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Description automatically generated

**CIS007-3 Comparative Integrated Systems – AY 24/25**

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**Software Architecture**

The game uses modular software architecture for better separation of concerns.

**Frontend (React js with VUE):**

The structure of the frontend is:

node\_modules : This folder contains all the external libraries, and packages required.

src: Source code for the application which includes (components, pages, routers and hooks).

**Backend (Spring Boot):**

The structure of the Spring Boot is:

pom.xml file which stores all the dependencies.

src: Source code for the application which includes (models, controllers and repositories).

**Event-Driven Architecture**

Events are triggered by player interactions within GUI. When a player click any button in the game the event handler associated with the button click is executed.

**Interoperability:**

This application is the combination of 3 languages (React, Spring Boot and PHP). The react is for interactive display, spring boot is for backend to communicate with the database and external api from where the game data is received.

The Spring Boot backend exposes REST APIs that the Vue frontend consumes. This is done using HTTP protocols (GET, POST, PUT, DELETE) to interact with resources. The backend also interacts with the external Banana API (<https://marcconrad.com/uob/banana/api.php>) to receive dynamic game data.

**Virtual Identity:**

For the virtual identity, JSON Web Token (JWT) is implemented through a secure login mechanism. The JWT is generated by the backend after user is logs in and the provided credentials are tested against the data in the database. After the generation of the token the token is passed to the frontend where it is stored in the local storage of the browser. Then the token is passed for every request made for better accountability. When it comes to virtual identity management major issue comes is data security. This issue is solved by storing the password only after it has been hashed.

**Other features:**

The application includes features like:

**Lives**: Allow players to attempt a question for 3 times.

**History**: Shows player their history of win or loss.