bindings*

Name	Description
[property]	This is the standard property binding, which is used to set a property on the JavaScript object that represents the host element in the Document Object Model (DOM), as described in the “Using the Standard Property and Attribute Bindings” section.
[attr.name]	This is the attribute binding, which is used to set the value of attributes on the host HTML element for which there are no DOM properties, as described in the “Using the Attribute Binding” section.
[class.name]	This is the special class property binding, which is used to configure class membership of the host element, as described in the “Using the Class Bindings” section.
[style.name]	This is the special style property binding, which is used to configure style settings of the host element, as described in the “Using the Style Bindings” section.

The **target** specifies what the binding will do. There are two different types of target: a directive or a property binding.

The expression has access to the properties and methods defined by the component

Expressions are not restricted to calling methods or reading properties from the component; they can

also perform most standard JavaScript operations

The expression is enclosed in double quotes, which means that the string literal has to be defined using single quotes

The square brackets (the [and] characters) tell Angular that this is a one-way data binding that has an

expression that should be evaluated

if you omit the brackets and the

target is a directive, the expression won't be evaluated, and the content between the quote characters

will be passed to the directive as a literal value

Table 12-5. *The Angular Brackets*

Name	Description
[target]="expr"	The square brackets indicate a one-way data binding where data flows from the expression to the target. The different forms of this type of binding are the topic of this chapter.
{{expression}}	This is the string interpolation binding, which is described in the “Using the String Interpolation Binding” section.
(target) ="expr"	The round brackets indicate a one-way binding where the data flows from the target to the destination specified by the expression. This is the binding used to handle events, as described in Chapter 14.
[(target)] ="expr"	This combination of brackets—known as the <i>banana-in-a-box</i> —indicates a two-way binding, where data flows in both directions between the target and the destination specified by the expression, as described in Chapter 14.

Class Binding

Table 12-6. *The Angular Class Bindings*

Example	Description
<div [class]="expr"></div>	This binding evaluates the expression and uses the result to replace any existing class memberships.
<div [class.myClass]="expr"></div>	This binding evaluates the expression and uses the result to set the element’s membership of myClass.
<div [ngClass]="map"></div>	This binding sets class membership of multiple classes using the data in a map object.

class.myClass

[class.bg-success]="model.getProduct(2).price < 50"

The special class binding will add the host element to the specified class if the result of the expression is truthy

UNDERSTANDING TRUTHY AND FALSY

JavaScript has an odd feature, where the result of an expression can be truthy or falsy, providing a pitfall for the unwary. The following results are always falsy:

- The `false` (boolean) value
- The `0` (number) value
- The empty string (`""`)
- `null`
- `undefined`
- `NaN` (a special number value)

All other values are truthy, which can be confusing. For example, `"false"` (a string whose content is the word `false`) is truthy. The best way to avoid confusion is to only use expressions that evaluate to the boolean values `true` and `false`.

`ngClass`

Table 12-7. *The Expression Result Types Supported by the `ngClass` Directive*

Name	Description
String	The host element is added to the classes specified by the string. Multiple classes are separated by spaces.
Array	Each object in the array is the name of a class that the host element will be added to.
Object	Each property on the object is the name of one or more classes, separated by spaces. The host element will be added to the class if the value of the property is truthy.

string

```
<some-element [ngClass]=" 'first second' " >...</some-element>
```

array

```
<some-element [ngClass]="['first', 'second']">...</some-element>
```

object

```
<some-element [ngClass]="{'first': true, 'second': true, 'third': false}">...</some-element>
```

combination

```
<some-element [ngClass]="stringExp|arrayExp|objExp">...</some-element>
```

object

```
<some-element [ngClass]="{'class1 class2 class3' : true}">...</some-element>
```

Object

```
getClassMap(key: number): Object {  
  let product = this.model.getProduct(key);  
  return {  
    "text-center bg-danger": product.name == "Kayak",  
    "bg-info": product.price < 50 }; }  
will evaluate to  
{  
  "text-center bg-danger":true,  
  "bg-info":false  
}  
or  
[ngClass]="{'bg-success': model.getProduct(3).price < 50,  
'bg-info': model.getProduct(3).price >= 50}"
```

String

```
[ngClass]="getClasses()"
```

```
getClasses(): string {  
  return this.model.getProducts().length == 5 ? "bg-success" : "bg-warning";  
}
```

Style Binding

Table 12-8. *The Angular Style Bindings*

Example	Description
<code><div [style.myStyle]="expr"></div></code>	This is the standard property binding, which is used to set a single style property to the result of the expression.
<code><div [style.myStyle.units]="expr"></div></code>	This is the special style binding, which allows the units for the style value to be specified as part of the target.
<code><div [ngStyle]="map"></div></code>	This binding sets multiple style properties using the data in a map object.

Do not try to use the standard property binding to target the style property to set multiple style values

if you want to set multiple style properties, then create a binding for each of them or use the ngStyle directive.

```
[style.fontSize]="fontSizeWithUnits"
```

You can specify style properties using the Javascript property name format ([style.fontSize]) or using the Css property name format ([style.font-size]).

The **ngStyle** directive allows multiple style properties to be set using a map object, similar to the way that the ngClass directive works

```
getStyles(key: number) {  
  let product = this.model.getProduct(key);  
  return {  
    fontSize: "30px",  
    "margin.px": 100,  
    color: product.price > 50 ? "red" : "green"  
  };  
}
```

Validation

the Angular validation features work only when there is a form element present, and Angular will report an error if you add the ngControl directive to an element that is not contained in a form. the novalidate attribute to the form element, which tells the browser not to use its native validation features, which are inconsistently implemented by different browsers and generally get in the way. Since Angular will be providing the validation, the browser's own implementation of these features is not required

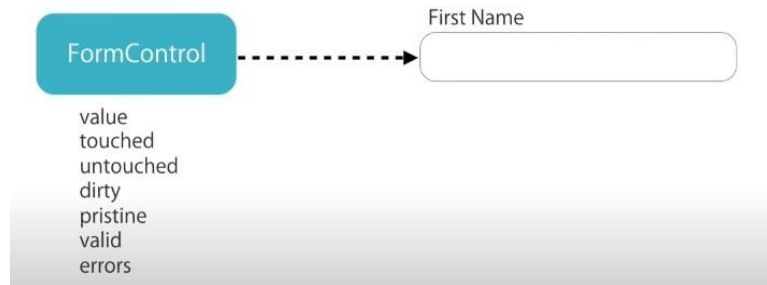
the build in validation attribute show only colors

Table 14-4. *The Built-in Angular Validation Attributes*

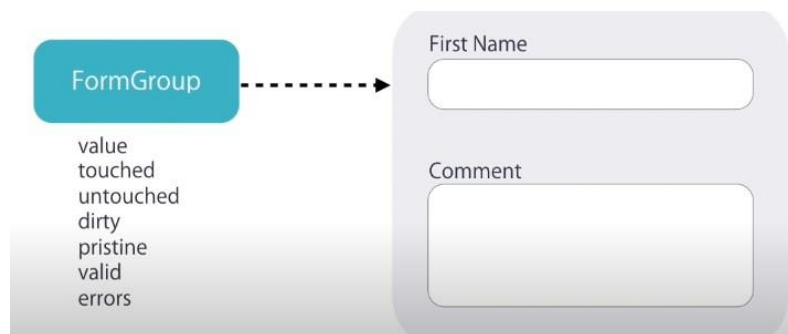
Attribute	Description
required	This attribute is used to specify a value that must be provided.
minlength	This attribute is used to specify a minimum number of characters.
maxlength	This attribute is used to specify a maximum number of characters. This type of validation cannot be applied directly to form elements because it conflicts with the HTML5 attribute of the same name. It can be used with model-based forms, which are described later in the chapter.
pattern	This attribute is used to specify a regular expression that the value provided by the user must match.

if we want text

for each input we create FormControl class



for each form FormGroup object



the FormControl and FormGroup object can be created with template driven or reactive way

Creating Controls



Template Driven

```
ngModel name="firstName"
```

angular creates FormControl obj

```
<div>
<input class="form-control"
name="name"
[(ngModel)]="somename"
ngModel
#name="ngModel"
required
minlength="5"
```

```

pattern="^[A-Za-z ]+$"
(change)="ShowNgModel(name)" if we want to print the FormControl object
/>
<ul class="text-danger list-unstyled" *ngIf="name.dirty && name.invalid">
<li *ngIf="name.errors.required">
You must enter a product name
</li>
</ul>
</div>

```

```

▼ NgModel ⓘ
  ▼ control: FormControl
    asyncValidator: null
    ▼ errors:
      ▶ minlength: {requiredLen
      ▶ __proto__: Object
      pristine: false
      status: "INVALID"
      ▶ statusChanges: EventEmitter
      touched: true
      ▶ validator: f (control)
        value: "Matt"
      ▶ valueChanges: EventEmitter
      ▶ _onChange: [f]
      ▶ _onCollectionChange: () =
      ▶ _onDisabledChange: [f]
      _pendingChange: false
      _pendingDirty: true
      _pendingTouched: true
      _pendingValue: "Matt"
      dirty: true
      disabled: false
      enabled: true
      invalid: true

```

Table 14-6. The Validation Object Properties

Name	Description
path	This property returns the name of the element.
valid	This property returns true if the element's contents are valid and false otherwise.
invalid	This property returns true if the element's contents are invalid and false otherwise.
pristine	This property returns true if the element's contents have not been changed.
dirty	This property returns true if the element's contents have been changed.
touched	This property returns true if the user has visited the element.
untouched	This property returns true if the user has not visited the element.
errors	This property returns an object whose properties correspond to each attribute for which there is a validation error.
value	This property returns the value of the element, which is used when defining custom validation rules, as described in the "Creating Custom Form Validators" section.

Table 14-7. The Angular Form Validation Error Description Properties

Name	Description
required	This property returns true if the required attribute has been applied to the input element. This is not especially useful because this can be deduced from the fact that the required property exists.
minlength. requiredLength	This property returns the number of characters required to satisfy the minlength attribute.
minlength.actualLength	This property returns the number of characters entered by the user.
pattern.requiredPattern	This property returns the regular expression that has been specified using the pattern attribute.
pattern.actualValue	This property returns the contents of the element.

```
import { NgForm } from "@angular/forms";
```

```
<form novalidate #form="ngForm" (ngSubmit)="submitForm(form)">  
angular create FormGroup obj
```

```
submitForm(form: NgForm) {  
  this.formSubmitted = true;  
  if (form.valid) {  
    this.addProduct(this.newProduct);  
    this.newProduct = new Product();  
    form.reset();  
    this.formSubmitted = false;  
  }  
}
```

NgForm provides the reset method, which resets the validation status of the form and returns it to its original and pristine state.

Reactive or Model-Based Forms

```
import {, ReactiveFormsModule } from "@angular/forms";  
import { FormControl, FormGroup, Validators } from "@angular/forms";
```

1. create FormControl

```
nekojFormControl:FormControl=new FormControl("value of the input field",Validators.required)
```

2.Add it to inoput element

```
<input class="form-control" name="name" [formControl]="nekojFormControl" />  
  
{{nekojFormControl.value}} this is the FormControl object
```

you can create custom class instead of `FormControl` that extend `FormControl`
you can create custom class instead of `FormGroup` that extend `FormGroup`

1.create formGroup obj

```
nekojaFormGroup:FormGroup=new FormGroup({  
  
  nekojFormControl:new FormControl("sssdAAAAAAAAAAAAaasx",Validators.required)  
  
});
```

2.Add it to form element

```
<form [formGroup]="nekojaFormGroup">  
  
<input class="form-control" name="name" formControlName="nekojFormControl" />  
  
</form>
```

formControlName must be used with a parent formGroup directive

Example:

```
<div [formGroup]="myGroup">  
  <input formControlName="firstName">  
</div>
```

Nested Form Group

.ts

```
nekojaFormGroup:FormGroup=new FormGroup({  
  
  nekojFormControl:new FormControl("sssdAAAAAAAAAAAAaasx",Validators.required),  
  
  nestedformgroup:new FormGroup({  
  
    nestedFormControl:new FormControl("BBBBBBBBBBBBBBBBBBBB",Validators.required  
  )  
  
  })  
  
});
```

.html

```
<form [formGroup]="nekojaFormGroup">  
  
  <input class="form-control" name="name" formControlName="nekojFormControl" />  
  
  <section formGroupName="nestedformgroup">  
    <input class="form-  
control" name="name" formControlName="nestedFormControl" />  
  </section>  
  
</form>
```

Validating

Angular defines a class called Validators in the @angular/forms module that has properties for each of the built-in validation checks, as described in Table 14-8.

Table 14-8. The Validator Properties

Name	Description
Validators.required	This property corresponds to the required attribute and ensures that a value is entered.
Validators.minLength	This property corresponds to the minlength attribute and ensures a minimum number of characters.
Validators.maxLength	This property corresponds to the maxlength attribute and ensures a maximum number of characters.
Validators.pattern	This property corresponds to the pattern attribute and matches a regular expression.

Validators.compose

The Validators.compose method accepts an array of validators

```
nestedFormControl: new FormControl("BBBBBBBBBBBBBBBBBBB", Validators.compose([Validators.required, Validators.minLength(5)]))
```

Validated

FormControl i FormGroup objects have error property

Custom Validator

1.Create Validator logic

limit.validator.ts

```
import { FormControl } from "@angular/forms";

export class LimitValidator {

  static Limit(limit: number) {

    return (control: FormControl) => {

      let val = Number(control.value);

      if (val != NaN && val > limit) {
        return { "limit": { "limit": limit, "actualValue": val } };
      } else {
```

```
        return null;
    }
}
}
```

} The limit property returns an object that has a limit property that is set to the validation limit and an actualValue property that is set to the value entered by the user

2. adding validator to form control

```
nekojFormControl: new FormControl("sssdAAAAAAAAAAAAaasx", LimitValidator.Limit(10))
```

```
input.ng-dirty.ng-invalid { border: 2px solid #ff0000 }
input.ng-dirty.ng-valid { border: 2px solid #6bc502 }
```

Custom Directive

```
import {PaAttrDirective} from './mydirectiv.directive'
and add it to declarations

in @NgModule
```

```
import { Directive, ElementRef,Attribute,Input } from "@angular/core";

@Directive({
  selector: "[pa]",
})
export class PaAttrDirective {

  constructor(element: ElementRef) {

    element.nativeElement.classList.add("btn-danger");

  }

}
```

```
<button pa >2222222222222222</button>
```

Configure Custom Directive with Attribute

```
import {PaAttrDirective} from './mydirectiv.directive'
and add it to declarations

in @NgModule
```

```
import { Directive, ElementRef,Attribute,Input } from "@angular/core";

@Directive({
  selector: "[pa]",
})
export class PaAttrDirective {

  constructor(element: ElementRef,@Attribute("paattr") bgClass: string) {

    element.nativeElement.classList.add(bgClass || "btn-danger");

  }

}
```

```
}  
}
```

must be both the directive and attribute

```
<button pa paattr="btn-primary" >1111111111111111</button>
```

Configure Custom Directive with Input

```
import {PaAttrDirective} from './mydirectiv.directive'  
and add it to declarations  
in @NgModule
```

```
import { Directive, ElementRef ,Input } from "@angular/core";  
  
@Directive({  
  selector: "[pa]",  
})  
export class PaAttrDirective {  
  
  @Input("pa")  
  bgClass: string;//The input name needs to match the selector to be able to assign this way  
  
  constructor(private element: ElementRef) {  
  
  }  
  ngOnInit() //This method is called after Angular has set the initial value for all the input properties that the directive has declared  
  {  
    this.element.nativeElement.classList.add(this.bgClass || "btn-danger");  
  }  
}
```

[pa] expect expression

```
<button [pa]='btn-primary' >1111111111111111</button>
```

Structural Directive

```
import {PaStructureDirective} from './myStructDirective.sdDirective'
```

and add it to declarations

```
in @NgModule
```

```
import { Directive, SimpleChange, ViewContainerRef, TemplateRef, Input } from "@angular/core";

@Directive({
  selector: "[paIf]"
})
export class PaStructureDirective {

  constructor(private container: ViewContainerRef,
    private template: TemplateRef<Object>) { }

  @Input("paIf")
  expressionResult: boolean;

  ngOnChanges(changes: { [property: string]: SimpleChange }) {
    let change = changes["expressionResult"];
    if (!change.isFirstChange() && !change.currentValue) {
      this.container.clear();
    } else if (change.currentValue) {
      this.container.createEmbeddedView(this.template);
    }
  }
}
```

use the directive


```
<div *paIf="false">Pa if applied on this div</div>
```

Component interaction

```
export class TestComponent implements OnInit {

  @Input('parentData') public name;
  @Output() public childEvent = new EventEmitter();

  constructor() { }

  ngOnInit() {
  }
  fireEvent(){
     this.childEvent.emit('Hey Codevolution');
  }
}

<app-test (childEvent)="message=$event" [parentData]="name"></app-test>
```


Services

all the components in the application that have declared a dependency on DiscountService have received the same object.

each component obtaining the share objects it needs through the dependency injection feature, rather than relying on its parent component to provide it.