***Experiment-3***

In a Book Recommendation System, several entities and their relationships need to be considered to design an efficient database structure following normalization rules. Here are some of the main entities, their relationships, and related attributes:

**Entities:**

**1. User:**

**Attributes:**

* UserID (Primary Key)
* Username
* Email
* Password
* First Name
* Last Name
* Registration Date
* Last Login Date.

**2.Book**

**Attributes:**

* BookID (Primary Key)
* Title
* Author
* ISBN
* Cover Image

**5. BookRating**

**Attributes:**

* RatingID (Primary Key)
* UserID (Foreign Key)
* BookID (Foreign Key)

**6.Recommendation**

**Attributes:**

* RecommendationID (Primary Key)
* UserID (Foreign Key)
* RecommendedBookID (Foreign Key)

**7. Admi**n

**Attributes:**

AdminID (Primary Key)

Username Email

Password

First Name,

Last Name

**Relationships:**

**Use**r has a **One-to-Many** relationship with **UserActivity** (One user can have multiple activities like views, favorites, and ratings).

**User**  has a **Many-to-Many** relationship with **Book** through **FavoriteBooks** (One user can have many favorite books, and one book can be a favorite for many users).

**User** has a **One-to-Many**  relationship with **BookRating** (One user can provide multiple ratings for different books).

**User** has a **One-to-Many** relationship with **Recommendation** (One user can receive multiple book recommendations).

**Attributes for Normalization:**

1. Ensure that each entity has a unique primary key attribute to uniquely identify each record.

2. Normalize attributes by separating them into their smallest, meaningful components. For example, split the user's name into first name and last name instead of storing it as a single attribute.

4. Use foreign keys to establish relationships between entities.

5. Ensure that attributes have appropriate data types (e.g., use integer for IDs.).

6. Apply indexing to frequently queried attributes for improved database performance.

Normalization should follow the rules of First Normal Form (1NF), Second Normal Form (2NF), Third Normal Form (3NF), and so on to minimize data redundancy and maintain data integrity. The actual level of normalization depends on the specific requirements and complexities of your Book Recommendation System.

