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

|  |  |  |
| --- | --- | --- |
| ENTITIES | REPRESENTS | ATTRIBUTES |
| PATRON | LIBRARY PATRON | PATRON\_ID, NAME, ADDRESS, PHONE\_NUMBER, and EMAIL\_ADDRESS. |
| BOOK | REPRESENTS A BOOK IN THE LIBRARY’S COLLECTION | AUTHOR, TITLE, PUBLICATION\_DATE, SUBJECT, and ISBN\_NUM. |
| BOOK\_COPY | A PHYSICAL COPY OF A BOOK | BOOK\_ID, DATE\_OF\_PURCHASE, and ISBN\_NUM. |
| TRANSCATION | A TRANSACTION WHERE A PATRON CHECKS OUT A BOOK COPY | 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)