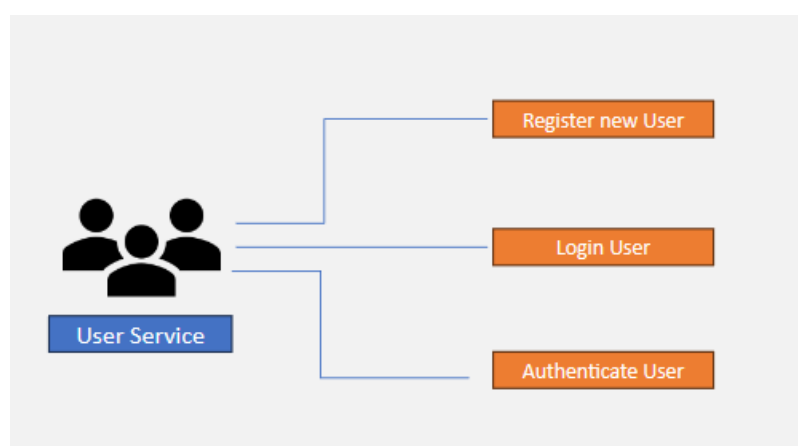# Capstone Application

A. Problem Statement:

Design and developed an e-commerce application encompassing three essential services: User, e-commerce, and Eureka. The user service will handle user authentication and registration with different user roles. The e-commerce service will manage products, their categories, carts and orders. Integrating the Eureka service will enable efficient service discovery, ensuring seamless communication between the application and the underlying services. Furthermore, the optional notification service can be incorporated to give email notifications to users on item purchases.
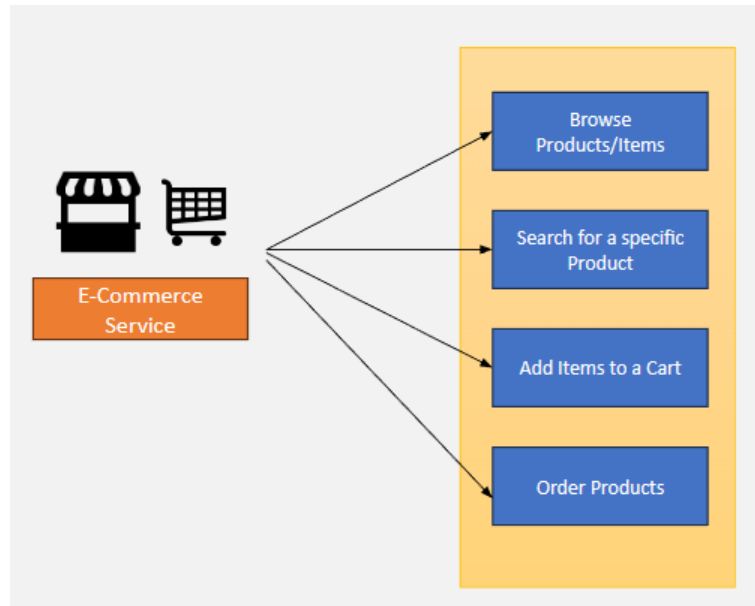
B. Features of the Application:

The application should include:

- **User Service:** Design and implement user service that will enable user registration and authentication, ensuring secure access to the platform. A role-based access control system will be implemented, allowing users different roles and permissions based on their assigned privileges. Users can manage their profiles, facilitating updating personal information as needed. These features provide a secure and personalised experience, allowing users to navigate and interact with the e-commerce application efficiently.
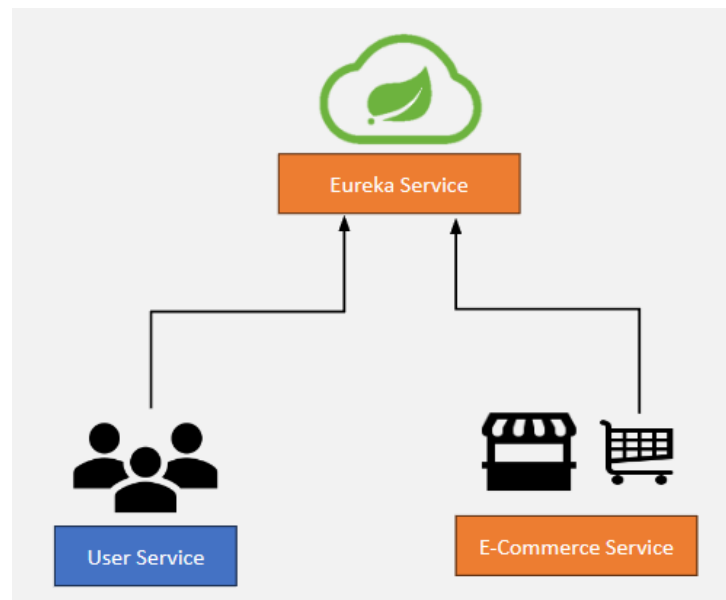

- **E-commerce Service(Main Application):** Design and implement the e-commerce service application to handle product management, including categories, cart functionality, and order processing. The e-commerce service will provide comprehensive features for managing

product catalogues, allowing seamless organisation and categorisation of products. Users can browse and add products to their cart, with the service facilitating smooth cart management and updates. Additionally, the e-commerce service will handle the processing of orders.
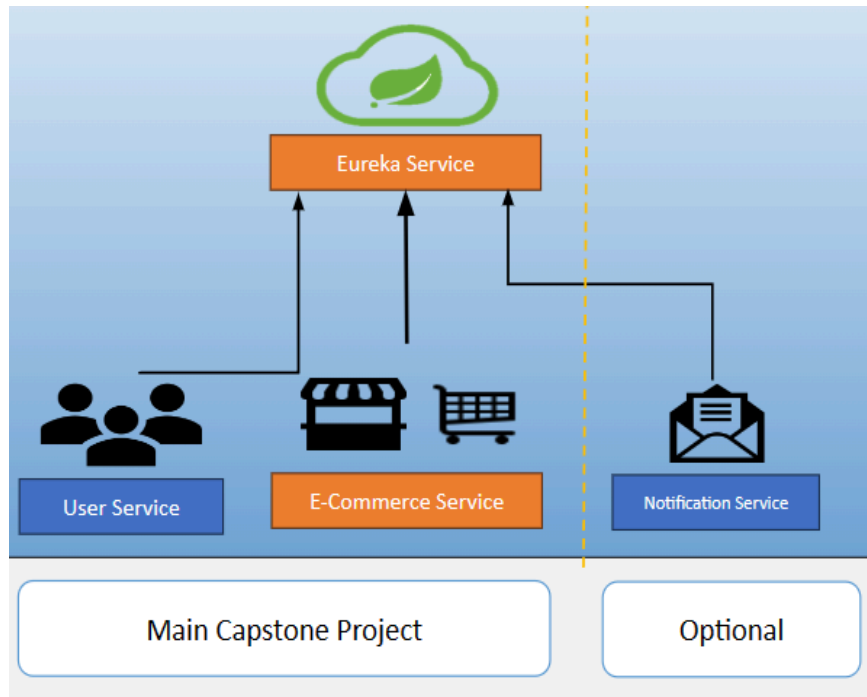

- **Eureka Service:** Design and implement the Eureka service within the e-commerce application to streamline service discovery and management. The Eureka service will serve as a registry for microservices, allowing automatic registration and discovery of services within the application ecosystem.

- **Notification Service (Optional):** Design and develop a notification service application for an e-commerce web application. The application should notify users when they purchase a

product through the e-commerce application through an email notification. This service will only be called when an order is placed.

C. Steps to Create the Project:

Step 1: Setup a Spring Boot Project:

1. Create a new Spring Boot project using your preferred IDE or start.spring.io.

2. Include the necessary dependencies:

   i.   Spring web

   ii. Spring version - 2.7.5

   iii. Spring Data JPA

   iv. MySQL Driver

   v.   Java version - 17

   vi. Spring Security

   vii. Spring Boot Devtools

   viii. Eureka Server

   ix. Spring validation

Step 2: Design User Service:

1. The User service handles user registration, authentication, and profile management, providing a secure and personalised experience within the e-commerce application.

2. It implements role-based access control for managing user roles and permissions, ensuring appropriate access to features and resources.

Step 3: Design E-commerce Service:

1. The e-commerce service manages the product catalogue, including categories, cart functionality, and order processing within the application.

2. It enables seamless browsing, cart management, and efficient order fulfilment, enhancing the overall user experience in the e-commerce platform.

Step 4: Design Eureka Service:

1. The Eureka service enables efficient service discovery and management within the e-commerce application.

2. It automates the registration of microservices, simplifying communication and ensuring reliable interactions between different services.

Step 5: Design Notification Service (Optional):

1. The notification service in the e-commerce application facilitates email notifications upon order placement.

2. This service will only be called when an order is placed.

Note: Each service is discussed in detail in their respective documents.