

### **1. Database Schema**

**Tables and Columns**:

* **User Table**:
  + user\_id (Primary Key)
  + name (String)
  + email (String, unique)
  + password (String, hashed)
  + profile\_image (String, URL or file path)
  + location (String)
* **Resource Table**:
  + resource\_id (Primary Key)
  + user\_id (Foreign Key referencing User.user\_id)
  + title (String)
  + description (Text)
  + images (String, URL or file path)
  + category (String)
  + availability (String)
  + date\_posted (Date)
* **Message Table**:
  + message\_id (Primary Key)
  + sender\_id (Foreign Key referencing User.user\_id)
  + receiver\_id (Foreign Key referencing User.user\_id)
  + content (Text)
  + timestamp (Datetime)
* **Review Table**:
  + review\_id (Primary Key)
  + resource\_id (Foreign Key referencing Resource.resource\_id)
  + user\_id (Foreign Key referencing User.user\_id) – the user who created the review
  + reviewer\_id (Foreign Key referencing User.user\_id) – the user who left the review
  + rating (Integer, e.g., 1-5)
  + comment (Text)
  + timestamp (Datetime)
* **Reservation Table**:
  + reservation\_id (Primary Key)
  + resource\_id (Foreign Key referencing Resource.resource\_id)
  + user\_id (Foreign Key referencing User.user\_id)
  + start\_date (Date)
  + end\_date (Date)
  + status (String, e.g., 'pending', 'approved', 'declined')
  + created\_at (Datetime)
* **UserRating Table**:
  + rating\_id (Primary Key)
  + rated\_user\_id (Foreign Key referencing User.user\_id) – the user receiving the rating
  + reviewer\_id (Foreign Key referencing User.user\_id) – the user giving the rating
  + rating (Integer, e.g., 1-5)
  + timestamp (Datetime)

### **2. ER Diagram Explanation**

**Relationships**:

* **User and Resource**:
  + A User can create multiple Resources (one-to-many relationship).
* **User and Message**:
  + A User can send and receive multiple Messages (one-to-many relationship for both sender and receiver).
* **User and Review**:
  + A User can leave reviews on Resources, and a Resource can have multiple Reviews.
  + A Review is linked to the User who created the resource and the Reviewer who wrote the review.
* **User and Reservation**:
  + A User can make multiple Reservations (one-to-many relationship).
* **Resource and Reservation**:
  + A Resource can have multiple Reservations (one-to-many relationship).
* **UserRating**:
  + Represents a User receiving ratings from other users. Each record links the rated\_user\_id with the reviewer\_id.

### **3. ER Diagram Description**

Here is a textual description of the ER diagram relationships:

* **User**:
  + Primary Key: user\_id
  + Relationships:
    - **has** Resources (one-to-many)
    - **sends** and **receives** Messages (one-to-many)
    - **writes** Reviews for Resources (one-to-many)
    - **receives** UserRatings (one-to-many)
* **Resource**:
  + Primary Key: resource\_id
  + Foreign Key: user\_id (references User)
  + Relationships:
    - **has** Reviews (one-to-many)
    - **has** Reservations (one-to-many)
* **Message**:
  + Primary Key: message\_id
  + Foreign Keys: sender\_id, receiver\_id (both reference User)
* **Review**:
  + Primary Key: review\_id
  + Foreign Keys: resource\_id (references Resource), user\_id, reviewer\_id (both reference User)
* **Reservation**:
  + Primary Key: reservation\_id
  + Foreign Keys: resource\_id (references Resource), user\_id (references User)
* **UserRating**:
  + Primary Key: rating\_id
  + Foreign Keys: rated\_user\_id, reviewer\_id (both reference User)