Creating a Use Case Diagram for "BookBuddy" - An Online Library Management System

Background: The town of Bookhaven is revolutionizing its public library system with the launch of "BookBuddy," a digital library management platform. BookBuddy is designed to modernize the way residents access library resources, manage their accounts, and engage with community reading programs. The platform aims to cater to a wide range of users, including students, educators, avid readers, and administrative staff, offering functionalities from digital book rentals to interactive reading clubs.

As BookBuddy integrates various services, it's crucial to map out the interactions and relationships among different users and the system. For example:

- **Students** and **Educators** might have different access levels to educational resources.

- The **Book Rental** use case could include an **Extension for Late Returns** and might include a **Fine Calculation** use case.

- **Reading Club Management** could be a specialized use case for **Community Engagement** with various associations with users.

Your Task: Develop a comprehensive use case diagram for BookBuddy, including:

- At least **10 associations** between actors and use cases.

- A minimum of **2 generalizations** among actors.

- At least **3 extends** in use cases.

- A minimum of **4 includes** within use cases.

Focus on capturing the multifaceted nature of the BookBuddy system, reflecting the diverse needs and interactions within a modern online library environment.

Definitions of Relation Types:

- **Association:** A link between an actor and a use case, representing interaction.

- **Generalization:** A hierarchical relationship where one actor inherits the roles and characteristics of another.

- **Extend:** A relationship where one use case extends another, adding new behaviors under certain conditions.

- **Include:** A relationship where one use case is an integral part of the execution of another use case.

Scenario Overview:

1. **Primary Actors:**

   - Students.

   - Educators.

   - Readers.

   - Library Administrators.

2. **Key System Functions:**

   - Digital Book Rental.

   - Account Management.

   - Reading Club Participation.

   - Community Event Notifications.

Activity:

1. **Diagram Development:**

   - Construct a use case diagram for BookBuddy, incorporating the required relations.

   - Ensure all diagram elements are clearly labeled and logically organized.

2. **Justification and Explanation:**

   - For each type of relation used in your diagram (association, generalization, extend, include), provide a brief rationale based on the BookBuddy scenario.

Deliverable:

- A detailed use case diagram for BookBuddy.

- A document explaining the purpose and application of each relation type (except Associations) in your diagram, supported by the scenario context.