Module 8: Authentication with JWT and Security

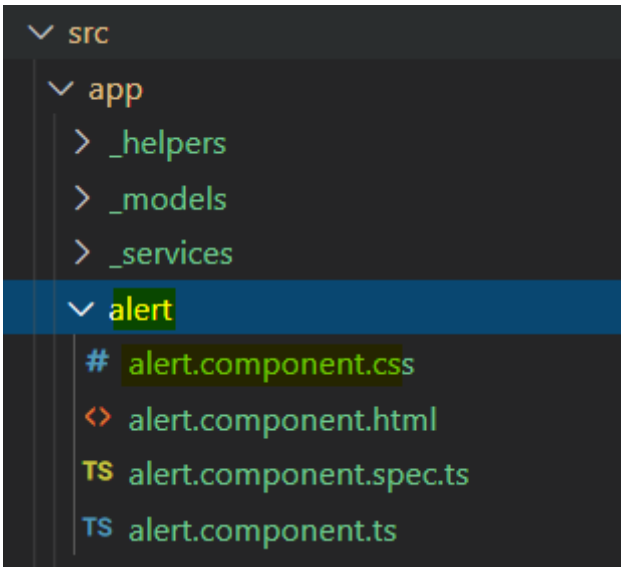
Demo Document 2: Use JWT authentication for login form

Use JWT authentication for login form created in demo1 of module 8

In this demo, we will see how authenticate user using JWT, we have already created login and register components in demo 1 of module 8, we will continue to use same module code to create JWT authentication

Step 1: Open visual studio and open folder Module8Demo1.

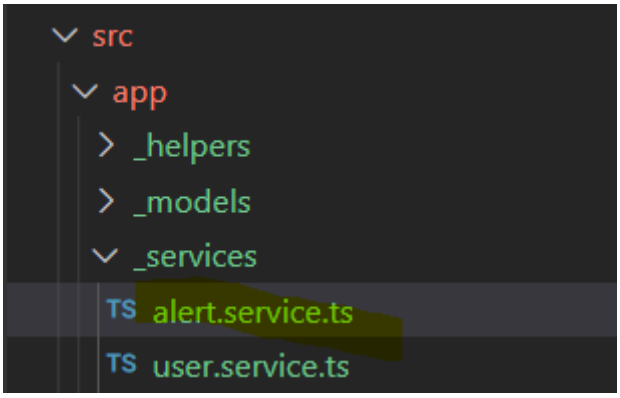
Step 2: Create alert component using command ng g c alert inside src/app folder alert component is just used to display error or success messages.




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

import {AlertService} from '../_services/alert.service'

@Component({
  selector: 'app-alert',
  templateUrl: './alert.component.html',
  styleUrls: ['./alert.component.css']
})
export class AlertComponent implements OnInit,OnDestroy {
  private subscription: Subscription;
  message: any;

  constructor(private alertService:AlertService) { }

  ngOnInit() {
    this.subscription = this.alertService.getAlert()
    .subscribe(message => {
        switch (message && message.type) {
            case 'success':
```

```
                message.cssClass = 'alert alert-success';
                break;
            case 'error':
                message.cssClass = 'alert alert-danger';
                break;
        }

        this.message = message;
    });
  }

  ngOnDestroy() {
    this.subscription.unsubscribe();
}

}
```

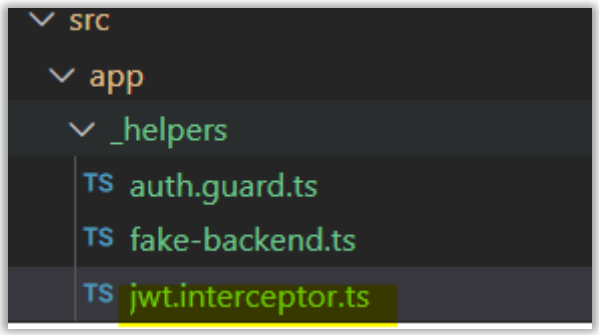
Step 3- Create alert service inside _services folder




```
import { Injectable } from '@angular/core';
import { Router, NavigationStart } from '@angular/router';
import { Observable, Subject } from 'rxjs';

@Injectable({ providedIn: 'root' })
export class AlertService {
    private subject = new Subject<any>();
    private keepAfterRouteChange = false;

    constructor(private router: Router) {
        // clear alert messages on route change unless 'keepAfterRouteChange' flag
 is true
        this.router.events.subscribe(event => {
            if (event instanceof NavigationStart) {
                if (this.keepAfterRouteChange) {
                    // only keep for a single route change
                    this.keepAfterRouteChange = false;
                } else {
```

```
                    // clear alert message
                    this.clear();
                }
            }
        });
    }

    getAlert(): Observable<any> {
        return this.subject.asObservable();
    }

    success(message: string, keepAfterRouteChange = false) {
        this.keepAfterRouteChange = keepAfterRouteChange;
        this.subject.next({ type: 'success', text: message });
    }

    error(message: string, keepAfterRouteChange = false) {
        this.keepAfterRouteChange = keepAfterRouteChange;
        this.subject.next({ type: 'error', text: message });
    }

    clear() {
        // clear by calling subject.next() without parameters
        this.subject.next();
    }
}
```

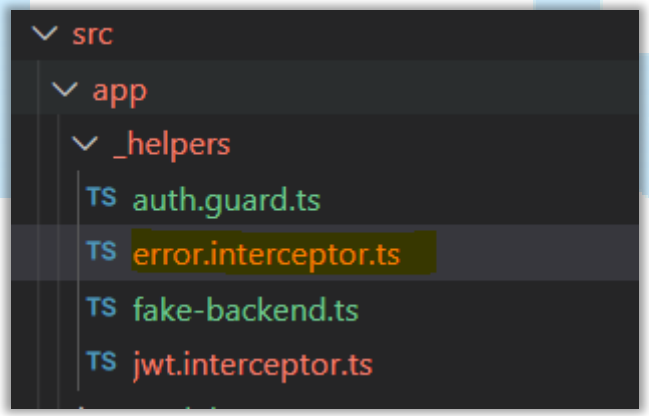
Step 4 – Create jwt interceptor to generate jwt token. Create new file inside _helpers as 'jwt.interceptor.ts'




```
import { Injectable } from '@angular/core';
import { HttpRequest, HttpHandler, HttpEvent, HttpInterceptor } from '@angular/com
mon/http';
import { Observable } from 'rxjs';

import { AuthenticationService } from '../_services/authentication.service'

@Injectable()
```

```
export class JwtInterceptor implements HttpInterceptor {
    constructor(private authenticationService: AuthenticationService) {}

    intercept(request: HttpRequest<any>, next: HttpHandler): Observable<HttpEvent<
any>> {
        // add authorization header with jwt token if available
        let currentUser = this.authenticationService.currentUserValue;
        if (currentUser && currentUser.token) {
            request = request.clone({
                setHeaders: {
                    Authorization: `Bearer ${currentUser.token}`
                }
            });
        }

        return next.handle(request);
    }
}
```

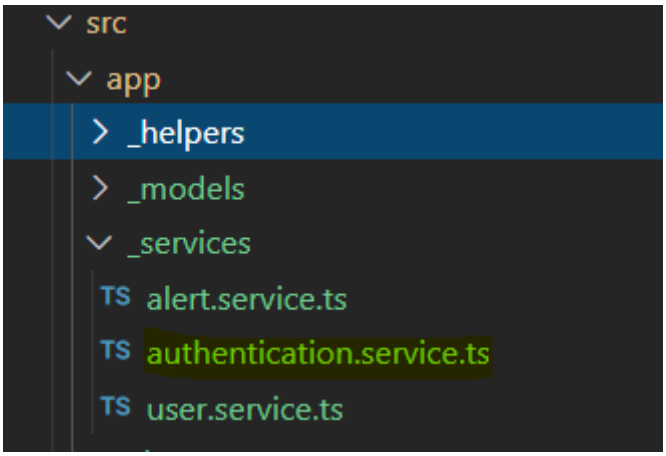
Step 5- Create error interceptor inside _helpers folder for errors




```
import { Injectable } from '@angular/core';
import { HttpRequest, HttpHandler, HttpEvent, HttpInterceptor } from '@angular/com
mon/http';
import { Observable, throwError } from 'rxjs';
import { catchError } from 'rxjs/operators';

import { AuthenticationService } from '../_services/authentication.service';

@Injectable()
export class ErrorInterceptor implements HttpInterceptor {
    constructor(private authenticationService: AuthenticationService) {}

    intercept(request: HttpRequest<any>, next: HttpHandler): Observable<HttpEvent<
any>> {
        return next.handle(request).pipe(catchError(err => {
```

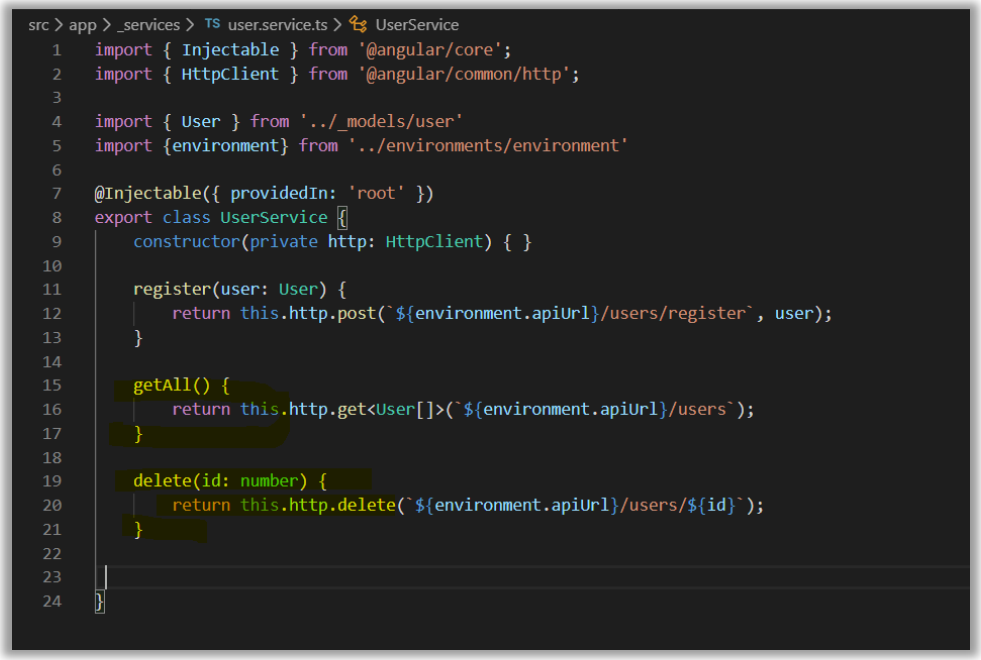
```
            if (err.status === 401) {
                // auto logout if 401 response returned from api
                this.authenticationService.logout();
                location.reload(true);
            }

            const error = err.error.message || err.statusText;
            return throwError(error);
        }))
    }
}
```

Step 6- Create authentication service inside _services folder.



```
import { Injectable } from '@angular/core';
import { Router, CanActivate, ActivatedRouteSnapshot, RouterStateSnapshot } from '
@angular/router';


import { AuthenticationService } from '../_services/authentication.service'

@Injectable({ providedIn: 'root' })
export class AuthGuard implements CanActivate {
    constructor(
        private router: Router,
        private authenticationService: AuthenticationService
    ) {}

    canActivate(route: ActivatedRouteSnapshot, state: RouterStateSnapshot) {
        const currentUser = this.authenticationService.currentUserValue;

        if (currentUser) {
            // authorised so return true
            return true;
        }
        // not logged in so redirect to login page with the return url
        this.router.navigate(['/login'], { queryParams: { returnUrl: state.url }})
;
        return false;
    }
}
```

Step 7- In the user.service.ts add the below code



Step 8- Modify home component both html and .ts file and add code from demo folder

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

import { User } from '../_models/user'
import {  AuthenticationService } from '../_services/authentication.service';
import {UserService} from '../_services/user.service'

@Component({
  selector: 'app-home',
  templateUrl: './home.component.html',
  styleUrls: ['./home.component.css']
})
export class HomeComponent implements OnInit {
  currentUser: User;
  users = [];

  constructor( private authenticationService: AuthenticationService,
    private userService: UserService) {
      this.currentUser = this.authenticationService.currentUserValue;
    }

  ngOnInit() {
    this.loadAllUsers();
  }

  deleteUser(id: number) {
    this.userService.delete(id)
        .pipe(first())
        .subscribe(() => this.loadAllUsers());
}

private loadAllUsers() {
    this.userService.getAll()
        .pipe(first())
        .subscribe(users => this.users = users);
}

}
```

Similarly modify login component, register component and app component.to add updated code from demo zip file

Step 12 – open app.module.ts file and import JWT and error interceptors as below

src > app > TS app.module.ts > ...

```
import { HttpClientModule,HTTP_INTERCEPTORS } from '@angular/common/http';
import { fakeBackendProvider } from './_helpers/fake-backend';
import { AlertComponent } from './alert/alert.component'

import { JwtInterceptor } from './_helpers/jwt.interceptor';
import { ErrorInterceptor } from './_helpers/error.interceptor'

@NgModule({
  declarations: [
    AppComponent,
    LoginComponent,
    RegisterComponent,
    HomeComponent,
    AlertComponent
  ],
  imports: [
    BrowserModule,
    ReactiveFormsModule,
    AppRoutingModule,
    HttpClientModule
  ],
  providers: [
    { provide: HTTP_INTERCEPTORS, useClass: JwtInterceptor, multi: true },
    { provide: HTTP_INTERCEPTORS, useClass: ErrorInterceptor, multi: true },
    fakeBackendProvider],
  bootstrap: [AppComponent]
})
```

Step 13 – Open fake-backend.ts file:

```
mport { Injectable } from '@angular/core';
import { HttpRequest, HttpResponse, HttpHandler, HttpEvent, HttpInterceptor, HTTP_
INTERCEPTORS } from '@angular/common/http';
import { Observable, of, throwError } from 'rxjs';
import { delay, mergeMap, materialize, dematerialize } from 'rxjs/operators';

// array in local storage for registered users
let users = JSON.parse(localStorage.getItem('users')) || [];

@Injectable()
export class FakeBackendInterceptor implements HttpInterceptor {
    intercept(request: HttpRequest<any>, next: HttpHandler): Observable<HttpEvent<
any>> {
        const { url, method, headers, body } = request;

        // wrap in delayed observable to simulate server api call
        return of(null)
            .pipe(mergeMap(handleRoute))
            .pipe(materialize()) // call materialize and dematerialize to ensure d
elay even if an error is thrown (https://github.com/Reactive-
Extensions/RxJS/issues/648)
            .pipe(delay(500))
```

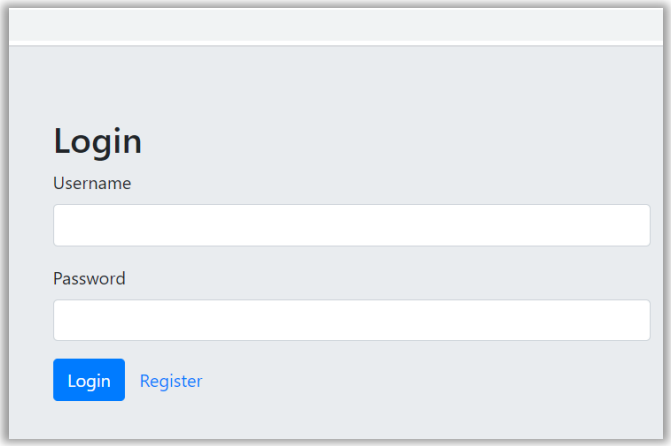
```
            .pipe(dematerialize());

        function handleRoute() {
            switch (true) {
                case url.endsWith('/users/register') && method === 'POST':
                    return register();
                case url.endsWith('/users/authenticate') && method === 'POST':
                    return authenticate();
                case url.endsWith('/users') && method === 'GET':
                        return getUsers();
                case url.match(/\/users\/\d+$/) && method === 'DELETE':
                        return deleteUser();
                default:
                    // pass through any requests not handled above
                    return next.handle(request);
            }
        }

        // route functions

        function register() {
            const user = body

            if (users.find(x => x.username === user.username)) {
                return error('Username "' + user.username + '" is already taken')
            }

            user.id = users.length ? Math.max(...users.map(x => x.id)) + 1 : 1;
            users.push(user);
            localStorage.setItem('users', JSON.stringify(users));

            return ok();
        }

        function authenticate() {
            const { username, password } = body;
            const user = users.find(x => x.username === username && x.password ===
password);
            if (!user) return error('Username or password is incorrect');
            return ok({
                id: user.id,
                username: user.username,
                firstName: user.firstName,
                lastName: user.lastName,
                token: 'fake-jwt-token'
            })
        }
```

```
        function getUsers() {
            if (!isLoggedIn()) return unauthorized();
            return ok(users);
        }

        function deleteUser() {
            if (!isLoggedIn()) return unauthorized();

            users = users.filter(x => x.id !== idFromUrl());
            localStorage.setItem('users', JSON.stringify(users));
            return ok();
        }

        // helper functions

        function ok(body?) {
            return of(new HttpResponse({ status: 200, body }))
        }

        function error(message) {
            return throwError({ error: { message } });
        }

        function unauthorized() {
            return throwError({ status: 401, error: { message: 'Unauthorised' } })
;
        }

        function isLoggedIn() {
            return headers.get('Authorization') === 'Bearer fake-jwt-token';
        }

        function idFromUrl() {
            const urlParts = url.split('/');
            return parseInt(urlParts[urlParts.length - 1]);
        }


    }
}

export const fakeBackendProvider = {
    // use fake backend in place of Http service for backend-less development
    provide: HTTP_INTERCEPTORS,
    useClass: FakeBackendInterceptor,
    multi: true
};
```

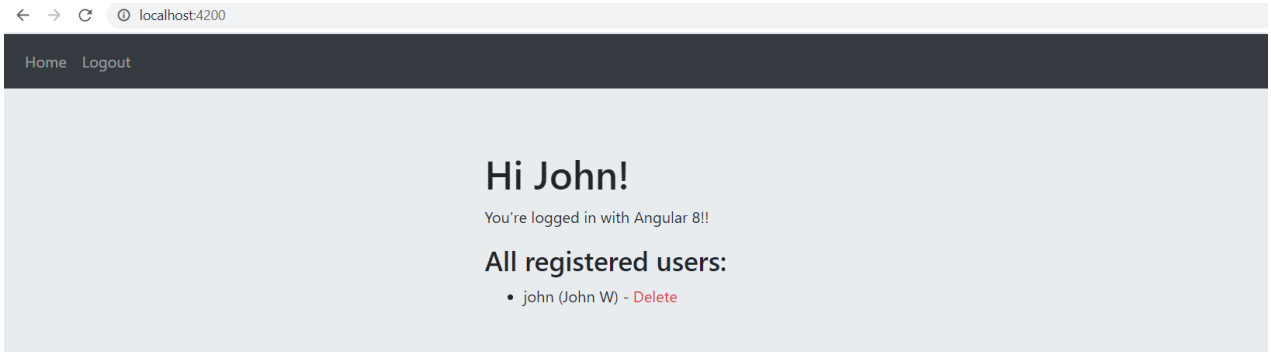
Step 15 – Open auth.guard.ts

```
import { Injectable } from '@angular/core';
import { Router, CanActivate, ActivatedRouteSnapshot, RouterStateSnapshot } from '
@angular/router';


import { AuthenticationService } from '../_services/authentication.service'

@Injectable({ providedIn: 'root' })
export class AuthGuard implements CanActivate {
    constructor(
        private router: Router,
        private authenticationService: AuthenticationService
    ) {}

    canActivate(route: ActivatedRouteSnapshot, state: RouterStateSnapshot) {
        const currentUser = this.authenticationService.currentUserValue;

        if (currentUser) {
            // authorised so return true
            return true;
        }
        // not logged in so redirect to login page with the return url
        this.router.navigate(['/login'], { queryParams: { returnUrl: state.url }})
;
        return false;
    }
}
```

Step 14 – Run app using ng serve command.



Now use the same user which we have registered in previous demo. (e.g. I used John), and try to login using same credentials



Application successfully logged in

You can create different users and register.