# Angular Forms With Validation

.NET

*Reactive forms provide a model-driven approach to handling form inputs whose values change over time.*

HTTPS://ANGULAR.IO/GUIDE/REACTIVE-FORMS

# Angular Forms - Overview

https://angular.io/start/start-forms#forms-in-angular
https://angular.io/api/forms/FormBuilder
https://angular.io/guide/forms-overview

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Angular provides two different form types: ***reactive*** and ***template-driven***. Both capture user input ***events*** from the view (template), validate the user input, create a ***form model*** and data model to update, and provide a way to track changes.

- Reactive forms are more robust: they're more scalable, reusable, and testable. If forms are a key part of your application, use ***Reactive Forms***.
- Template-driven forms are useful for adding a simple form to an app but 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, use ***Template-Driven Forms***.

***Reactive*** and ***Template-Driven Forms*** both use a ***form model*** to track value changes between Angular forms and form input elements.
The example shows how one of the four ***form model*** types, ***FormControl***, is defined and created.

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

@Component({
  selector: 'app-reactive-favorite-color',
  template: `
    Favorite Color: <input type="text" [formControl]="favoriteColorControl">
  `
})
export class FavoriteColorComponent {
  favoriteColorControl = new FormControl('');
}
```

# Form Model Classes

https://angular.io/guide/forms-overview#testing

***Reactive*** and ***template-driven*** forms differ in how form-control instances are created and managed.

Both form types are built using these four base classes:

| Class Name | Details |
|---|---|
| FormControl | tracks the value and validation status of an individual form control. |
| FormGroup | tracks the values and status for a collection of form controls. |
| FormArray | tracks the values and status for an array of form controls. |
| ControlValueAccessor | creates a bridge between Angular FormControl instances and native DOM elements. |

# Reactive (Model-Driven) Forms

https://angular.io/start/start-forms#forms-in-angular
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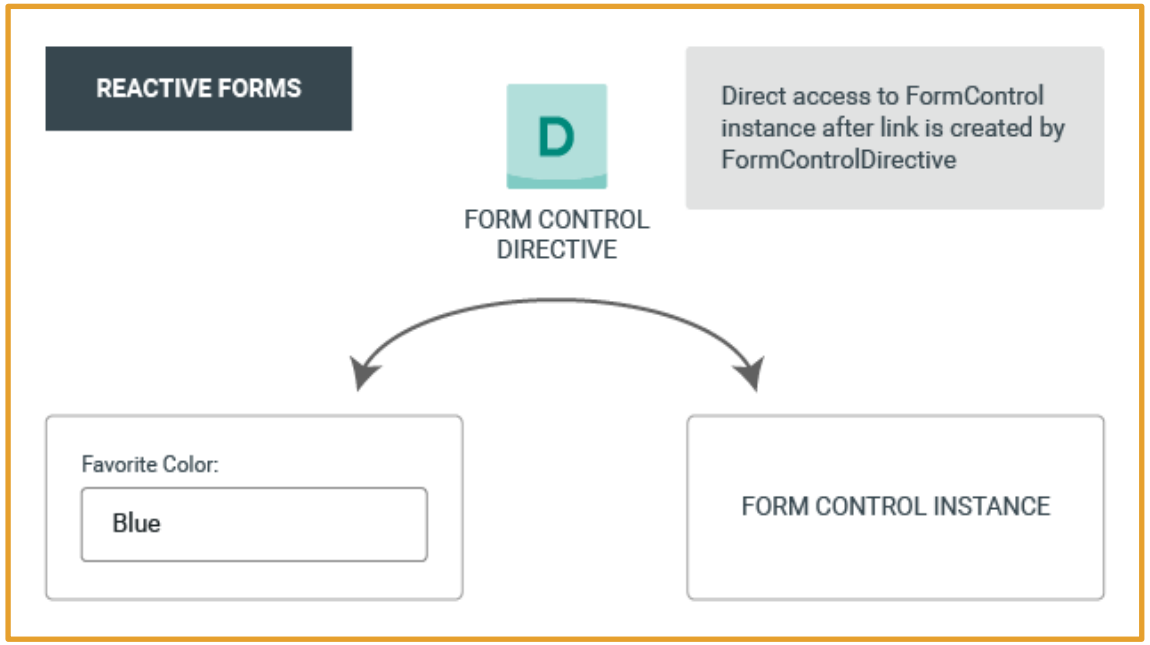
Reactive forms are built around observable streams, where form inputs and values are provided as streams of input values. Reactive forms provide a model-driven approach to handling form inputs whose values change over time.

There are two parts to an ***Angular Reactive form***:

- The objects in ***Component*** to store and manage the form.
- The visualization of the form in the HTML ***template***.

The ***ReactiveFormsModule*** provides the ***FormBuilder*** service.

The ***form model*** is the "source of truth" and provides the value and status of the form element at a given point in time.



# Reactive Form Setup (1/2)

https://angular.io/guide/reactive-forms#adding-a-basic-form-control
https://codecraft.tv/courses/angular/forms/model-driven/

1. Import ***ReactiveFormsModule*** to ***app.module.ts***. Also add it to imports[] in NgModule():
   - import { ReactiveFormsModule } from '@angular/forms';
2. Generate the new component that will have the form:
   - ng generate component [ComponentName].
3. Import ***FormControl*** and ***FormGroup*** into the new component:
   - import { FormControl, FormGroup } from '@angular/forms';.
4. Create an instance of ***FormGroup*** in your component class to represent the form itself.
5. Create ***FormControl*** properties matching the <input> elements of the form in the .html template.

```
import { ReactiveFormsModule } from '@angular/forms';


@NgModule({
  imports: [
    // other imports ...
    ReactiveFormsModule
  ],
})
export class AppModule { }
```

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


@Component({
  selector: 'app-profile-editor',
  templateUrl: './profile-editor.component.html',
  styleUrls: ['./profile-editor.component.css']
})
export class ProfileEditorComponent {
  profileForm = new FormGroup({
    firstName: new FormControl(''),
    lastName: new FormControl(''),
  });
}
```

# Reactive Form Setup (2/2)

https://angular.io/guide/reactive-forms#adding-a-basic-form-control
https://codecraft.tv/courses/angular/forms/model-driven/

7. In the HTML template, add the ***FormControl*** to the <form> with:
   - [formGroup] =“<formGroupName>”
8. Add the ***formControlName*** to each <input> of the form with:
   - [formControlName]=“<inputName>“
9. Add an action to complete when the form is submitted.
10. Add the submit button to the bottom of the form.
11. Add form validation as needed.

Now, whatever input you place in the input field will be transferred to the ***FormGroup’s FormControls*** on the component.

```
<form [formGroup]="profileForm">

  <label for="first-name">First Name: </label>
  <input id="first-name" type="text" formControlName="firstName">

  <label for="last-name">Last Name: </label>
  <input id="last-name" type="text" formControlName="lastName">

</form>
```

```
<form [formGroup]="profileForm" (ngSubmit)="onSubmit()">
```

```
<p>Complete the form to enable button.</p>
<button type="submit" [disabled]="!profileForm.valid">Submit</button>
```

# Reactive Forms – Changing Values

https://angular.io/guide/reactive-forms#replacing-a-form-control-value

There are two ways to update the model value:

- Use the setValue() method to set a new value for an individual control. The setValue() method strictly adheres to the structure of the form group and replaces the entire value for the control.
- Use the patchValue() method to replace any properties defined in the object that have changed in the form model.

..

```
updateProfile() {
  this.profileForm.patchValue({
    firstName: 'Nancy',
    address: {
      street: '123 Drew Street'
    }
  });
}
```

# Reactive Form Validation

https://angular.io/guide/forms-overview#form-validation
https://angular.io/guide/reactive-forms#validating-form-input
https://angular.io/guide/form-validation#validating-input-in-reactive-forms

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Form validation is used to ensure that user input is complete and correct. Reactive Forms include a set of validator functions for common use cases. These functions receive a control to validate against and return an error object or a null value based on the validation check.

In a reactive form, you add validator functions directly to the ***form control model*** in the component class. Angular then calls these functions whenever the value of the control changes.

When giving user inputted values to ***FormControl*** properties, use the .setValue() function to set them. This function will validate the value against your preset ***FormControl*** validations.

```
import { Validators } from '@angular/forms';
```

```
ngOnInit(): void {
  this.heroForm = new FormGroup({
    name: new FormControl(this.hero.name, [
      Validators.required,
      Validators.minLength(4),
      forbiddenNameValidator(/bob/i) // <-- Here's how you pass in the
custom validator.
    ]),
    alterEgo: new FormControl(this.hero.alterEgo),
    power: new FormControl(this.hero.power, Validators.required)
  });

}
```

# Reactive Form Validation

https://angular.io/guide/forms-overview#form-validation
https://angular.io/guide/form-validation
https://angular.io/guide/reactive-forms#validating-form-input

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Validator functions can be either synchronous or asynchronous.

- Sync validators: Synchronous functions that take a control instance and immediately return either a set of validation errors or null. Pass these in as the second argument when you instantiate a *FormControl*.
- Async validators: Asynchronous functions that take a control instance and return an Observable that later emits a set of validation errors or null. You can pass these in as the third argument when you instantiate a *FormControl*.
- Angular only runs async validators if all sync validators pass.

```
this.heroForm = new FormGroup({
  name: new FormControl(this.hero.name, [
    Validators.required,
    Validators.minLength(4),
    forbiddenNameValidator(/bob/i) // <-- Here's how you pass in the custom validator.
  ]),
  alterEgo: new FormControl(this.hero.alterEgo),
  power: new FormControl(this.hero.power, Validators.required)
});
```

# Reactive Form Validation

https://angular.io/api/forms/Validators
https://angular.io/guide/reactive-forms#validating-form-input

| Validator | Description |
|---|---|
| Min(min:number) | requires the control's value to be greater than or equal to the provided number. [Validators.min(3)] |
| Max(max:number) | requires the control's value to be less than or equal to the provided number. [Validators.max(15)] |
| Required() | requires the control have a non-empty value. [Validators.required] |
| requiredTrue() | requires the control's value be true. This validator is commonly used for required checkboxes. [Validators.requiredTrue] |
| Email() | Requires the control's value pass an email validation test. Tests the value using a regular expression pattern for common use cases.<br>Use Validators.pattern() to validate the value against a different pattern.<br>[Validators.email] |

# Reactive Form Validation

https://angular.io/api/forms/Validators
https://angular.io/guide/reactive-forms#validating-form-input

| Validator | Description |
| --- | --- |
| minLength() | Requires the length of the control's value to be greater than or equal to the provided minimum length. Use only for types with a numeric length property. [Validators.Minlength(3)] |
| maxLength() | Requires the length of the control's value to be less than or equal to the provided maximum length. Use only for types with a numeric length property. [Validators.Maxlength(15)] |
| Pattern() | Requires the control's value to match a regex pattern. [Validators.Pattern('[a-za-z]*')] |

# Reactive Form Validation

https://angular.io/guide/form-validation#control-status-css-classes
https://docs.angularjs.org/api/ng/directive/ngModel

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Angular maintains the state of control properties in the form control element as CSS ***classes***. Use these classes to style form control elements according to the state of the form.

| State syntax | Meaning |
|---|---|
| .ng-valid | The value in the field is within range. |
| .ng-invalid | The value in the field is not within range. |
| .ng-pending | $asyncValidator(s) are unfulfilled |
| .ng-pristine | The form has not yet been modified by the user. |
| .ng-dirty | If the user changes the value in the field. |
| .ng-untouched | The field before any user interaction |
| .ng-touched | When the user blurs the form control element. |
| .ng-submitted | Only valid for the form. The form has been submitted. |

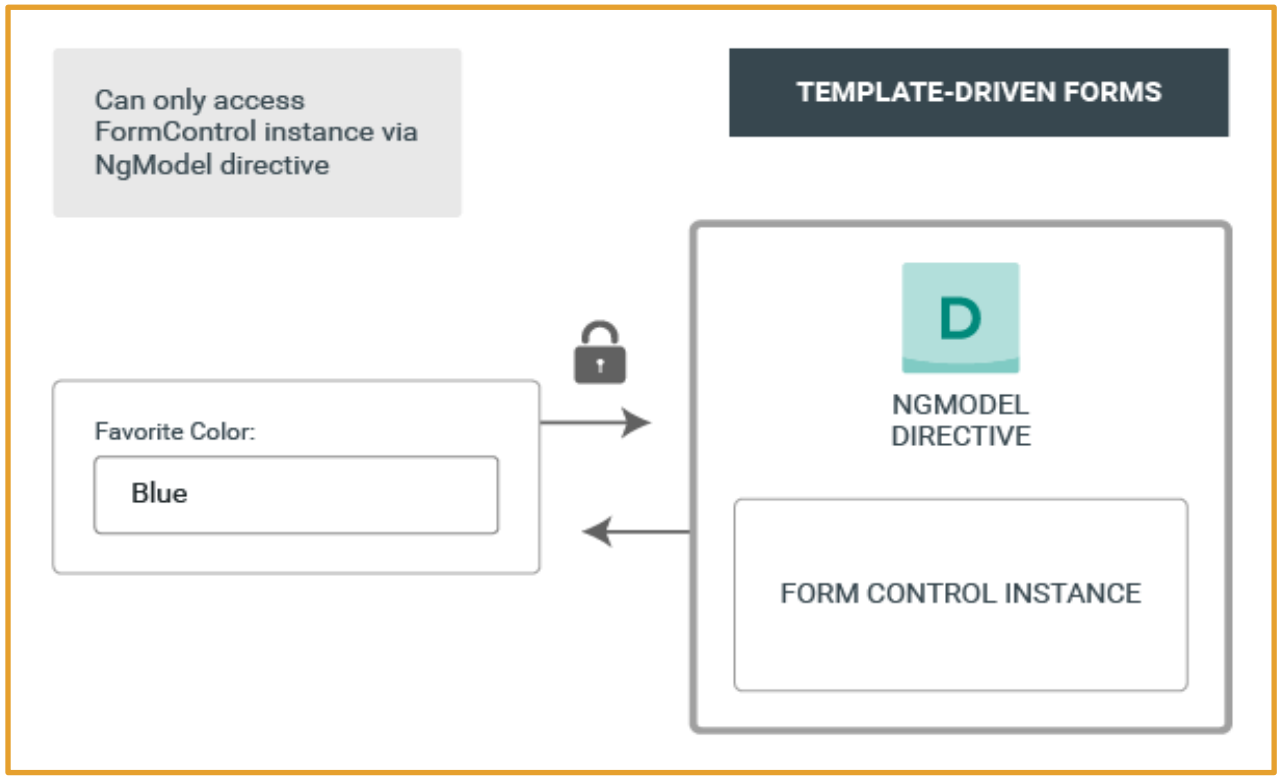
# Template Driven Forms

https://angular.io/start/start-forms#forms-in-angular
https://angular.io/api/forms/FormBuilder
https://angular.io/guide/forms-overview

You can build almost any form with an Angular template.

You can lay out the controls creatively, bind them to data, specify validation rules, and display validation errors.

Angular makes the process easy by handling many of the repetitive, boilerplate tasks you'd otherwise code yourself.



# Template Driven Forms

https://angular.io/start/start-forms#forms-in-angular
https://angular.io/api/forms/FormBuilder
https://angular.io/guide/forms-overview

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

@Component({
  selector: 'app-template-favorite-color',
  template: `
    Favorite Color: <input type="text" [(ngModel)]="favoriteColor">
  `
})
export class FavoriteColorComponent {
  favoriteColor = '';
}
```

```
<input type="text" id="name" class="form-control"
      formC        Name="name" required>

<div *ngI                && (name.dirty || name.touched)"
    class="al                ">

  <div *ngIf="name.e
    Name is required.
  </div>
  <div *ngIf="name.errors?.minle
    Name must be at least 4 characte
  </div>
  <div *ngIf="name.errors?.forbiddenName">
    Name cannot be Bob.
  </div>
</div>
```

Place a getter in the .ts class to use the 'name' variable

# Template-Driven Forms Validation

https://angular.io/guide/form-validation#validating-input-in-template-driven-forms

#name="ngModel" exports the elements status to the local scope where the  elements below can use Structural Directives to change their display status.

To prevent the validator from displaying errors before the user has a chance to edit the form, you should first check for either the dirty or touched states in a control.

```
<input type="text" id="name" name="name" class="form-control"
      required minlength="4" appForbiddenName="bob"
      [(ngModel)]="hero.name" #name="ngModel">
<div *ngIf="name.invalid && (name.dirty || name.touched)"
  class="alert">
  <div *ngIf="name.errors?.required">
    Name is required.
  </div>
  <div *ngIf="name.errors?.minlength">
    Name must be at least 4 characters long.
  </div>
  <div *ngIf="name.errors?.forbiddenName">
    Name cannot be Bob.
  </div>
</div>
```

# Template Driven Forms Setup (1/2)

https://angular.io/guide/forms#introduction-to-template-driven-forms

1. Make sure ***NgModule*** has been imported into app.module.ts:
   - import { NgModule } from '@angular/core';
2. Create a new class with all the fields that this form will help populate:
   - ng generate class <className>.
3. Create a new component with:
   - ng generate component <componentName>
4. import the Class (from step 2).
5. Create an instance of the class in the component.

```
ng generate class Hero
```

```
export class Player {
  constructor(Name: string, Wins: number = 0,
              Losses: number = 0, Id?: number) { }
}
```

```
ng generate component HeroForm
```

```
import { Player } from './../Player';
```

```
model = new Player('null');
```

# Template Driven Forms Setup (2/2)

https://angular.io/guide/forms#introduction-to-template-driven-forms

6. Add @ngModel to the forms <input> elements that correspond to the fields in the Component model (step 4) with:
   - [(ngModel)]="<modelName>.<fieldName>"
7. (optional) add the ***component selector*** to a parent view template (.html)
8. (optional) Add a check value below your input element text box to see what you are entering live.
9. (optional) Enter values into the text box to see the model field value change.

```
<app-login-form></app-login-form>
```

```
    <input [(ngModel)]="model.
</div>
the name is {{model.Name}}
```

# Template Reference Variables

https://angular.io/guide/template-reference-variables

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The #myName in an element in the .html file.

```
<input #phone placeholder="phone number" />

<!-- phone refers to the input element; pass
        its `value` to an event handler -->
<button (click)="callPhone(phone.value)">
    Call your muhthah! She misses you!
</button>
```