**Project Documentation for Currency Rate Bot in Spring Boot**

This documentation outlines the process of creating a Spring Boot application to provide real-time currency exchange rates, user subscriptions to specific currency pairs, and administrative functionality for managing users and subscriptions. The bot allows users to query exchange rates, subscribe to daily updates, and manage their subscriptions. Administrators have access to user lists and their subscriptions.

**1. Project Description**

The main functionality of the bot includes:

* **Querying currency exchange rates**: The bot provides up-to-date exchange rates for requested currency pairs (e.g., USD to EUR, GBP to EUR).
* **Subscription management**: Users can subscribe to receive daily updates on exchange rates for specific currency pairs, view their current subscriptions, and unsubscribe from them.
* **Admin functionality**: Administrators can view all registered users and their subscription details.

**Core Features:**

* **Get Current Exchange Rate**: User requests an exchange rate for a currency pair, and the bot provides the latest rate.
* **Subscribe to Currency Pair**: Users can subscribe to daily exchange rate updates for chosen currency pairs.
* **Unsubscribe from Currency Pair**: Users can remove their subscriptions.
* **View Subscriptions**: Users can view all their active currency pair subscriptions.
* **Admin Functionality**: Admins can view a list of all users and their associated currency pair subscriptions.

**2. Repository Layer**

The Repository layer is responsible for interacting with the database. It uses **Spring Data JPA** to persist entities related to users, roles, subscriptions, and currency.

**3. Service Layer**

The Service layer handles business logic and orchestrates between the repository and other application components, such as controllers or external APIs.

**4. Entity Layer**

Entities represent the database tables and are the objects that JPA will map to the underlying database. Below are examples of the User, Subscription, Role and Currency entities.

**5. DTO Layer**

Data Transfer Objects (DTOs) are used to transfer data between layers or to external systems. They help keep the entity model isolated and protect internal details from being exposed to the client.

**6. Admin Functionality**

The admin functionality allows administrators to view a list of users and their subscriptions.

**Conclusion**

This documentation outlines the necessary layers and components needed to build a currency exchange rate bot using Spring Boot. The bot provides essential functionality for users to subscribe to currency rate updates, manage their subscriptions, and for administrators to monitor users and their subscriptions.

Each layer—from the repository to the service, entity, and DTO—plays a specific role in ensuring the proper flow of data, enabling a robust and maintainable application.