Overview

The Skillstream Application is a modern, responsive, and secure online learning platform built using the React and Spring Boot frameworks. The application provides an intuitive user interface for students to enroll in courses and manage their learning, as well as for administrators to add, remove, and update courses.

Architecture

The Skillstream Web Application follows a client-server architecture, where the client is built using React and the server is built using Spring Boot. The client and server communicate with each other using RESTful API endpoints, which are responsible for managing course and user data.

Client-Side Architecture

The client-side architecture is based on the React framework, which provides a component-based model for building UI components. The UI components are implemented using JavaScript, CSS, and HTML, and are organized into a hierarchical structure.

The top-level component is the App component, which serves as the entry point for the application. It contains the navigation bar and routing logic for rendering the appropriate components based on the URL path.

The next level of components are the pages, which are responsible for rendering the main content of the application. The pages are implemented as functional components and use hooks such as useState and useEffect to manage state and lifecycle.

Below the pages are the UI components, which are responsible for rendering individual elements of the user interface, such as buttons, forms, and tables. The UI components are implemented as functional components and use props to receive data and callbacks from their parent components.

Server-Side Architecture

The server-side architecture is based on the Spring Boot framework, which provides a robust and scalable platform for building RESTful API endpoints. The endpoints are implemented using Java, and are responsible for managing the database and providing data to the client.

The top-level component is the Application class, which serves as the entry point for the Spring Boot application. It configures the database connection and initializes the necessary beans and components.

The next level of components are the controllers, which are responsible for handling HTTP requests and returning responses. The controllers are implemented as classes and use annotations such as @RestController and @RequestMapping to define the endpoints and route requests to the appropriate methods.

Below the controllers are the services, which are responsible for implementing the business logic of the application, such as course enrollment and management. The services are implemented as classes and use annotations such as @Service to indicate that they are Spring-managed beans.

At the lowest level are the data access objects (DAOs), which are responsible for querying the database and returning data to the services. The DAOs are implemented using Spring Data JPA, which provides a convenient and efficient way to interact with relational databases.

Libraries and Frameworks

The Skillstream Web Application utilizes a number of libraries and frameworks, including:

React: A popular JavaScript framework for building modern web applications.

Spring Boot: A powerful Java framework for building robust and scalable web applications.

Spring Security: A security framework for managing authentication and authorization in web applications.

Axios: A JavaScript library for making HTTP requests to the server.

Bootstrap: A CSS framework for building responsive and mobile-first web pages.

MySQL: A relational database management system for storing course and user data.

Spring Data JPA: A Spring framework for working with relational databases using Java Persistence API (JPA).

Implementation

The Skillstream Web Application was implemented using a combination of React and Spring Boot, with the client and server components developed separately and then integrated using

RESTful API endpoints. The client-side code was organized into a hierarchical structure of components, with each component responsible for a specific part of the user interface.