DBMS PROJECT

Library Management System

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ER Diagram:
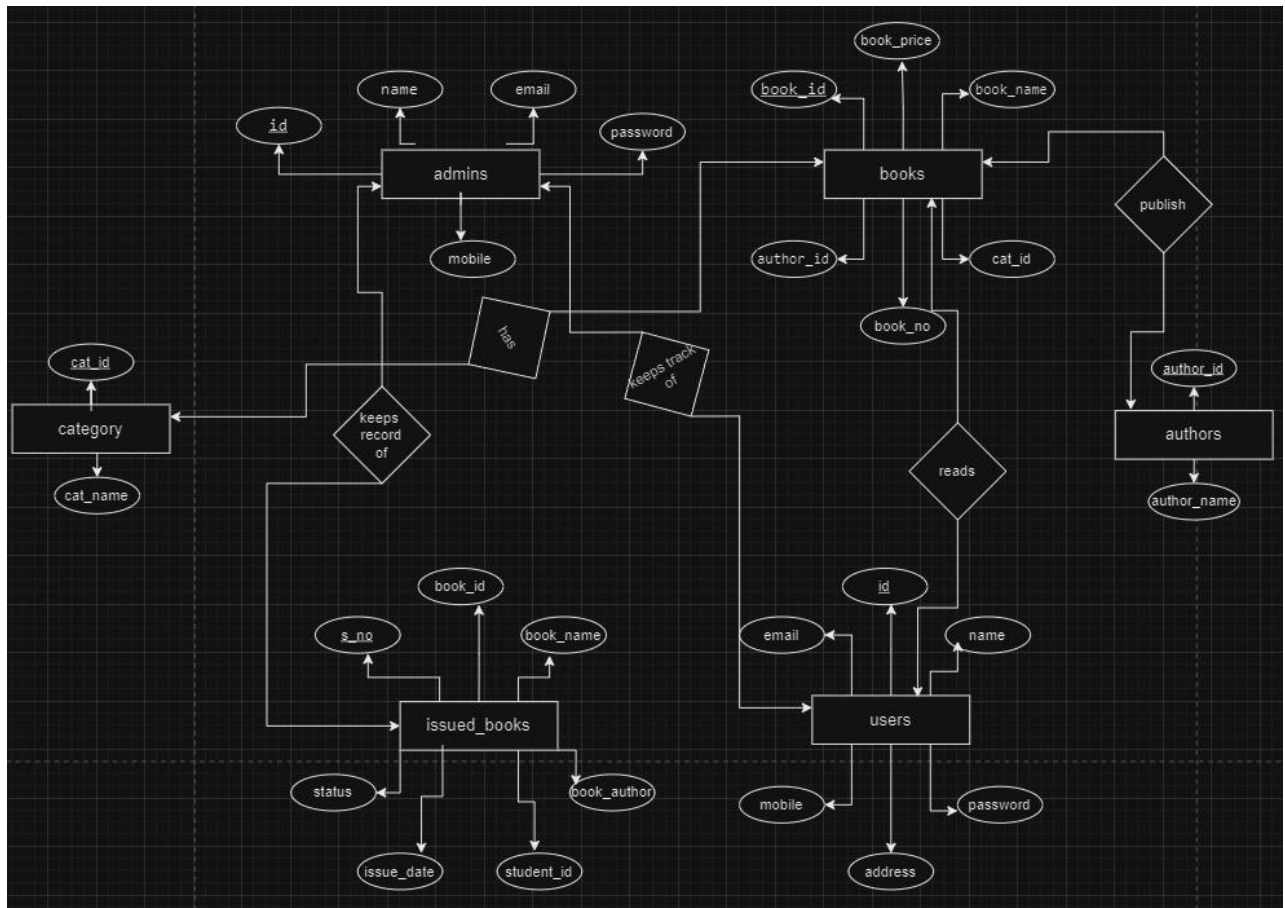
Current Normal Form:

•admins table:

Primary Key: id

Attributes: id, name, email, password, mobile

2NF Analysis: The admins table is already in 2NF as all non-key attributes are fully functionally dependent on the primary key (id).

3NF Analysis: The admins table is also in 3NF because there are no transitive dependencies.

•authors table:

Primary Key: author_id

Attributes: author_id, author_name

2NF Analysis: The authors table is in 2NF as all non-key attributes are fully functionally dependent on the primary key (author_id).

3NF Analysis: The authors table is also in 3NF because there are no transitive dependencies.

•books table:

Primary Key: book_id

Attributes: book_id, book_name, author_id, cat_id, book_no, book_price

2NF Analysis: The books table is in 2NF as all non-key attributes (book_name, author_id, cat_id, book_no, book_price) are fully functionally dependent on the primary key (book_id).

3NF Analysis: However, there could be transitive dependencies between author_id and book_name, and between cat_id and book_name if the tables for authors and category also have similar dependencies.

To decompose books table into 3NF:

books table can be decomposed into books table with attributes (book_id, book_name, author_id, cat_id) and a new book_details table with attributes (book_id, book_no, book_price).

•**category table**:

Primary Key: cat_id

Attributes: cat_id, cat_name

2NF and 3NF Analysis: The category table is in 2NF and 3NF as all attributes are fully functionally dependent on the primary key (cat_id) and there are no transitive dependencies.

•**issued_books table:**

Primary Key: s_no

Attributes: s_no, book_no, book_name, book_author, student_id, status, issue_date

2NF Analysis: There could be partial dependencies in the table. For instance, book_name and book_author may depend on book_no, not s_no.

To decompose issued_books table:

It can be decomposed into an issue_details table with attributes (s_no, student_id, status, issue_date) and a new book_info table with attributes (book_no, book_name, book_author).

- **users table:**

Primary Key: id

Attributes: id, name, email, password, mobile, address

2NF and 3NF Analysis: The users table is in 2NF and 3NF as all attributes are fully functionally dependent on the primary key (id) and there are no transitive dependencies.

In summary, most tables are in 3NF, with some potential for decomposition, especially in the books and issued_books tables. By separating data into smaller tables, data redundancy is reduced, and data integrity is increased.