Forms

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Forms

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Forms are Crucial

- The most **crucial** aspect of your web application
- Handling user input with forms is the **cornerstone** of many common applications.
- Applications use forms
  - to enable users to log in,
  - to update a profile,
  - to enter sensitive information, and
  - to perform many other data-entry tasks.
- Angular provides two different approaches to handling user input through forms:
  - **Template-driven**
  - **Reactive**

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Forms are Crucial

- Thankfully, **Angular** has tools to build forms
  - **Form** foundation **classes** encapsulate the inputs in our forms and give us objects to work with them
  - **Validators** give us the ability to validate inputs, any way we'd like
  - **Observers** let us watch our form for changes and respond accordingly

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Choosing an approach

- **Template-driven** forms and **Reactive** forms process and manage form data differently.
- Each approach offers different **advantages**.
- **Template-driven** forms
  - Rely on directives in the template to create and manipulate the underlying object model.
  - They are useful for adding a simple form to an app, such as an email list signup form.
  - They're straightforward to add to an app, but they don't scale as well as reactive forms.
  - If you have very basic form requirements and logic that can be managed solely in the template, template-driven forms could be a good fit.

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Choosing an approach

- **Template-driven** forms and **Reactive** forms process and manage form data differently.
- Each approach offers different advantages.
- **Reactive** forms
  - Provide direct, explicit access to the underlying form's object model.
  - Compared to template-driven forms, they are more robust: they're more scalable, reusable, and testable.
  - If forms are a key part of your application, or you're already using reactive patterns for building your application, use reactive forms.

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Key Differences

- The table summarizes the **key differences** between template-driven and reactive forms.

Key Difference		
Factors	**Template-Driven**	**Reactive**
Setup of form model	Implicit, created by directive	Explicit, created in component class
Data model	Unstructured and mutable	Structured and immutable
Data flow	Asynchronous	Synchronous
Form validation	Directives	Functions

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Common Form foundation classes

- Both template-driven and reactive forms are built on the following **base classes**

Foundation Classes	
Class	**Details**
FormControl	Tracks the value and validation status of an individual form control
FormGroup	Tracks the same values and status for a collection of form controls
FormArray	Tracks the same values and status for an array of form controls
ControlValueAccessor	Creates a bridge between Angular FormControl instances and built-in DOM elements

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Setup - Template-driven Forms

- In template-driven forms, the form model is **implicit**, rather than explicit.
- The directive **NgModel** creates and manages a **FormControl** instance for a given form element.
- The following component implements the same input field for a single control, using template-driven forms.

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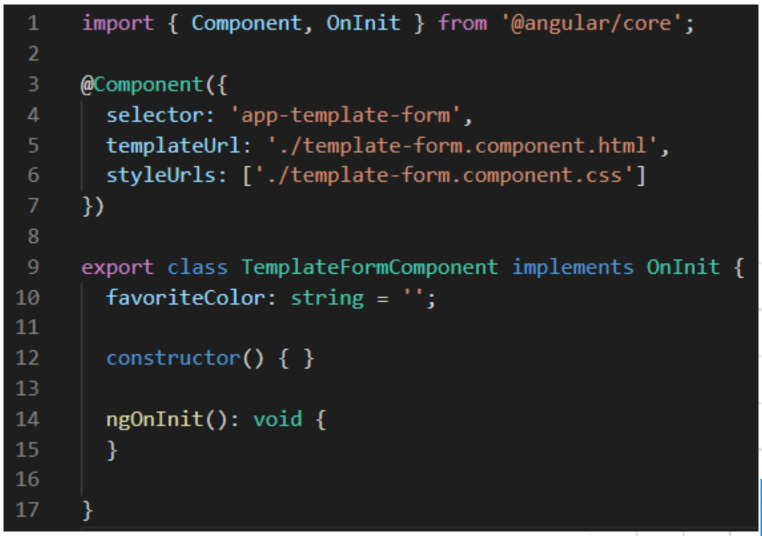
Template-driven Form Component



```
import { Component, OnInit } from '@angular/core';

@Component({
  selector: 'app-template-form',
  templateUrl: './template-form.component.html',
  styleUrls: ['./template-form.component.css']
})

export class TemplateFormComponent implements OnInit {
  favoriteColor: string = '';

  constructor() { }

  ngOnInit(): void {
  }

}
```

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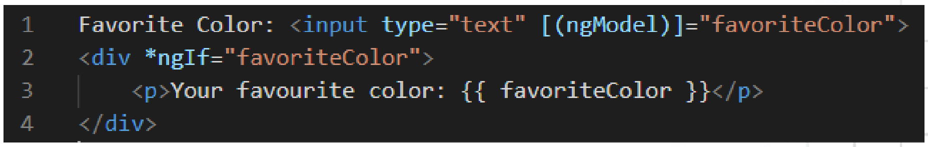
Setup - Template-driven Forms

- In a template-driven form the source of truth is the template.
- You do not have direct programmatic access to the FormControl instance



```
Favorite Color: <input type="text" [(ngModel)]="favoriteColor">
<div *ngIf="favoriteColor">
    <p>Your favourite color: {{ favoriteColor }}</p>
</div>
```

- Observe the use of **NgModel** directive.

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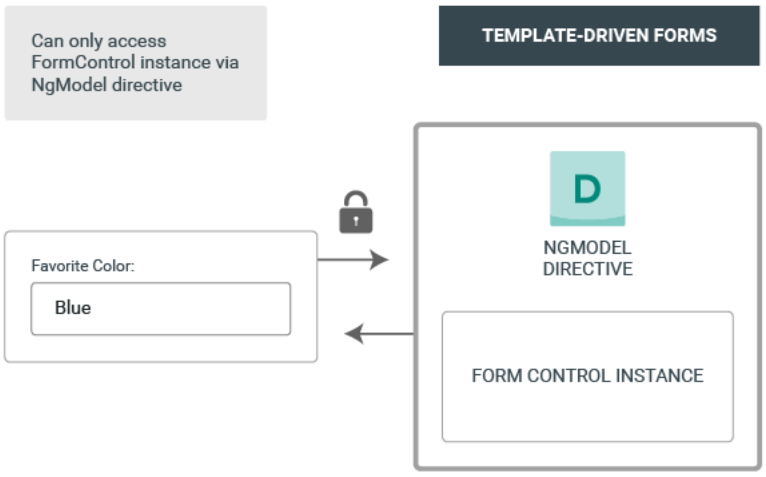
Template-Driven Form



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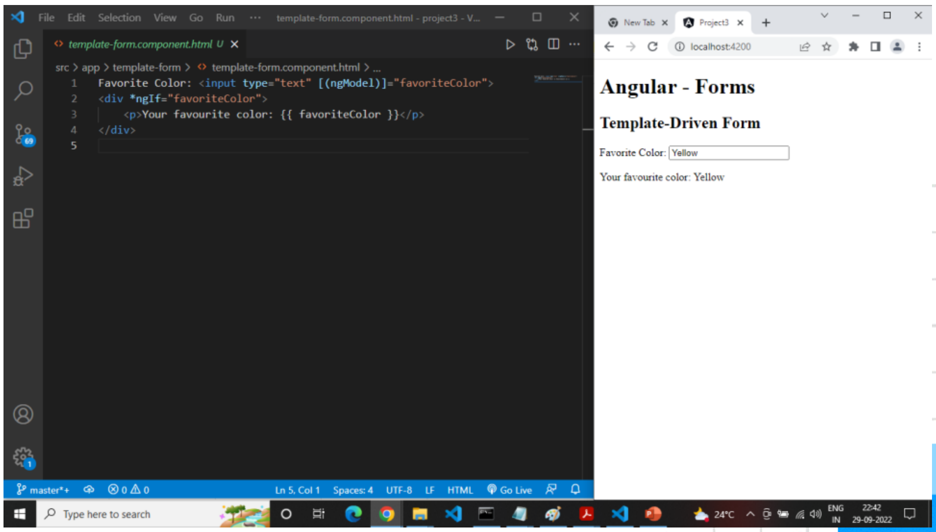

```
Favorite Color: <input type="text" [(ngModel)]="favoriteColor">
<div *ngIf="favoriteColor">
    <p>Your favourite color: {{ favoriteColor }}</p>
</div>
```

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Template-Driven Form

Favorite Color: Yellow

Your favourite color: Yellow

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Setup - Reactive Forms

- With **reactive** forms, you define the form model directly in the component class.
- The **[formControl]** directive links the **explicitly** created **FormControl** instance to a specific form element in the view, using an internal value accessor.
- The following component implements an input field for a single control, using reactive forms.
- In this example, the form model is the **FormControl** instance.

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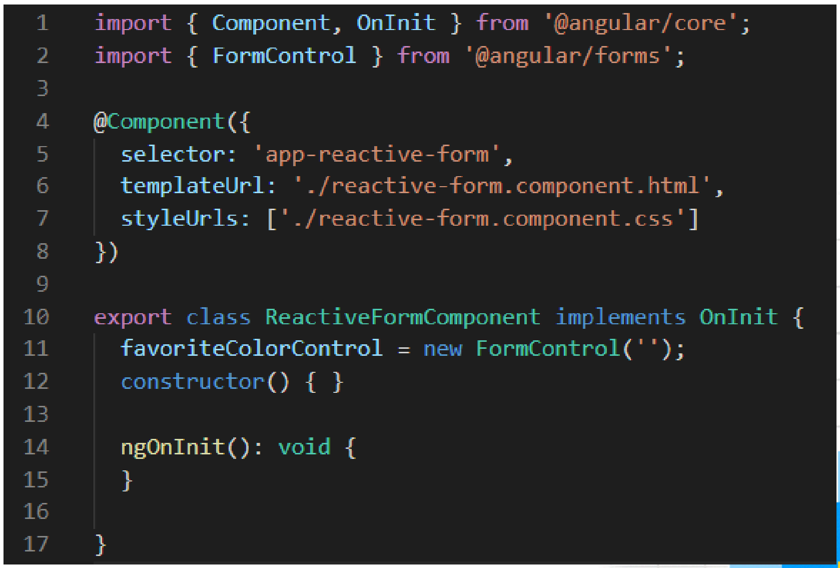
Reactive Form Component



```
import { Component, OnInit } from '@angular/core';
import { FormControl } from '@angular/forms';

@Component({
  selector: 'app-reactive-form',
  templateUrl: './reactive-form.component.html',
  styleUrls: ['./reactive-form.component.css']
})

export class ReactiveFormComponent implements OnInit {
  favoriteColorControl = new FormControl('');
  constructor() { }

  ngOnInit(): void {
  }

}
```

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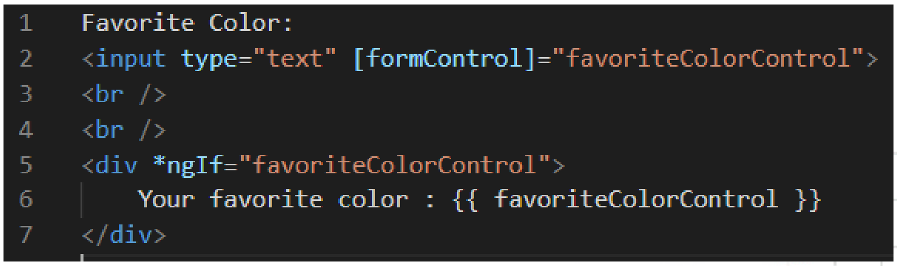
Reactive Form Template



```
Favorite Color:
<input type="text" [formControl]="favoriteColorControl">
<br />
<br />
<div *ngIf="favoriteColorControl">
    Your favorite color : {{ favoriteColorControl }}
</div>
```

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Setup - Reactive Forms

- In reactive forms, the form model is the source of truth.
- It provides the value and status of the form element at any given point in time, through the **[formControl]** directive on the input element.

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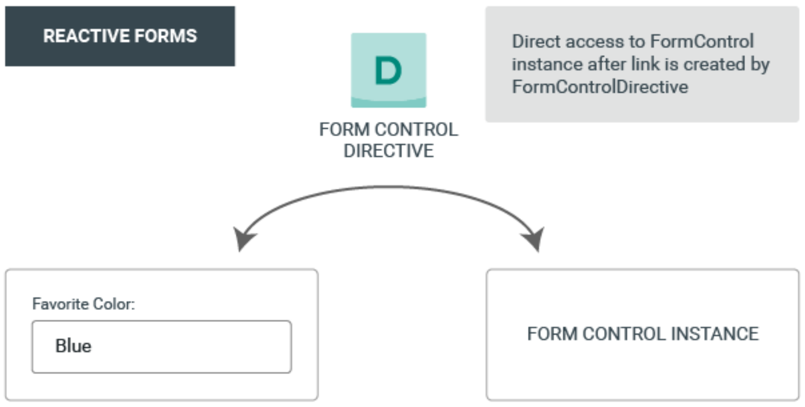
Setup - Reactive forms


REACTIVE FORMS
D
FORM CONTROL DIRECTIVE
Direct access to FormControl instance after link is created by FormControlDirective
Favorite Color:
Blue
FORM CONTROL INSTANCE

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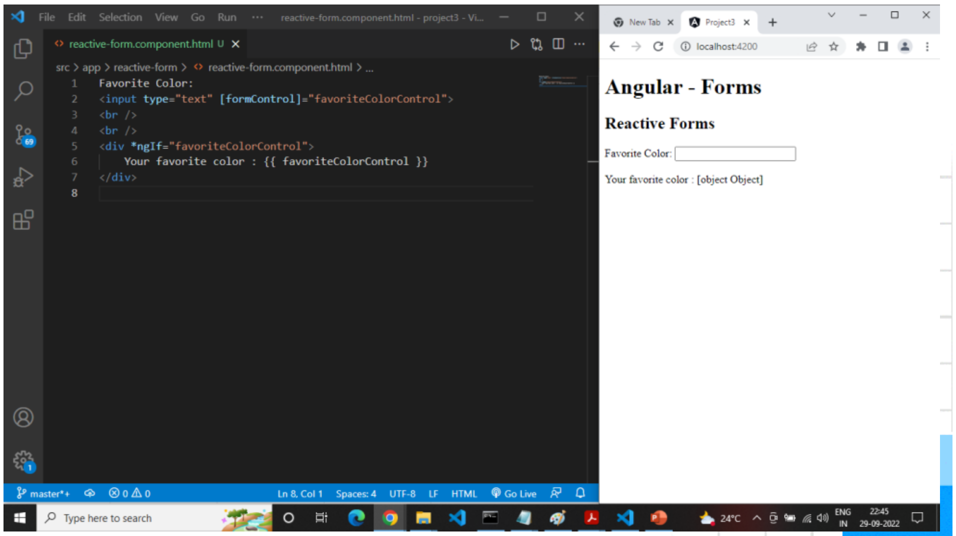

reactive-form.component.html

```
Favorite Color:
<input type="text" [formControl]="favoriteColorControl">
<br />
<br />
<div *ngIf="favoriteColorControl">
    Your favorite color : {{ favoriteColorControl }}
</div>
```

localhost:4200

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Reactive Forms

Favorite Color:

Your favorite color : [object Object]

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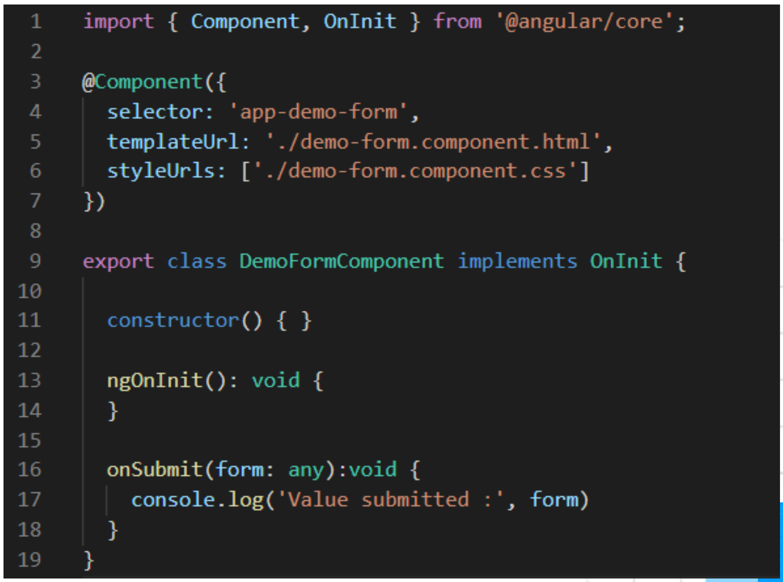
The onSubmit Event



```
import { Component, OnInit } from '@angular/core';

@Component({
  selector: 'app-demo-form',
  templateUrl: './demo-form.component.html',
  styleUrls: ['./demo-form.component.css']
})

export class DemoFormComponent implements OnInit {

  constructor() { }

  ngOnInit(): void {
  }

  onSubmit(form: any):void {
    console.log('Value submitted :', form)
  }
}
```

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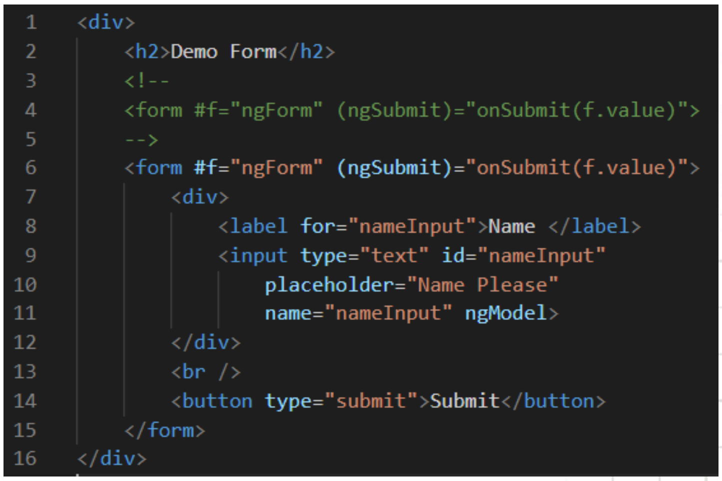
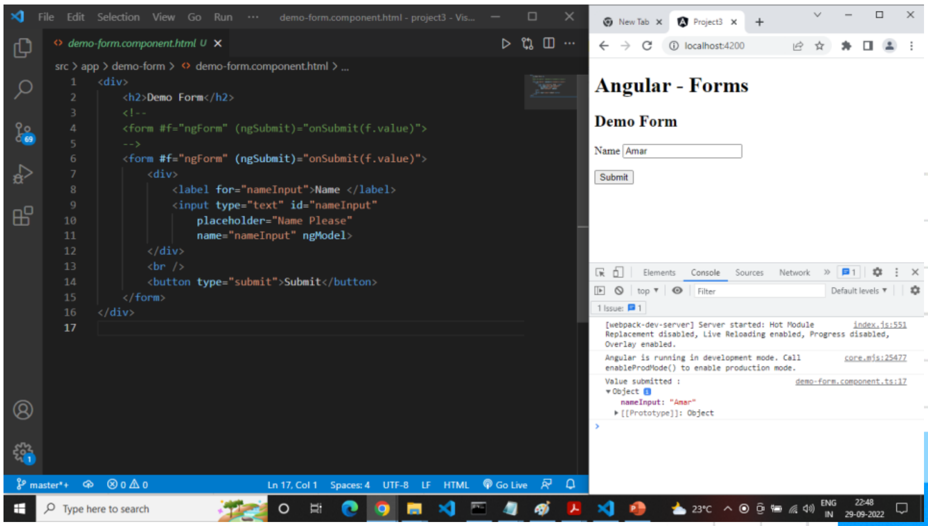
The onSubmit Event

- Template uses the **ngSubmit** directive



```html
<div>
    <h2>Demo Form</h2>
    <!--
    <form #f="ngForm" (ngSubmit)="onSubmit(f.value)">
    -->
    <form #f="ngForm" (ngSubmit)="onSubmit(f.value)">
        <div>
            <label for="nameInput">Name </label>
            <input type="text" id="nameInput"
                placeholder="Name Please"
                name="nameInput" ngModel>
        </div>
        <br />
        <button type="submit">Submit</button>
    </form>
</div>
```



```html
<div>
    <h2>Demo Form</h2>
    <!--
    <form #f="ngForm" (ngSubmit)="onSubmit(f.value)">
    -->
    <form #f="ngForm" (ngSubmit)="onSubmit(f.value)">
        <div>
            <label for="nameInput">Name </label>
            <input type="text" id="nameInput"
                placeholder="Name Please"
                name="nameInput" ngModel>
        </div>
        <br />
        <button type="submit">Submit</button>
    </form>
</div>
```

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Demo Form

Name: Amar

Submit

```
[webpack-dev-server] Server started: Hot Module          index.js:551
Replacement disabled, Live Reloading enabled, Progress disabled,
Overlay enabled.
Angular is running in development mode. Call          core.mjs:25477
enableProdMode() to enable production mode.
Value submitted :                          demo-form.component.ts:17
▼Object
    nameInput: "Amar"
  ▶[[Prototype]]: Object
```

Form Validation

- **Validation** is an integral part of managing any set of forms.
- Whether you're checking for required fields or querying an external API for an existing username etc.
- Angular provides a set of built-in validators as well as the ability to create custom validators.

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Form Validation

- Angular provides a set of built-in validators as well as the ability to create custom validators.

Form Validation	
Form	**Details**
Template-driven forms	Tied to template directives, and must provide custom validator directives that wrap validation functions
Reactive forms	Define custom validators as functions that receive a control to validate

- For more information, see

  https://angular.io/guide/form-validation

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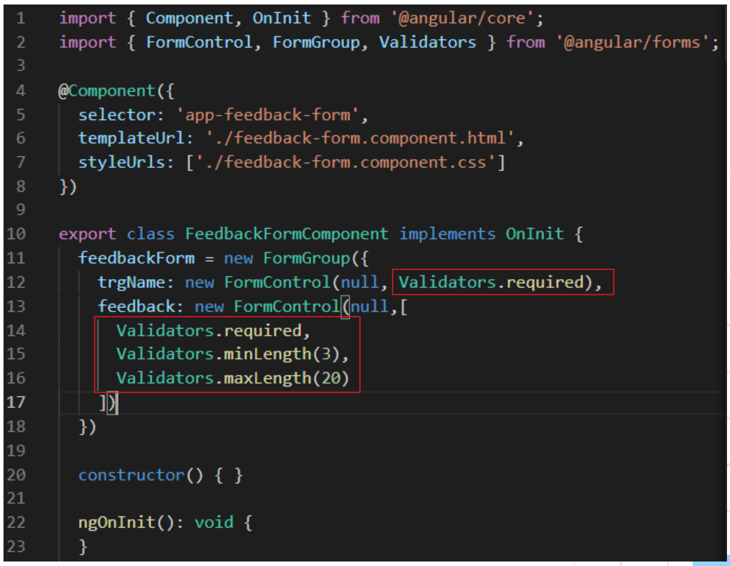
Feedback Form - Validators



```
import { Component, OnInit } from '@angular/core';
import { FormControl, FormGroup, Validators } from '@angular/forms';

@Component({
  selector: 'app-feedback-form',
  templateUrl: './feedback-form.component.html',
  styleUrls: ['./feedback-form.component.css']
})

export class FeedbackFormComponent implements OnInit {
  feedbackForm = new FormGroup({
    trgName: new FormControl(null, Validators.required),
    feedback: new FormControl(null,[
      Validators.required,
      Validators.minLength(3),
      Validators.maxLength(20)
    ])
  })

  constructor() { }

  ngOnInit(): void {
  }
```

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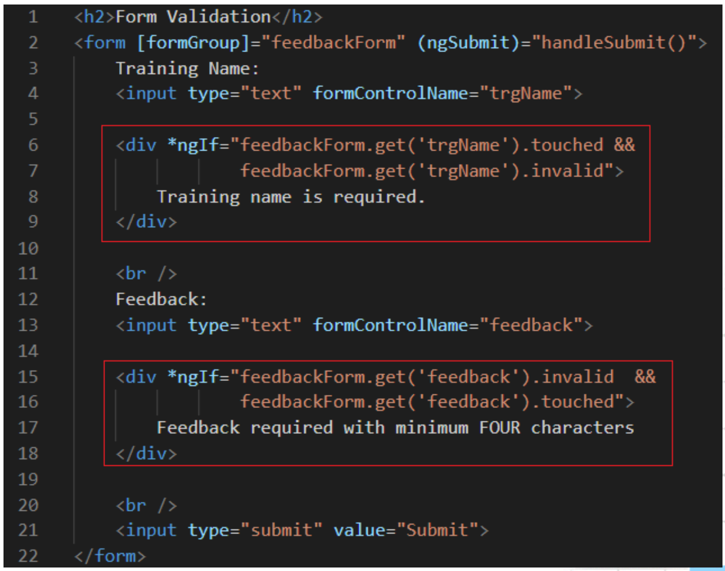
Feedback Form - Validators



```
<h2>Form Validation</h2>
<form [formGroup]="feedbackForm" (ngSubmit)="handleSubmit()">
    Training Name:
    <input type="text" formControlName="trgName">

    <div *ngIf="feedbackForm.get('trgName').touched &&
            feedbackForm.get('trgName').invalid">
        Training name is required.
    </div>

    <br />
    Feedback:
    <input type="text" formControlName="feedback">

    <div *ngIf="feedbackForm.get('feedback').invalid  &&
            feedbackForm.get('feedback').touched">
        Feedback required with minimum FOUR characters
    </div>

    <br />
    <input type="submit" value="Submit">
</form>
```

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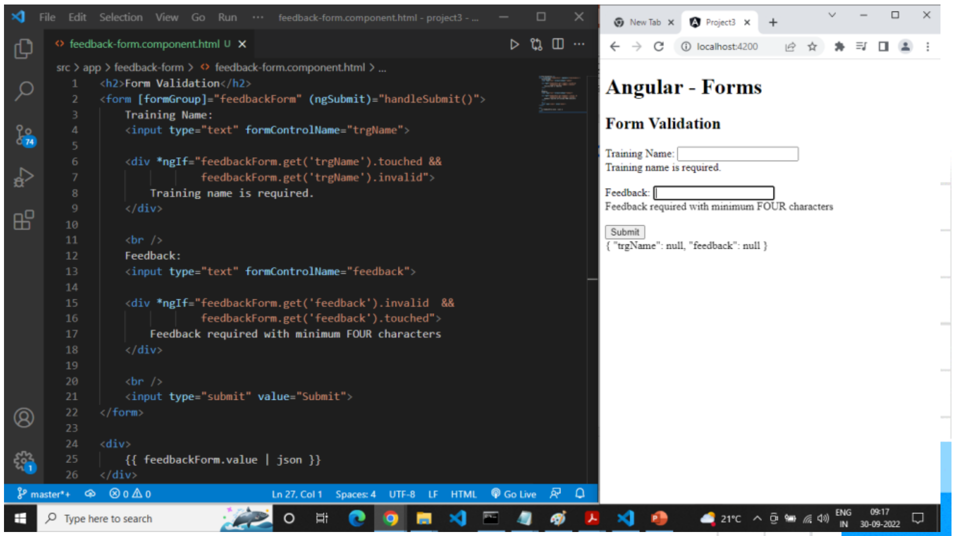
Feedback Form - Validators



feedback-form.component.html

src > app > feedback-form > feedback-form.component.html > ...

```html
<h2>Form Validation</h2>
<form [formGroup]="feedbackForm" (ngSubmit)="handleSubmit()">
    Training Name:
    <input type="text" formControlName="trgName">

    <div *ngIf="feedbackForm.get('trgName').touched &&
                feedbackForm.get('trgName').invalid">
        Training name is required.
    </div>

    <br />
    Feedback:
    <input type="text" formControlName="feedback">

    <div *ngIf="feedbackForm.get('feedback').invalid  &&
                feedbackForm.get('feedback').touched">
        Feedback required with minimum FOUR characters
    </div>

    <br />
    <input type="submit" value="Submit">
</form>

<div>
    {{ feedbackForm.value | json }}
</div>
```

localhost:4200

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Form Validation

Training Name:
Training name is required.

Feedback:
Feedback required with minimum FOUR characters

Submit

```
{ "trgName": null, "feedback": null }
```

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Q&A

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