

# **CS489: Applied Software Development**

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Lesson 9:

Security

# Wholeness

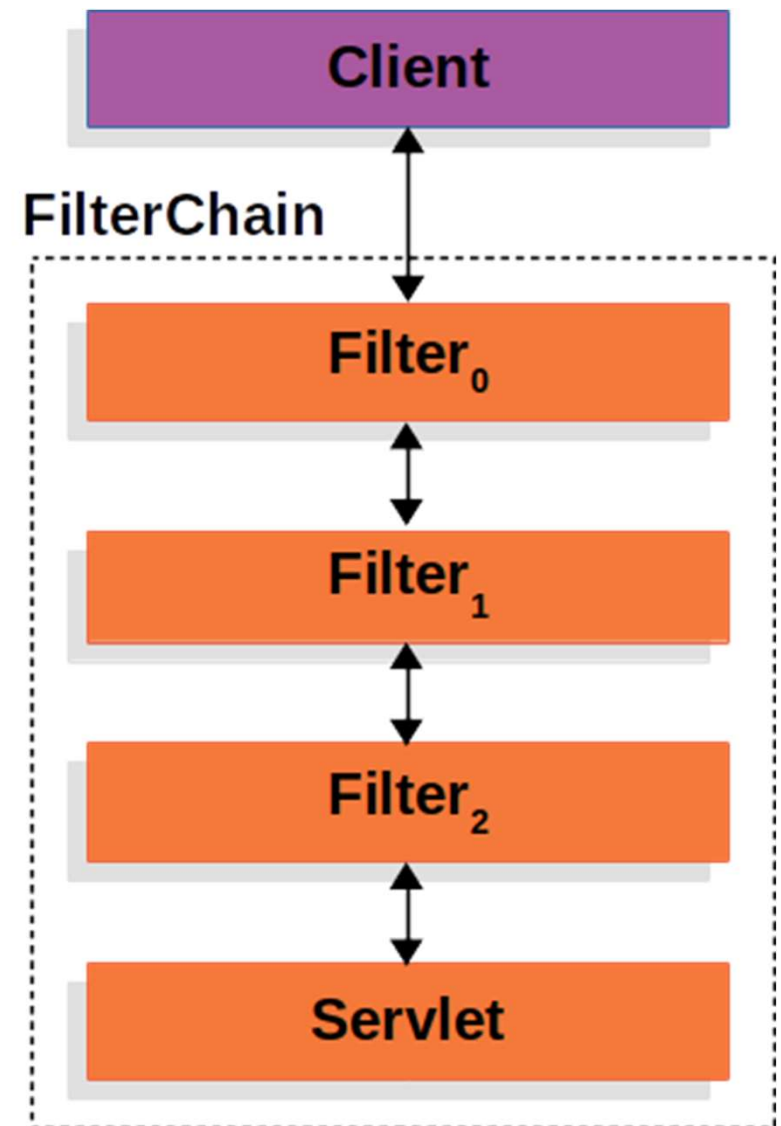
- Software Security describes methodologies, framework, processes and strategies for enhancing security and reducing vulnerabilities within software and its execution environment.
- Spring security offers a highly customizable authentication and access-control framework for Spring-based applications.
- Science of Consciousness: Action leads to Achievement. *Achievement leads to Fulfillment.*

# Aspects of Security

- Authentication: process of verifying a user's identity. Ascertaining that someone is who they claim to be (e.g. userID and password)
- Authorization: mechanism for establishing access-level and granting appropriate rights and privileges.
- Cryptography: Techniques for securing communication through Data encryption

# Key Concepts in Spring Security

- **SpringSecurityFilterChain:** For Servlet-driven Spring web applications, the Filter chain plays the central role for securing a given HTTP Request URI path.
- **Spring Boot Auto Configuration:** Simply adding the dependency named, `spring-boot-starter-security`, enables default config



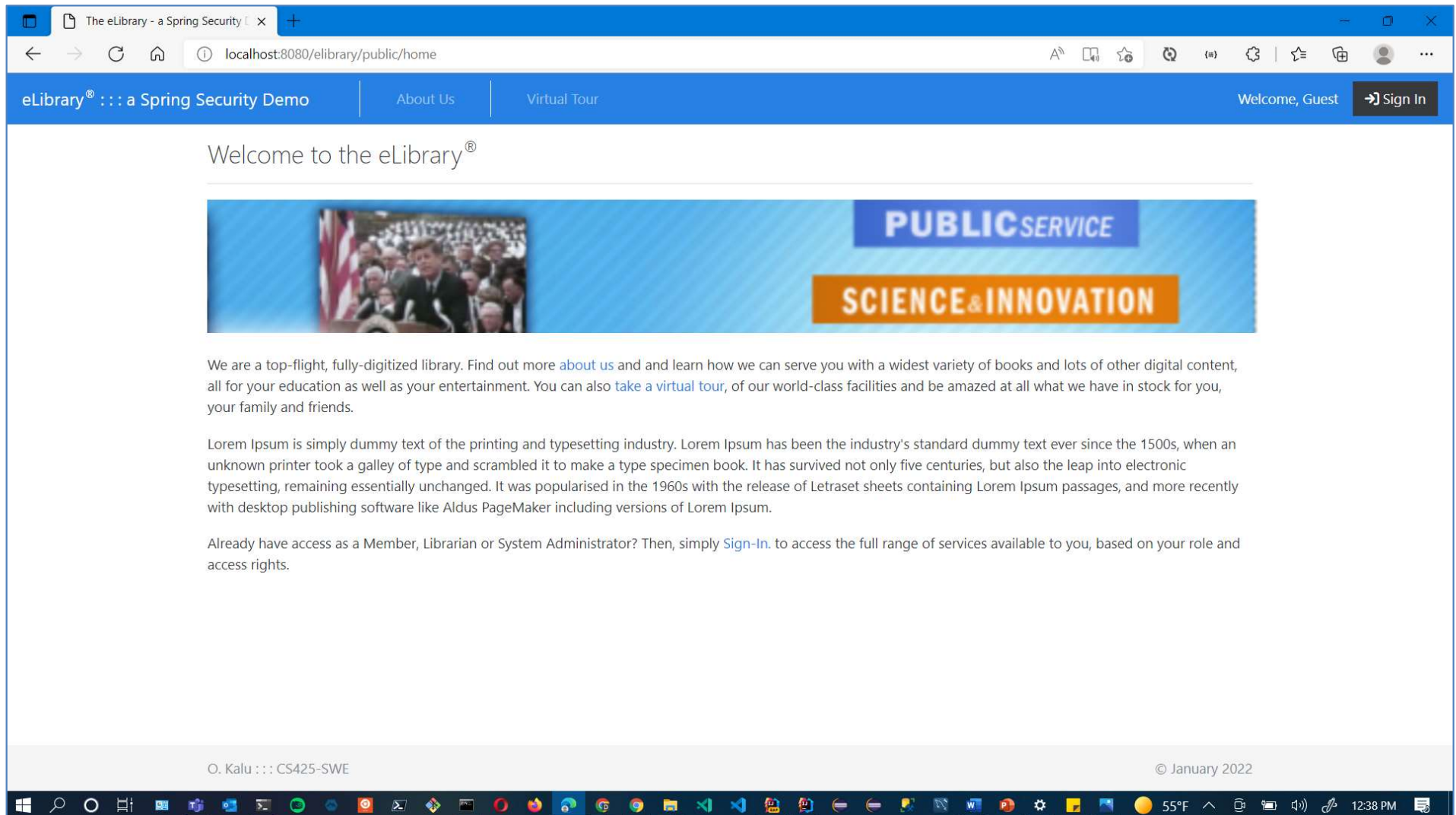
# Types of Authentication Mechanisms supported by Spring Security

- HTTP Basic Authentication: enabled in HTTP server or Servlet container
- Form-based, custom Database Authentication: Where we use a Database to store/authenticate the user credentials.
- LDAP-driven Authentication. e.g. Microsoft Windows Active Directory service
- OAuth/OpenID Connect Authentication e.g. Login with Google or Microsoft or Github or Facebook account
- Token-based Authentication: Using JSON web token (JWT)

# Spring Security API

- **AuthenticationManager**: is an interface with just one method named, `authenticate`, which processes an Authentication request.
- **AuthenticationProvider**: an interface that can be implemented by one or more classes that provide Authentication service using a given authentication mechanism e.g.  
`DaoAuthenticationProvider`,  
`LdapAuthenticationProvider`,  
`JwtAuthenticationProvider` etc.

# Implementing Spring Security for a webapp – Coding Demo






# Implementing Spring Security for a webapp – Coding Demo

The screenshot shows a web browser window with the address bar displaying 'localhost:8080/elibrary/public/login'. The page title is 'The eLibrary - a Spring Security Demo'. The navigation bar includes links for 'About Us' and 'Virtual Tour', and a 'Sign In' button. The main content area is titled 'Sign In' and contains two login options:

Use your Google Account via OAuth

Sign In with Google

Simply click on the Google logo below and sign in using your Google Account.

 Sign in with Google

Use your eLibrary Account

Sign In with your eLibrary Account

Enter your eLibrary Username and Password below, to sign in.

Username

Password

The footer of the browser window shows 'O. Kalu :: CS425-SWE' on the left and '© January 2022' on the right. The Windows taskbar at the bottom displays various application icons, the system clock showing 12:40 PM, and the temperature at 55°F.

The slide features decorative curved lines in the corners. In the top right, a thick, multi-layered arc curves from the edge towards the center, with colors transitioning from light orange to white. In the bottom left, a similar multi-layered arc curves from the edge towards the center, with colors transitioning from light orange to white. The main text is centered in a bold, dark blue font.

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