# MongoDB Database Schema for Smart Knowledge Hub

## Users Collection

{  
 "\_id": ObjectId,  
 "name": String,  
 "email": String,  
 "passwordHash": String,  
 "role": { "type": String, "enum": ["user", "admin"] },  
 "profilePicture": String,  
 "preferences": [String],  
 "joinedAt": Date,  
 "lastLogin": Date  
 }

## Books Collection

{  
 "\_id": ObjectId,  
 "title": String,  
 "author": String,  
 "genre": String,  
 "description": String,  
 "coverImage": String,  
 "publishedDate": Date,  
 "pages": Number,  
 "ratings": [{ "userId": ObjectId, "rating": Number, "comment": String }],  
 "availability": Boolean,  
 "addedBy": ObjectId,  
 "addedAt": Date  
 }

## Genres Collection

{  
 "\_id": ObjectId,  
 "name": String,  
 "description": String,  
 "books": [ObjectId]  
 }

## Book Requests Collection

{  
 "\_id": ObjectId,  
 "userId": ObjectId,  
 "bookTitle": String,  
 "author": String,  
 "requestedAt": Date,  
 "status": { "type": String, "enum": ["pending", "approved", "rejected"] }  
 }

## Reviews Collection

{  
 "\_id": ObjectId,  
 "userId": ObjectId,  
 "bookId": ObjectId,  
 "rating": Number,  
 "review": String,  
 "reviewedAt": Date  
 }

**Borrowed Books Collection**

**Schema:**

{

"\_id": ObjectId,

"userId": ObjectId,

"bookId": ObjectId,

"borrowedAt": Date,

"dueDate": Date,

"returned": Boolean

}

**Wishlist Collection**

**Schema:**

{

"\_id": ObjectId,

"userId": ObjectId,

"books": [ObjectId],

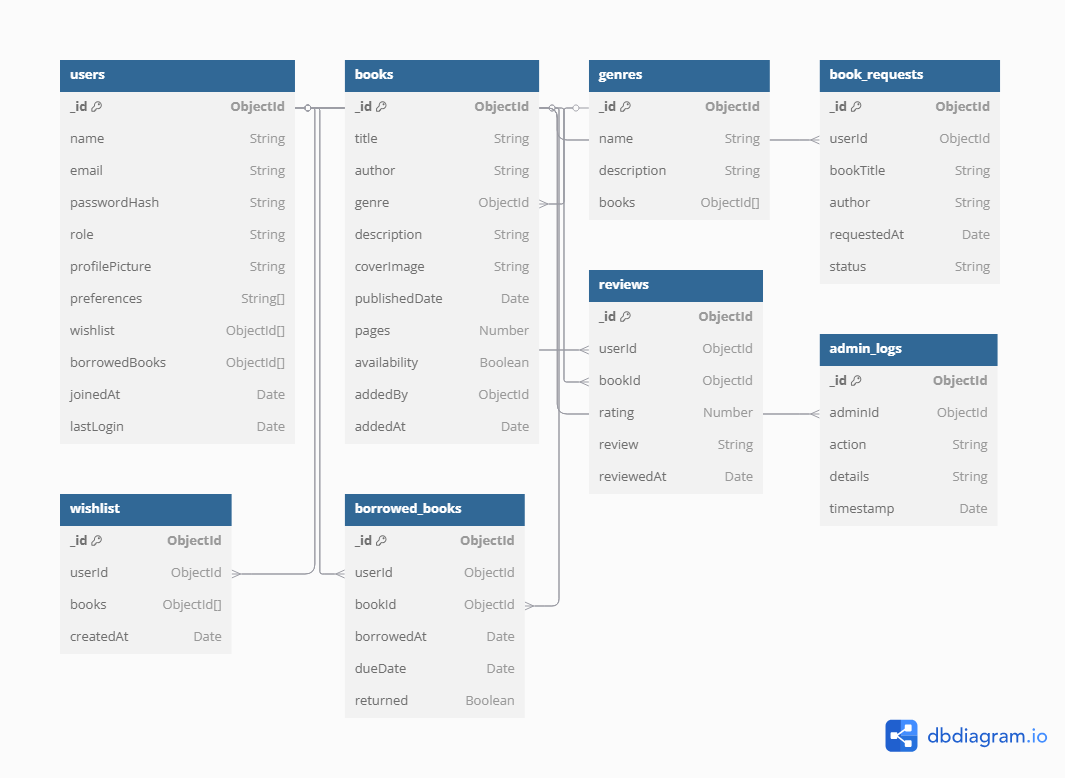
"createdAt": Date

}

**MongoDB Database Schema & Relationships for Smart Knowledge Hub**

**Entity Relationships**

| **Entity 1** | **Entity 2** | **Relationship Type** | **Description** |
| --- | --- | --- | --- |
| Users | Books | Many-to-Many | A user can borrow multiple books, and a book can be borrowed by multiple users. |
| Users | Genres | Many-to-Many | A user can have preferred genres, and a genre can be followed by multiple users. |
| Users | Book Requests | One-to-Many | A user can request multiple books, but a request belongs to one user. |
| Users | Reviews | One-to-Many | A user can review multiple books. |
| Users | Admin Logs | One-to-Many | An admin can have multiple log entries. |
| Users | Wishlist | One-to-Many | A user can have a wishlist containing multiple books. |
| Users | Borrowed Books | One-to-Many | A user can borrow multiple books. |
| Books | Genres | Many-to-One | A book belongs to one genre, but a genre contains multiple books. |
| Books | Reviews | One-to-Many | A book has multiple reviews from different users. |
| Book Requests | Users | Many-to-One | A request belongs to one user. |
| Reviews | Users | Many-to-One | A review is written by one user. |
| Reviews | Books | Many-to-One | A review is for one book. |
| Admin Logs | Users | Many-to-One | A log entry is created by one admin. |



**Example data for the collections:**

**1. Users Collection**

**Schema & Example Data:**

**{**

**"\_id": ObjectId("603d2149e77d1a06d48f90eb"),**

**"name": "Alice Johnson",**

**"email": "alice@example.com",**

**"passwordHash": "hashedpassword123",**

**"role": "user",**

**"profilePicture": "profile\_alice.jpg",**

**"preferences": ["Science Fiction", "Mystery"],**

**"wishlist": [ObjectId("603d2149e77d1a06d48f90ec")],**

**"borrowedBooks": [ObjectId("603d2149e77d1a06d48f90ed")],**

**"joinedAt": ISODate("2024-01-10T10:00:00Z"),**

**"lastLogin": ISODate("2025-03-15T15:45:00Z")**

**}**

**2. Books Collection**

**Schema & Example Data:**

**{**

**"\_id": ObjectId("603d2149e77d1a06d48f90ec"),**

**"title": "The Great Adventure",**

**"author": "John Doe",**

**"genre": ObjectId("603d2149e77d1a06d48f90ee"),**

**"description": "An epic journey of discovery and survival.",**

**"coverImage": "great\_adventure.jpg",**

**"publishedDate": ISODate("2020-06-15T00:00:00Z"),**

**"pages": 320,**

**"ratings": [{ "userId": ObjectId("603d2149e77d1a06d48f90eb"), "rating": 5, "comment": "Amazing read!" }],**

**"availability": true,**

**"addedBy": ObjectId("603d2149e77d1a06d48f90ef"),**

**"addedAt": ISODate("2025-02-25T12:30:00Z")**

**}**

**3. Genres Collection**

**Schema & Example Data:**

**{**

**"\_id": ObjectId("603d2149e77d1a06d48f90ee"),**

**"name": "Science Fiction",**

**"description": "Books exploring futuristic and scientific concepts.",**

**"books": [ObjectId("603d2149e77d1a06d48f90ec")]**

**}**

**4. Book Requests Collection**

**Schema & Example Data:**

**{**

**"\_id": ObjectId("603d2149e77d1a06d48f90f0"),**

**"userId": ObjectId("603d2149e77d1a06d48f90eb"),**

**"bookTitle": "New Sci-Fi Novel",**

**"author": "Jane Smith",**

**"requestedAt": ISODate("2025-03-01T08:15:00Z"),**

**"status": "pending"**

**}**

**5. Wishlist Collection**

**Schema & Example Data:**

**{**

**"\_id": ObjectId("603d2149e77d1a06d48f90f1"),**

**"userId": ObjectId("603d2149e77d1a06d48f90eb"),**

**"books": [ObjectId("603d2149e77d1a06d48f90ec")],**

**"createdAt": ISODate("2025-03-10T09:30:00Z")**

**}**

**6. Borrowed Books Collection**

**Schema & Example Data:**

**{**

**"\_id": ObjectId("603d2149e77d1a06d48f90f2"),**

**"userId": ObjectId("603d2149e77d1a06d48f90eb"),**

**"bookId": ObjectId("603d2149e77d1a06d48f90ec"),**

**"borrowedAt": ISODate("2025-03-05T14:00:00Z"),**

**"dueDate": ISODate("2025-03-20T14:00:00Z"),**

**"returned": false**

**}**

**7. Reviews Collection**

**Schema & Example Data:**

**{**

**"\_id": ObjectId("603d2149e77d1a06d48f90f3"),**

**"userId": ObjectId("603d2149e77d1a06d48f90eb"),**

**"bookId": ObjectId("603d2149e77d1a06d48f90ec"),**

**"rating": 4,**

**"review": "A captivating story with an intriguing plot.",**

**"reviewedAt": ISODate("2025-03-12T10:20:00Z")**

**}**