Angular Routing Tutorial with Example

12 Comments / 11 minutes of reading / March 9, 2023

In this **Angular Routing Tutorial**, we learn how to use **Angular Router** to navigate from one view to another view in Angular. We will learn what Angular Routing is and how it works. We will also look at various components that make up the Angular Router Module. Then we will learn how to set up and configure the routes. Finally, we will create an Angular Routing Example application with four Angular Components and create a menu navigation system using the Angular Router.

You can download the source code from Stackblitz

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What is Angular Routing

Routing allows you to move from one part of the application to another part or one View to another View.

In Angular, Routing is handled by the Angular Router Module.

Angular Router

The Router is a separate module in Angular. It is in its own library package, @angular/router. The Angular Router provides the necessary service providers and directives for navigating through application views.

Using Angular Router you can

- Navigate to a specific view by typing a URL in the address bar

- Pass optional parameters (query parameters) to the View
- Bind the clickable elements to the View and load the view when the user performs application tasks
- Handles back and forward buttons of the browser
- Allows you to load the view dynamically
- Protect the routes from unauthorized users using Route Guards

Components of Angular Router

Router

An **Angular Router** is a service (Angular Router API) that enables navigation from one component to the next component as users perform application tasks like clicking on menus links, and buttons, or clicking on the back/forward button on the browser. We can access the router object and use its methods like `navigate()` or `navigateByUrl()`, to navigate to a route

Route

`Route` tells the Angular Router which view to display when a user clicks a link or pastes a URL into the browser address bar. **Every `Route` consists of a `path` and a component it is mapped to**. The `Router` object parses and builds the final URL using the `Route`

Routes

`Routes` is an array of `Route` objects our application supports

RouterOutlet

The `outerOutlet` is a directive (<router-outlet>) that serves as a placeholder, where the `Router` should display the view

RouterLink

The `RouterLink` is a directive that binds the HTML element to a `Route`. Clicking on the HTML element, which is bound to a `RouterLink`, will result in navigation to the `Route`. The `RouterLink` may contain parameters to be passed to the route's component.

RouterLinkActive

`RouterLinkActive` is a directive for adding or removing classes from an HTML element that is bound to a `RouterLink`. Using this directive, we can toggle CSS classes for active `RouterLinks` based on the current `RouterState`

ActivatedRoute

The `ActivatedRoute` is an object that represents the currently activated `route` associated with the loaded Component.

RouterState

The current state of the router includes a tree of the currently activated routes together with convenience methods for traversing the route tree.

RouteLink Parameters array

The Parameters or arguments to the `Route`. It is an array that you can bind to `RouterLink` directive or pass it as an argument to the `Router.navigate` method.

How to configure Angular Router

To Configure the Router in Angular, you need to follow these steps

- Set the <base href>

- Define routes for the view
- Register the Router Service with Routes
- Map HTML Element actions to Route
- Choose where you want to display the view

Set the <base href>

The HTML <base> element specifies the base URL to use for all relative URLs contained within a document.

The Angular Router uses the HTML5 style of Routing (or PathLocationStrategy) as the default option. The router makes use of the browser's history API for navigation and URL interaction.

```

<base href="/">

```

To make HTML5 routing work, we need to set up the "base href" in the DOM. This is done in the *index.html* file immediately after the head tag.

You can read more about the PathLocationStrategy & HashLocationStrategy

Define the routes

Next, create an array of route objects. Each route maps the path (URL Segment) to the component

```

const appRoutes={ path: 'product', component: ProductComponent }

```

Where

path: The URL path segment of the route. We will use this value to refer to this route elsewhere in the app

component: The component to be loaded.

This route tells angular to render ProductComponent when the user navigates to the URL “/product”

Register the Routes

Import the Angular Router from **@angular/router** library in the root module of the application

```

import { RouterModule } from '@angular/router';

```

Then, install the routes using the `RouterModule.forRoot` method, passing the routes as the argument in the imports array

```

```

```
imports: [RouterModule.forRoot(appRoutes)],

```

Map Action to Routes

Next, we need to bind the click event of the link, image, or button to a route. This is done using the routerlink directive

```

<li><a [routerLink]="['product']">Product</a></li>

```

The routerLink directive accepts an array of route names along with parameters. This array is called a **Link Parameters array**.

When the application requests navigation to the route "product", the router looks in the routes array and activates the instance of the component associated with the route **"product"**, which is ProductComponent. The browser address location & history is also updated to /product

Choose where you want to display

Finally, we need to tell the angular where to display the view. This is done using the RouterOutlet directive as shown. We will add the following directive to the root component.

```

<router-outlet></router-outlet>

```

Angular Router: Sample Application

Let's build a sample application with four components and build a navigation system to route each one of them

HomeComponent: This component will display the Welcome message. This is also our default component.

home.component.ts

```

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

@Component({
    template: `<h1>Welcome!</h1>
              <p>This is Home Component </p>
             `
})

export class HomeComponent {
}

```

ContactComponent: Displays the contact message.

contact.component.ts

```

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

@Component({
     template: `<h1>Contact Us</h1>
                <p>TekTutorialsHub </p>
                `
})
export class ContactComponent {
}

```

ProductComponent: Displays the list of products. The Products are retrieved from the Angular 2 Service using Dependency injection.

product.component.ts

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

import { ProductService } from './product.service';
import { Product } from './product';

@Component({
  templateUrl: './product.component.html',
})

export class ProductComponent
{

   products:Product[];

   constructor(private productService:ProductService){
   }

   ngOnInit() {
     this.products=this.productService.getProducts();
   }

}

```

```

<h1>Product List</h1>
<div class='table-responsive'>
    <table class='table'>
        <thead>
            <tr>
                <th>ID</th>
                <th>Name</th>
            <th>Price</th>
         </tr>
      </thead>
      <tbody>
         <tr *ngFor="let product of products;">
            <td>{{product.productID}}</td>
            <td><a [routerLink]="['detail',product.productID]">{{product.name}} </a> <
            <td>{{product.price}}</td>
         </tr>
      </tbody>
   </table>
</div>

<router-outlet></router-outlet>

```

ErrorComponent: The `ErrorComponent` is displayed, when the user navigates to a nonexistent path. This is basically a 404 error page.

error.component.ts

```

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

@Component({
   template: `<h1>Page not found</h1>
            <p>This is a Error Page</p>
           `
})

export class ErrorComponent {
}

```

Product Service

product.service.ts

```

import { Observable } from 'rxjs/Observable';
import {Product} from './Product'


```

```
export class ProductService{

    public getProducts() {

        let products:Product[];

        products=[
            new Product(1,'Memory Card',500),
            new Product(2,'Pen Drive',750),
            new Product(3,'Power Bank',100)
        ]

        return products;
    }


    public getProduct(id) {
        let products:Product[]=this.getProducts();
        return products.find(p => p.productID==id);
    }


}

```

product.ts

```

export class Product {

    constructor(productID:number,    name: string ,   price:number) {
        this.productID=productID;
        this.name=name;
        this.price=price;
    }

    productID:number ;
    name: string ;
    price:number;

}

```

Index.html

index.html

```
<!doctype html>
<html>
<head>
  <base href="/">
  <meta charset="utf-8">
  <title>Angular 2 Routing</title>


  <meta name="viewport" content="width=device-width, initial-scale=1">
  <link rel="icon" type="image/x-icon" href="favicon.ico">
  <link href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css" rel
   ...
</head>
<body>
  <app-root>Loading...</app-root>
</body>
</html>

```

Note the **<base href="/">** right after the head tag. This makes the browser know where is the root of our application is and helps it to construct the URL's

Routes

Now, we have our components ready. The next step is to create our routes.

It is good practice to create all our route configurations in a separate file. So create **app.routes.ts** under the app folder.

app.routes.ts

```

import { Routes } from '@angular/router';

import { HomeComponent} from './home.component'
import { ContactComponent} from './contact.component'
import { ProductComponent} from './product.component'
import { ErrorComponent} from './error.component'

export const appRoutes: Routes = [
  { path: 'home', component: HomeComponent },
  { path: 'contact', component: ContactComponent },
  { path: 'product', component: ProductComponent },
  { path: '', redirectTo: 'home', pathMatch: 'full' },
  { path: '**', component: ErrorComponent }
];

```

First, we import Routes from the router module

Next, we need to import all the components, that require routing We have imported Home, Contact, Product, and Error Components

Finally, we have defined a constant (appRoutes) that contains the **Routes** that we wish to create. The **Routes** is an array of **route configuration objects** (or route objects).

Each route has several configurable properties.

Our First route is

```

{ path: 'home', component: HomeComponent },

```

The first parameter is the path, which represents the URL path segment. The second parameter is the component to display. The above route configuration means, when you navigate to /home (URL path segment), then the HomeComponent gets displayed.

Note that the path does not contain the leading slash

The next two routes are similar to the home route

```

{ path: 'contact', component: ContactComponent },
{ path: 'product', component: ProductComponent },

```

Default Route

The fourth route is

```

{ path: '', redirectTo: 'home', pathMatch: 'full' },

```

The path is empty, indicating the default route. The default route is redirected to the home path using the RedirectTo argument. This route means that, when you navigate to the root of your application /, you are redirected to the home path (/home), which in turn displays the `HomeComponent`.

Note, that we have `pathMatch` argument set to 'full'. The pathMatch tells the Router how to match the URL.

When it is set to full, the path is matched to the entire URL

Every route ends in an empty space for ex: /contact/’’. If pathMatch is not set to full then the router will apply the redirect, which results in the error.

Wild Card Route

The next route is the wildcard route

```

{ path: '**', component: ErrorComponent }

```

The “**” matches every URL. The Router will display the ErrorComponent.

Order matters: First one wins

Note that the order of the route is important. The Routes are matched in the order they are defined. The Router always returns the first matching route (first-match-wins strategy)

Since the wildcard route (**) matches every URL and should be placed last.

Now, we have set up our routes. Now we will add these routes to our application.

Register the Routes

Routes are registered in the root module of the application. I.e. app.module.ts

app.module.ts

```

import { BrowserModule } from '@angular/platform-browser';
import { NgModule } from '@angular/core';
import { FormsModule } from '@angular/forms';
import { HttpModule } from '@angular/http';

import { RouterModule } from '@angular/router';

import { AppComponent } from './app.component';
import { HomeComponent} from './home.component'
import { ContactComponent} from './contact.component'
import { ProductComponent} from './product.component'
import { ErrorComponent} from './error.component'

import { ProductService } from './product.service';

import { appRoutes } from './app.routes';

@NgModule({
  declarations: [
    AppComponent,HomeComponent,ContactComponent,ProductComponent,ErrorComponer
  ],
  imports: [
    BrowserModule,
    FormsModule,
    HttpModule,
    RouterModule.forRoot(appRoutes)                         /*path location strategy */
   /*RouterModule.forRoot(appRoutes, { useHash: true }) */   /*Hashlocationstrategy */
  ],
  providers: [ProductService],
  bootstrap: [AppComponent]
})
export class AppModule { }

```

First, we import the RouterModule

```

import { RouterModule } from '@angular/router';

```

Next, import all the components

```

import { AppComponent } from './app.component';
import { HomeComponent} from './home.component'
import { ContactComponent} from './contact.component'
import { ProductComponent} from './product.component'
import { ErrorComponent} from './error.component'

```

Next import the routes, which we configured from app.routes

```

import { routes } from './app.routes';

```

Finally, we add the RouterModule to the import array, passing the routes we have configured via the forRoot method

```

imports: [
    BrowserModule,
    FormsModule,
    HttpModule,
    RouterModule.forRoot(routes)
],

```

Note that we are using the **forRoot method**.

the forRoot method is used, when you want to provide the service and also want to configure the service at the same time

The **routermodule.forroot** method returns the Router Service configured with the routes passed in the argument and also registers the Router service. It also registers the other providers that the routing module requires.

When the application is bootstrapped, the Router service looks at the current browser URL and performs the initial navigation.

When the user changes the URL either by clicking on a link in the page or by entering a URL in the address bar, the router looks for a corresponding Route from the Routes array and renders the associated component.

Defining The Navigation

The next step is to define the navigation

Open the app.component.html. The AppComponent is only handling navigation. It will display the menu option, which the user can click to navigate to a view

app.component.ts

```

<div class="container">

<nav class="navbar navbar-default">
  <div class="container-fluid">
    <div class="navbar-header">
      <a class="navbar-brand" [routerLink]="['/']"><strong> {{title}} </strong></a>
    </div>
    <ul class="nav navbar-nav">
        <li><a [routerLink]="['home']">Home</a></li>
        <li><a [routerLink]="['product']">Product</a></li>
        <li><a [routerLink]="['contact']">Contact us</a></li>
    </ul>
  </div>
</nav>

```

```
 <router-outlet></router-outlet>

</div>

```

We are using bootstrap to style our component

```

<li><a [routerLink]="['home']">Home</a></li>
<li><a [routerLink]="['product']">Product</a></li>
<li><a [routerLink]="['contact']">Contact us</a></li>

```

We use **the routerLink directive** to bind anchor tag elements to the route

RouterLink is an attribute directive. We enclose it in a square bracket. The routerLink is then bound to the template expression, which returns a **link parameters array**.

The **Link Parameters array** is the Parameters or arguments to the Route. The Angular Router module constructs the URL using the link parameters array

When the user clicks on the link, the Router service uses the path to locate the route associated with the path and activates the component

Display the component using Router-outlet

Finally, we need to tell Angular where to display the Component. This is done using the **Router-outlet directive**

The RouterOutlet is a directive that tells Angular where on our page we want to display the view.

We do not have to import the RouterOutlet and RouterLink directives. These directives are imported when we imported RouterModule in our app.module

```

<router-outlet></router-outlet>

```

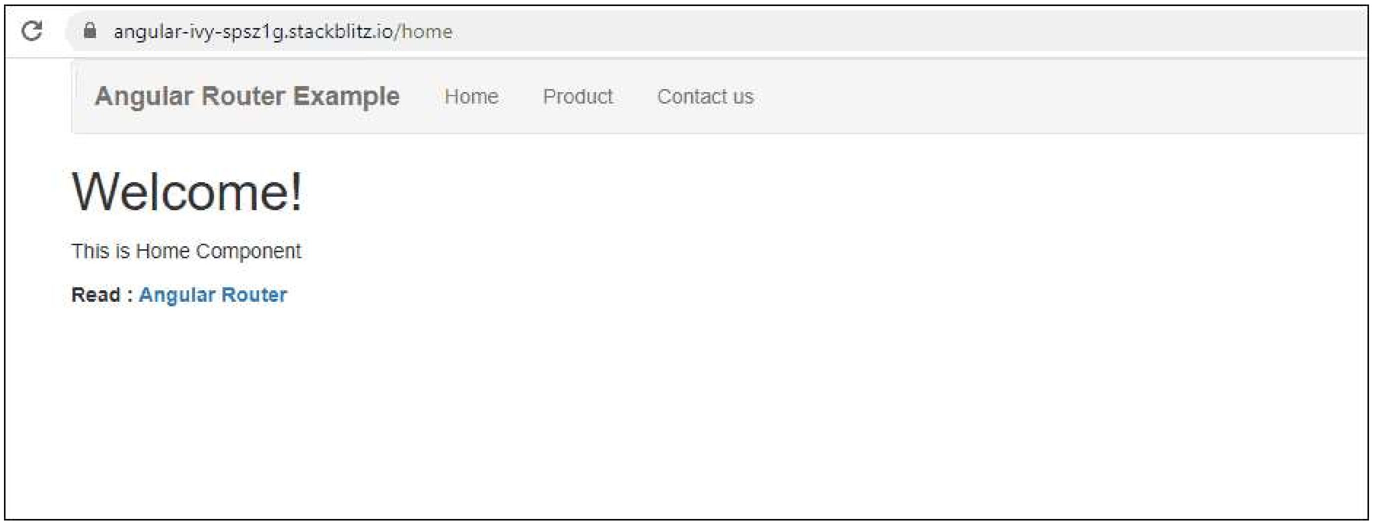
That's it

Running the Application

Type the in the address bar http://localhost:4200, you should see the HomeComponent is rendered, which is the default root

Type the invalid URL and you should see the ErrorComponent rendered.

Click on the menu options or Type the Back & forward button in the browser. Everything should work as intended.



Welcome!

This is Home Component

Read : Angular Router

References

- Angular Guide
- **@angular/router**