Introduction:

The core objective of our database project is to create an accessible and intuitive library management system designed to improve the overall experience for students and the general public. The system will allow users to search and reserve books online, access digital resources like e-books and PDFs, and simplify the checkout process through a digitized ticketing system. By modernizing the library's operations, this project seeks to boost efficiency, enhance resource accessibility, and support a more streamlined library environment.

This process involves building a digital library database system that manages book reservations, checkouts, and returns using a ticket-based system. Each book and patron will have a unique ID to ensure accurate tracking and efficient documentation. When a user checks out a book, a digital ticket is created, and it remains open until the book is returned. If a user wishes to keep a book longer, they must check it out again, serving as a new type of renewal process. The system focuses on streamlining operations, improving tracking accuracy, and offering easy access to both physical and digital library resources.

Project Glossary :

- **Patron** : An individual who uses the library service and/or checks out item from the library
- **Ticketing/Ticket System** : A digital system where a new ticket is generated for each checkout; the ticket remains active until the book is returned and then gets closed.
- **Unique ID** : A uniquely distinct identification number assigned to each book and user (patron) in the system to ensure accurate tracking and management.
- **Reservation System** : This allows users to search for and reserve available books or digital resources in advance.
- **Renewal** : The process of checking out the same book again after the initial ticket is closed, instead of extending the existing ticket.
- **E-Book** : An electronic version of a printed book, accessible digitally.
- **PDFs :** Portable Document Format

Identity ER Modeling Components:

- User: Name, user_id, checked_out, role
    - Role: [child, adult, senior, student, researcher, staff, admin]
- Staff(User):
- Admin(Staff):
- Media:type, media_id, date
    - Type: [book, movie, magazine]
- DigitalMedia: digital_media_id, file_type
    - digital_media_id: int
    - file_type: [pdf, docx, txt, mp3, mp4]
- Book(Media): book_id, name, author, genre, publisher, date_published, reserved
    - book_id: int
    - name: String
    - author: String
    - genre: String
    - date_published: Dates
    - reserved: boolean
- Movie(Media): movie_id, name, genre, director, publisher, date_published, reserved
    - movie_id: int
    - name: String
    - genre: String
    - director: String
    - date_published: Dates
    - reserved: boolean
- Magazine(Media): issue_number, publication, genre, title
    - issue_number: int
    - publication: String
    - genre: String
    - title: String

Relations:

- check_out (user – media)
    - Check_out_ID
    - Check_out_Date
    - Due_Date
- returns (user – media)
- downloads(user – media)
- reserves(user – media)
- pay(user – staff)
    - fees
- manage(user – staff)
- manage(staff – admin)
- add_to(staff – media
- add_to(staff – digital_media)

The ER diagram is viewable as a .drawio file and as a pdf found in the documents/part3 folder on github