PART-A

A screen shot of a computer

Description automatically generated

PART-B

A screenshot of a computer

Description automatically generated

PART-C

A screenshot of a computer

Description automatically generated

A diagram of a book

Description automatically generated

This system consists of four entities: PATRON, BOOK, BOOK\_COPY, and CHECKOUT.

* PATRON represents a library patron and has attributes such as PATRON\_ID, NAME, ADDRESS, PHONE\_NUMBER, and EMAIL\_ADDRESS.
* BOOK represents a book in the library's collection with attributes such as AUTHOR, TITLE, PUBLICATION\_DATE, SUBJECT, and ISBN\_NUM.
* BOOK\_COPY represents a physical copy of a book with attributes such as BOOK\_ID, DATE\_OF\_PURCHASE, and ISBN\_NUM.
* CHECKOUT represents a transaction where a patron checks out a book copy and has attributes such as DATE\_OF\_CHECKOUT, PATRON\_ID, BOOK\_ID, and DUE\_DATE.

There are several relationships between these entities.

* PUBLICATION\_DATE must be older than DATE\_OF\_PURCHASE.
* No two books can have same title.
* A patron can have multiple checkouts, but each checkout is associated with only one patron.
* A book can have multiple copies, but each copy is associated with only one book.
* A book copy can be checked out only once, and each checkout is associated with only one book copy.
* Additionally, the BOOK\_ID attribute in the BOOK\_COPY entity corresponds to the One student can have only one PATRON\_ID.
* ISBN\_NUM attribute in the BOOK entity.
* Similarly, the PATRON\_ID attribute in the CHECKOUT entity corresponds to the PATRON\_ID attribute in the PATRON entity, and the BOOK\_ID attribute in the CHECKOUT entity corresponds to the BOOK\_ID attribute in the BOOK\_COPY entity.

Relationship:

Book - Author Cardinality: One-to-Many (one Author can have many Books)

Relationship: Book - Genre Cardinality: Many-to-Many

Relationship: Patron - Transaction Cardinality: One-to-Many (one Patron can have many Transactions)

Relationship: Transaction - Book Cardinality: Many-to-One (many Transactions can be associated with one Book)