Angular 2+

Workshop. HttpClient.

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## Task 01. Import Modules

1. Make changes to **AppModule**. Use the following snippet of code:

// 1

import { HttpClientModule } from '@angular/common/http';

// 2

imports: [

…

HttpClientModule,

AppRoutingModule

]

## Task 02. Simulating Web API

1. Run the following command from command line:

**>npm install -g json-server**

2. Create file **db\db.json (in project folder).** Use the following snippet of code:

{

"tasks": [

{ "id": 1, "action": "Estimate", "priority": 1, "estHours": 8},

{ "id": 2, "action": "Create", "priority": 2, "estHours": 8},

{ "id": 3, "action": "Edit", "priority": 3, "estHours": 4},

{ "id": 4, "action": "Delete", "priority": 3, "estHours": 2},

{ "id": 5, "action": "Build", "priority": 1, "estHours": 4},

{ "id": 6, "action": "Deploy", "priority": 2, "estHours": 8}

],

"users": [

{ "id": 1, "firstName": "Anna", "lastName": "Borisova" },

{ "id": 2, "firstName": "Boris", "lastName": "Vlasov"},

{ "id": 3, "firstName": "Clara", "lastName": "Dmitrieva"},

{ "id": 4, "firstName": "Dariya", "lastName": "Egorova"},

{ "id": 5, "firstName": "Fatima", "lastName": "Georg"},

{ "id": 6, "firstName": "Hunna", "lastName": "Jackson"}

]

}

3. Make changes to **package.json** file.

"start": "concurrently --kill-others \"ng serve -o\" \"json-server --watch db\\db.json\"",

"start": "ng serve",

4. Run project:

**>npm start**

## Task 03. Task Promise Service

1. Create **TaskPromiseService**. Use the following snippet of code:

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

import { HttpClient } from '@angular/common/http';

// rxjs

import { toPromise } from 'rxjs/operator/toPromise';

import { Task } from './../models/task.model';

@Injectable()

export class TaskPromiseService {

private tasksUrl = 'http://localhost:3000/tasks';

constructor(

private http: HttpClient

) {}

getTasks(): Promise<Task[]> {

return this.http.get(this.tasksUrl)

.toPromise()

.then( response => <Task[]>response)

.catch(this.handleError);

}

private handleError(error: any): Promise<any> {

console.error('An error occurred', error);

return Promise.reject(error.message || error);

}

}

1. Create file **tasks/services/index.ts**. Use the following snippet of code:

export \* from './task-array.service';

export \* from './task-promise.service';

1. Make changes to the file **tasks/index.ts.** Use the following snippet of code:

export \* from './services/task-array.service';

1. Make changes to **TasksModule**. Use the following snippet of code:

// 1

import {

TaskListComponent,

TaskComponent,

TaskFormComponent,

TaskArrayService,

TaskPromiseService

} from '.';

// 2

providers: [

TaskArrayService,

TaskPromiseService

]

1. Make changes to **TaskListComponent**. Use the following snippet of code:

// 1

import { TaskArrayService, TaskPromiseService } from './../services/task-promise.service';

// 2

constructor(

…

private taskPromiseService: TaskPromiseService) { }

// 3

private async getTasks() {

this.tasks = await this.taskPromiseService.getTasks();

this.tasks = await this.taskArrayService.getTasks();

}

## Task 04. GetTask

1. Make changes to **TaskPromiseService.** Use the following snippet of code:

getTask(id: number): Promise<Task> {

const url = `${this.tasksUrl}/${id}`;

return this.http

.get(url)

.toPromise()

.then(response => <Task>response)

.catch(this.handleError);

}

1. Make changes to **TaskFormComponent.** Use the following snippet of code:

// 1

import { TaskArrayService, TaskPromiseService } from './../../services/task-array.service';

// 2

constructor(

…

private taskPromiseService: TaskPromiseService

) { }

// 3

this.route.paramMap

.pipe(

switchMap((params: Params) =>

this.taskArrayService.getTask(+params.get('taskID'))))

this.taskPromiseService.getTask(+params.get('taskID'))))

.subscribe(

task => this.task = {...task},

err => console.log(err)

);

## Task 05. UpdateTask

1. Make changes to **TaskPromiseService.** Use the following snippet of code:

// 1

import { HttpClient, HttpHeaders } from '@angular/http';

// 2

updateTask(task: Task): Promise<Task> {

const url = `${this.tasksUrl}/${task.id}`,

body = JSON.stringify(task),

options = {

headers: new HttpHeaders({ 'Content-Type': 'application/json' }),

};

return this.http

.put(url, body, options)

.toPromise()

.then(response => <Task>response)

.catch(this.handleError);

}

1. Make changes to method **saveTask** of **TaskFormComponent.** Use the following snippet of code:

if (task.id) {

this.taskArrayService.updateTask(task);

this.taskPromiseService.updateTask(task)

.then( () => this.goBack() );

}

else {

this.taskArrayService.addTask(task);

this.goBack();

}

this.goBack();

1. Make changes to **TaskListComponent.** Use the following snippet of code:

// 1

import { TaskArrayService, TaskPromiseService } from './../../services';

// 2

constructor(

private router: Router,

private taskArrayService: TaskArrayService,

private taskPromiseService: TaskPromiseService

) { }

// 3

onCompleteTask(task: Task): void {

this.updateTask(task).catch(err => console.log(err));

}

// 4

private async updateTask(task: Task) {

const updatedTask = await this.taskPromiseService.updateTask({

...task,

done: true

});

if (updatedTask) {

const index = this.tasks.findIndex(t => t.id === updatedTask.id);

if (index > -1) {

this.tasks.splice(index, 1, updatedTask);

}

}

}

## Task 06. CreateTask

1. Make changes to **TaskListComponent** **template**. Use the following snippet of HTML:

<div>

<button class="btn btn-primary"

(click)="onCreateTask()">New Task</button>

<br><br>

<app-task

\*ngFor="let task of tasks"

[task]="task"

(completeTask)="onCompleteTask($event)"

(editTask)="onEditTask($event)">

</app-task>

</div>

1. Make changes to **TaskListComponent.** Use the following snippet of code:

// 1

onCreateTask() {

const link = ['/add'];

this.router.navigate(link);

}

1. Make changes to **TasksRoutingModule**. Use the following snippet of code:

const routes: Routes = [

…

{

path: 'add',

component: TaskFormComponent

},

{

path: 'edit/:taskID',

component: TaskFormComponent

}

];

1. Make changes to **TaskPromiseService.** Use the following snippet of code:

createTask(task: Task): Promise<Task> {

const url = this.tasksUrl,

body = JSON.stringify(task),

options = {

headers: new HttpHeaders({ 'Content-Type': 'application/json' })

};

return this.http

.post(url, body, options)

.toPromise()

.then(response => <Task>response)

.catch(this.handleError);

}

1. Make changes to method **ngOnInit** of **TaskFormComponent.** Use the following snippet of code:

switchMap((params: Params) => this.taskPromiseService.getTask(+params.get('taskID')))

switchMap((params: Params) => {

return params.get('taskID')

? this.taskPromiseService.getTask(+params.get('taskID'))

: Promise.resolve(null);

})

1. Make changes to method **saveTask** of **TaskFormComponent.** Use the following snippet of code:

if (task.id) {

this.taskPromiseService.updateTask(task)

.then( () => this.goBack() );

}

else {

this.taskArrayService.addTask(task);

this.goBack();

}

const method = task.id ? 'updateTask' : 'createTask';

this.taskPromiseService[method](task)

.then(() => this.goBack())

.catch(err => console.log(err));

1. Make changes to **TaskFormComponents**. Use the following snippet of code:

// 1

import { TaskArrayService, TaskPromiseService } from './../../services';

// 2

constructor(

private taskArrayService: TaskArrayService,

…

) { }

## Task 07. DeleteTask

1. Make changes to **TaskComponent** **template**. Use the following snippet of HTML:

<div class="panel panel-default">

<div class="panel-heading">Task</div>

<div class="panel-body">

<ul>

<li>Action: {{task.action}}</li>

<li>Priority: {{task.priority}}</li>

<li>Estimate Hours: {{task.estHours}}</li>

<li>Actual Hours: {{task.actHours}}</li>

<li>Done: {{task.done}}</li>

</ul>

<button class="btn btn-primary btn-sm"

(click)="onCompleteTask()"

[disabled]="task.done">

Done

</button>

<button class="btn btn-warning btn-sm"

(click)="onEditTask()">

Edit

</button>

<button class="btn btn-danger btn-sm"

(click)="onDeleteTask()">

Delete

</button>

</div>

</div>

1. Make changes to **TaskComponent.** Use the following snippet of code:

// 1

@Output() deleteTask = new EventEmitter<Task>();

// 2

onDeleteTask() {

this.deleteTask.emit(this.task);

}

1. Make changes to **TaskListComponent** **template.** Use the following snippet of code:

<app-task

\*ngFor="let task of tasks"

[task]="task"

(completeTask)="onCompleteTask($event)"

(editTask)="onEditTask($event)"

(deleteTask)="onDeleteTask($event)">

</app-task>

1. Make changes to **TaskPromiseService.** Use the following snippet of code:

deleteTask(task: Task): Promise<Task> {

const url = `${this.tasksUrl}/${task.id}`;

return (

this.http

.delete(url)

.toPromise()

// json-server return empty object

// so we don't use .then(...)

.catch(this.handleError)

);

}

1. Make changes to **TaskListComponent.** Use the following snippet of code:

onDeleteTask(task: Task) {

this.taskPromiseService.deleteTask(task)

.then(() => (this.tasks = this.tasks.filter(t => t.id !== task.id)))

.catch(err => console.log(err));

}

## Task 08. User Observable Service

1. Create file **users/users.config.ts.** Use the following snippet of code:

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

const usersBaseUrl = 'http://localhost:3000/users';

export const UsersAPI = new InjectionToken<string>('UsersAPI');

export const UsersAPIProvider = {

provide: UsersAPI,

useValue: usersBaseUrl

};

1. Create **UserObservableService.** Use the following snippet of code:

import { Injectable, Inject } from '@angular/core';

import { HttpClient, HttpHeaders, HttpResponse, HttpErrorResponse } from '@angular/common/http';

import { Observable } from 'rxjs/Observable';

import { \_throw } from 'rxjs/observable/throw';

import { map, catchError } from 'rxjs/operators';

import { User } from './../models/user.model';

import { UsersAPI } from './../users.config';

@Injectable()

export class UserObservableService {

constructor(

private http: HttpClient,

@Inject(UsersAPI) private usersUrl: string

) {}

getUsers(): Observable<User[]> {

return this.http.get(this.usersUrl)

.pipe(

map( this.handleData ),

catchError( this.handleError )

);

}

getUser(id: number) {

}

updateUser(user: User) {

}

createUser(user: User) {

}

deleteUser(user: User) {

}

private handleData(response: HttpResponse<User>) {

const body = response;

return body || {};

}

private handleError(err: HttpErrorResponse) {

let errorMessage: string;

// A client-side or network error occurred.

if (err.error instanceof Error) {

errorMessage = `An error occurred: ${err.error.message}`;

}

// The backend returned an unsuccessful response code.

// The response body may contain clues as to what went wrong,

else {

errorMessage = `Backend returned code ${err.status}, body was: ${err.error}`;

}

console.error(errorMessage);

return \_throw(errorMessage);

}

}

1. Create file **users/services/index.ts**. Use the following snippet of code:

export \* from './user-array.service';

export \* from './user-observable.service';

1. Make changes to file **users/index.ts.** Use the following snippet of code:

export \* from './services/user-array.service';

1. Make changes to **UsersModule**. Use the following snippet of code:

// 1

import { UsersAPIProvider } from './users.config';

import { UserComponent, UserArrayService, UserResolveGuard, UserObservableService } from '.';

// 2

providers: [

…

UsersAPIProvider,

UserObservableService

]

1. Make changes to **UserListComponent.** Use the following snippet of code:

// 1

import { UserArrayService, UserObservableService } from './../../services/user-array.service';

// 2

constructor(

…

private userObservableService: UserObservableService

) { }

// 3

ngOnInit() {

this.users$ = this.userObservableService.getUsers();

this.users$ = this.userArrayService.getUsers();

…

}

## Task 09. GetUser

1. Make changes to **UserObservableService.** Use the following snippet of code:

getUser(id: number): Observable<User> {

const url = `${this.usersUrl}/${id}`;

return this.http.get(url)

.pipe(

map(this.handleData),

catchError(this.handleError)

);

}

1. Make changes to **UserResolveGuard.** Use the following snippet of code:

// 1

import { UserArrayService, UserObservableService } from './../services/user-array.service';

// 2

constructor(

private userArrayService: UserArrayService,

private userObservableService: UserObservableService,

…

) {}

// 3

resolve(route: ActivatedRouteSnapshot): Observable<User> {

…

return this.userArrayService.getUser(id)

return this.userObservableService.getUser(id)

…

}

1. Make changes to method **ngOnInit** of **UserListComponent.** Use the following snippet of code:

// 1

import { of } from 'rxjs/observable/of';

// 2 ngOnInit

switchMap((params: Params) => this.userArrayService.getUser(+params.get('editedUserID')))

switchMap((params: Params) => {

return params.get('editedUserID')

? this.userObservableService.getUser(+params.get('editedUserID'))

: of(null);

})

## Task 10. UpdateUser and CreateUser

1. Make changes to the method **updateUser** of **UserObservableService.** Use the following snippet of code:

updateUser(user: User): Observable<User> {

const url = `${this.usersUrl}/${user.id}`,

body = JSON.stringify(user),

options = {

headers: new HttpHeaders({ 'Content-Type': 'application/json' })

};

return this.http

.put(url, body, options)

.pipe(

map( this.handleData ),

catchError(this.handleError)

);

}

1. Make changes to the method **createUser** of **UserObservableService.** Use the following snippet of code:

createUser(user: User): Observable<User> {

const url = this.usersUrl,

body = JSON.stringify(user),

options = {

headers: new HttpHeaders({ 'Content-Type': 'application/json' })

};

return this.http

.post(url, body, options)

.pipe(

map( this.handleData ),

catchError( this.handleError )

);

}

1. Make changes to **UserFormComponent.** Use the following snippet of code:

// 1

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

import { Subscription } from 'rxjs/Subscription';

import { UserArrayService } from './../../services/user-array.service';

import { UserObservableService } from './../../services';

import { Location } from '@angular/common';

// 2

export class UserFormComponent implements OnInit, OnDestroy, CanComponentDeactivate {

// 3

private sub: Subscription;

// 4

constructor(

private userArrayService: UserArrayService,

private userObservableService: UserObservableService,

private location: Location,

…

) { }

// 5

ngOnDestroy(): void {

if (this.sub) {

this.sub.unsubscribe();

}

}

// 6 saveUser method

if (user.id) {

this.userArrayService.updateUser(user);

// optional parameter: http://localhost:4200/users;editedUserID=2

this.router.navigate(['users', {editedUserID: user.id}]);

}

else {

this.userArrayService.addUser(user);

this.goBack();

}

this.originalUser = {...this.user};

const method = user.id ? 'updateUser' : 'createUser';

this.sub = this.userObservableService[method](user)

.subscribe(

() => {

this.originalUser = {...this.user};

user.id

// optional parameter: http://localhost:4200/users;editedUserID=2

? this.router.navigate(['users', { editedUserID: user.id }])

: this.goBack();

},

error => console.log(error)

);

// 7

goBack() {

this.router.navigate(['./../../'], { relativeTo: this.route });

this.location.back();

}

1. Make changes to **UsersComponent** **template.** Use the following snippet of HTML:

<h2>Users</h2>

<button class="btn btn-primary"

(click)="onCreateUser()">New User</button>

<br><br>

<router-outlet></router-outlet>

1. Make changes to **UsersComponent.** Use the following snippet of code:

// 1

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

// 2

constructor(

private router: Router

) { }

// 3

onCreateUser() {

const link = ['/users/add'];

this.router.navigate(link);

}

## Task 11. DeleteUser

1. Make changes to **UserComponent template.** Use the following snippet of HTML:

<button class="btn btn-warning btn-sm"

(click)="onEditUser()">

Edit

</button>

<button class="btn btn-danger btn-sm"

(click)="onDeleteUser()">

Delete

</button>

1. Make changes to **UserComponent.** Use the following snippet of code:

// 1

@Output() deleteUser = new EventEmitter<User>();

// 2

onDeleteUser() {

this.delete.emit(this.user);

}

1. Make changes to **UserListComponent** **template.** Use the following snippet of HTML:

<user

\*ngFor='let user of users'

[user]="user"

[class.edited]="isEdited(user)"

(editUser)="onEditUser($event)"

(deleteUser)="onDeleteUser($event)">

</user>

1. Make changes to **UserObservableService.** Use the following snippet of code:

// 1

import { map, concatMap, catchError } from 'rxjs/operators';

// 2

deleteUser(user: User): Observable<User[]> {

const url = `${this.usersUrl}/${user.id}`;

return this.http.delete(url)

.pipe(

concatMap(() => this.getUsers())

);

}

1. Make changes to **UserListComponent.** Use the following snippet of code:

onDeleteUser(user: User) {

this.users$ = this.userObservableService.deleteUser(user);

}

## Task 12. AutoUnsubscribe Decorator

1. Create file **app/core/decorators/auto-unsubscribe.decorator.ts.** Use the following snippet of code:

export function AutoUnsubscribe(subName: string = 'sub') {

return function (constructor) {

const original = constructor.prototype.ngOnDestroy;

constructor.prototype.ngOnDestroy = function () {

const sub = this[subName];

if (sub) {

sub.unsubscribe();

}

if (original && (typeof original === 'function')) {

original.apply(this, arguments);

}

console.log(`Unsubscribe decorator is called. Subscription name is: ${subName}.`);

};

};

}

1. Create file **app/core/decorators/index.ts.** Use the following snippet of code:

export \* from './auto-unsubscribe.decorator';

1. Make changes to file **app/core/index.ts**. Use the following snippet of code:

export \* from './decorators';

1. Make changes to **UserFormComponent.** Use the following snippet of code:

// 1

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

import { AutoUnsubscribe, DialogService, CanComponentDeactivate } from './../../../core';

// 2

@Component({

templateUrl: './user-form.component.html',

styleUrls: ['./user-form.component.css'],

})

@AutoUnsubscribe()

export class UserFormComponent implements OnInit, OnDestroy, CanComponentDeactivate {

// 3

ngOnDestroy(): void {

if (this.sub) {

this.sub.unsubscribe();

}

}

## Task 13. Request Configuration

1. Make changes to **UserObservableService.** Use the following snippet of code:

// 1

import { HttpClient, HttpHeaders, HttpResponse, HttpErrorResponse, HttpParams } from '@angular/common/http';

//2

// Case 1 Handle Body {observe: 'body'}

// getUser(id: number): Observable<User> {

// return this.http.get(`${this.usersUrl}/${id}`, {observe: 'body'})

// .pipe(

// map(this.handleData1),

// catchError(this.handleError)

// );

// }

// private handleData1(response: User) {

// console.log(response);

// const body = response;

// return body || {};

// }

// End Case 1

// Case 2: Handle Response { observe: 'response' }

// getUser(id: number): Observable<User> {

// return this.http.get(`${this.usersUrl}/${id}`, {observe: 'response'})

// .pipe(

// map(this.handleData2),

// catchError(this.handleError)

// );

// }

// private handleData2(response: HttpResponse<User>) {

// console.log(response);

// const body = response.body;

// return body || {};

// }

// End Case 2

// Case 3: Specify HttpResponse Type get<T>

// getUser(id: number): Observable<User> {

// return this.http.get<User>(`${this.usersUrl}/${id}`)

// .pipe(

// map(this.handleData3),

// catchError(this.handleError)

// );

// }

// private handleData3(response: User) {

// console.log(response);

// const body = response;

// return body || {};

// }

// End Case 3

// Case 4: responseType: text

// getUser(id: number): Observable<User> {

// return this.http.get(`${this.usersUrl}/${id}`, {responseType: 'text'})

// .pipe(

// map(this.handleData4),

// catchError(this.handleError)

// );

// }

// private handleData4(response: string) {

// console.log(response);

// const body = JSON.parse(response);

// return body || {};

// }

// End Case 4

1. Comment the method **getUser()** and uncomment snippet of code for first case, then second, … Look to the console.

## Task 14. Interceptors

1. Create file **app/core/interceptors/my.interceptor.ts**. Use the following snippet of code:

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

import { HttpEvent, HttpInterceptor, HttpHandler, HttpRequest, HttpResponse, HttpParams } from '@angular/common/http';

import { Observable } from 'rxjs/Observable';

@Injectable()

export class MyInterceptor implements HttpInterceptor {

intercept(req: HttpRequest<any>, next: HttpHandler): Observable<HttpEvent<any>> {

// request interceptor

let clonedRequest;

if (req.url.includes('users')) {

clonedRequest = req.clone({

params: new HttpParams()

.set('ts\_interceptor', Date.now().toString())

});

console.log(clonedRequest);

} else {

clonedRequest = req;

}

return next.handle(clonedRequest);

}

}

1. Make changes to **AppModule.** Use the following snippet of code:

import { HttpClientModule, HTTP\_INTERCEPTORS } from '@angular/common/http';

import { MyInterceptor } from './core/interceptors/my.interceptor';

providers: [

…

{

provide: HTTP\_INTERCEPTORS,

useClass: MyInterceptor,

multi: true,

}

]

1. Look at the requests in the browser console. Ensure that only the user requests are processed by My interceptor.
2. Make changes to **MyInterceptor.** Use the following snippet of code:

// 1

import { map } from 'rxjs/operators';

// 2

return next.handle(clonedRequest);

return next.handle(clonedRequest)

.pipe(

// response interceptor

map((event: HttpEvent<any>) => {

if (event instanceof HttpResponse) {

// do stuff with response

console.log('Response Interceptor');

console.log(event);

console.log(event.body);

return event;

}

})

);

1. Look in the console on the result of applying My interceptor.