ASSIGNMENT-01

Name : K. Gayathri

Reg NO : 192311448

Course code : CSA0593

course Name : Database Management system for transaction Management

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Academic library system with digital Resources

create a database for a library that manages both physical books and digital resources.

Requirements:

Design tables for books, e-books, journals, authors, and user checkout history.

Write stored procedures to handle checkouts, returns and overdue fines for physical and digital items. give

Write queries to track popular titles, user borrowing history, and utilization rates of digital vs physical resources add triggers to update resaurce availabilty in real-time and notify users when reserved items are available.

Here three types of ERD Models are there

1. conceptual ERD Model
2. Logical ERD Model
3. physical ERD Model.

conceptual ERD Model:

- correctly identified entities and relationships
- consider adding an entity for "category" to further normalize the data.

Logical ERD Model:

well defined attributes for each entity

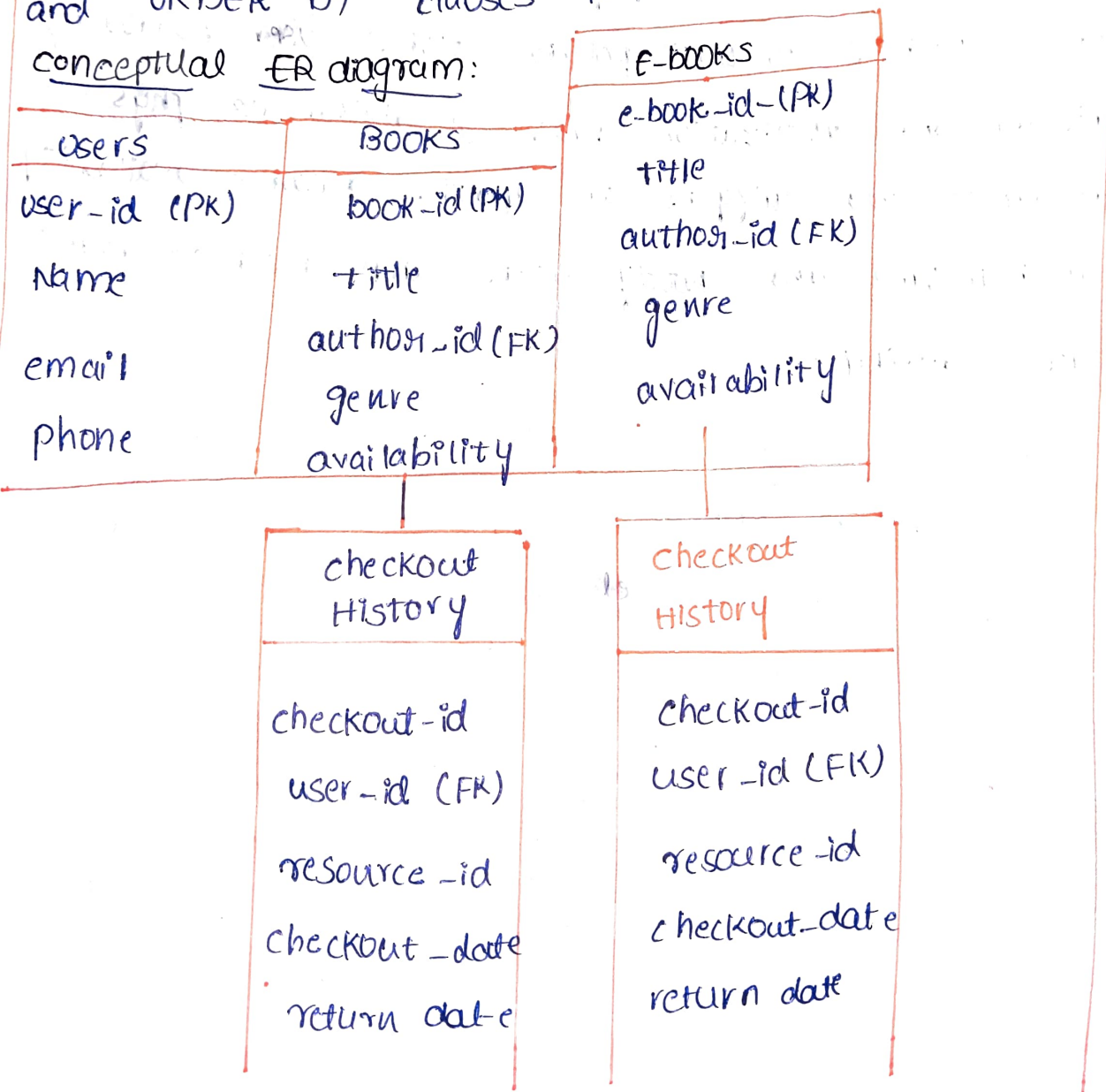
consider adding a "status" attribute to the Enrollment entity (e.g., "enroled", "completed", "inprogress").

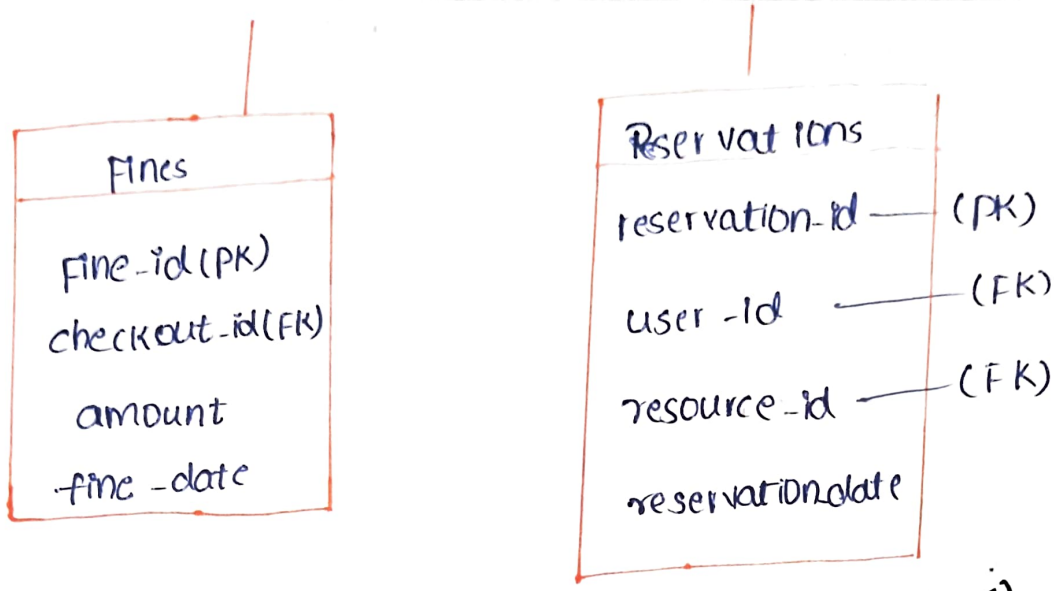
Physical ERD Model:

Proper use of primary keys, foreign keys, and data types

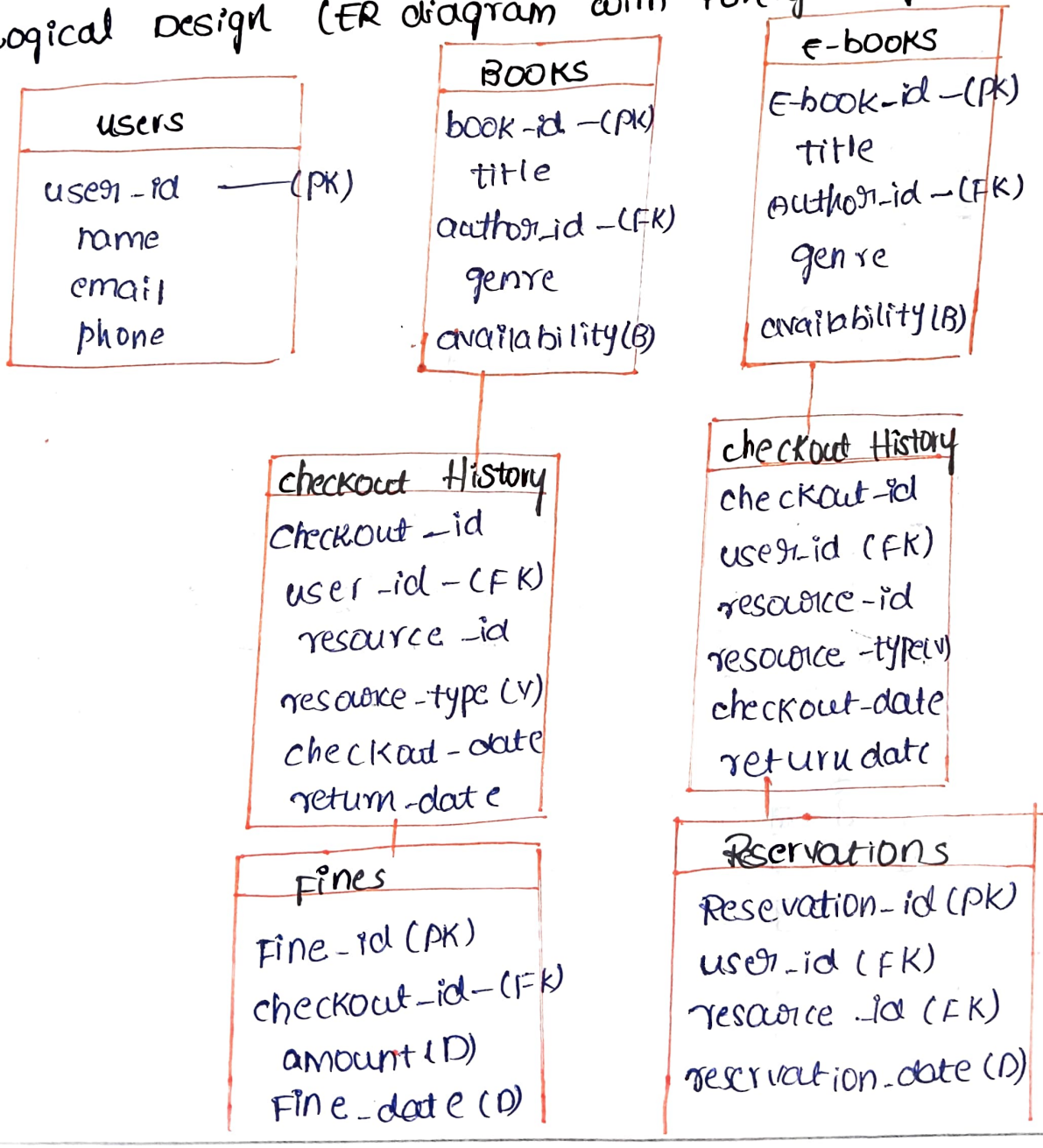
consider indexing colums used in WHERE, JOIN and ORDER BY clauses for improved performance.

conceptual ER diagram:

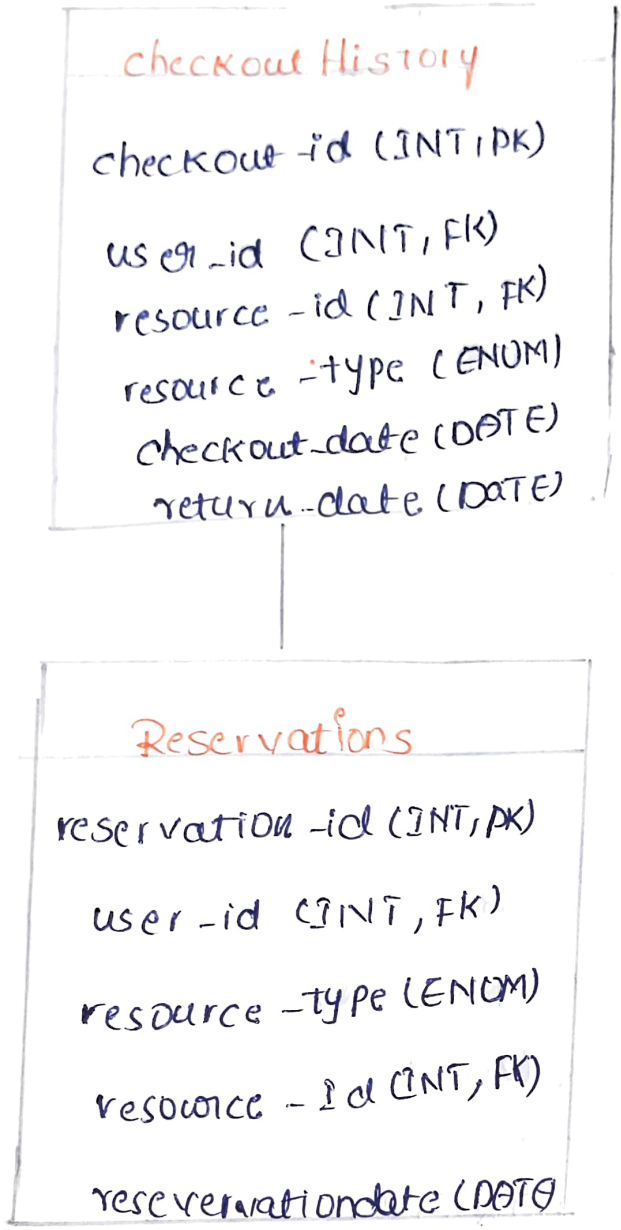




Logical Design (ER diagram with Foreign keys)



Physical ER-Diagram for the Academic Library System



SQL Statements for the Academic Library system.

Table creation.

```
CREATE TABLE Authors (
    Author_ID INT primary key,
    Name VARCHAR(100),
    Biography TEXT
);
```

```
CREATE TABLE BOOKS (
    BOOK_ID INT PRIMARY KEY,
    Title VARCHAR(200),
    Author_ID INT,
    publisher VARCHAR(100),
    publication_Date DATE,
    IBSN VARCHAR(20)
    availability BOOLEAN,
    FOREIGN KEY (Author_ID) REFERENCES Authors
    (Author_ID)
        );
CREATE TABLE E-BOOKS (
    EBOOK_ID INT PRIMARY KEY,
    Title VARCHAR(200),
    Author_ID INT,
    publisher VARCHAR(100),
    publication_ Date DATE,
    ISBN VARCHAR(20)
    File_path VARCHAR(255),
    availability BOOLEAN,
    FOREIGN KEY (Author_ID) REFERENCES
    Authors (Author_ID)
        );
```

```
CREATE TABLE journals (
    journal_ID INT PRIMARY KEY,
    Title VARCHAR(200),
    Publisher VARCHAR(100),
    Publication_Date DATE,
    ISSN VARCHAR(20),
    Availability BOOLEAN);
CREATE TABLE users (
    User_ID INT PRIMARY KEY,
    Name VARCHAR(100),
    Email VARCHAR(100),
    password VARCHAR(255)
    );
    CREATE TABLE CHECKOUT_HISTORY (
        checkout_ID INT PRIMARY KEY,
        User_ID INT,
        Book_ID INT,
```

```
    EBook_ID INT,
    checkout_Date DATE
    Return_Date DATE,
    Overdue_Fine DECIMAL(10,2),
FOREIGN KEY (User_ID) REFERENCES Users(User_ID),
FOREIGN KEY (Book_ID) REFERENCES Books(Book_ID),
FOREIGN KEY (EBook_ID) REFERENCES E_Books(EBook_ID),
FOREIGN KEY (Journal_ID) REFERENCES Journals(Journal_ID)
);
CREATE TABLE Reservations (
    Reservation_ID INT PRIMARY KEY,
    User_ID INT,
    Book_ID INT,
    EBook_ID INT,
    Journal_ID, INT,
    Reservation_Date DATE,
FOREIGN KEY (User_ID) REFERENCES Users(User_ID),
FOREIGN KEY (Book_ID) REFERENCES Books(Book_ID),
FOREIGN KEY (EBook_ID) REFERENCES E_Books(EBook_ID),
FOREIGN KEY (Journal_ID) REFERENCES Journals(Journal_ID)
);
```

conclusion :

The Academic library system with Digital Resources database design successfully integrates physical and digital resource Management, providing an efficient and user-friendly platform for library operations. Finally The Academic library system with Digital Resources database design efficiently. and addresses the complex needs of modern libraries, integrating physical and digital resources.