IT240 HW1 Part 1

1. Given the E-R diagram on the following page, list the names of the entities, attributes, keys and relationships being used.

Entities:

- Author
- Publisher
- Book
- Shopping Basket

All the entities here are strong entities

Attributes:

- ***Author:***
  1. Name (key attribute)
  2. url (multi-valued attribute)
- ***Book:***
  1. title
  2. ISBN (key attribute)
  3. Date_published
  4. year
  5. month
  6. price
- ***Publisher:***
  1. name (key attribute)
  2. Phone#
- ***Shopping Basket:***
  1. BasketID (key attribute)

Keys:

- Primary Key

Relationships:

- Strong Relationship
- Many to Many
- Many to One
- One to Many

2.For each entity, give a formal written description, including all of its attributes and its key.

1. **Book:**
   Attributes:
   1. title
   2. ISBN
   3. Date_published
   4. year
   5. month
   6. price

Key:

- ISBN

Formal Description:

The "Book" entity represents a book available in the system. Each book is described by its title, and it is uniquely identified by its ISBN (International Standard Book Number). The ISBN serves as the primary key for this entity. Additional attributes include the date when the book was published and its price.

2. Author:

   Attributes:

   - Name
   - url

   Key:

   - Name

   Formal Description:

   The "Author" entity represents an author associated with books in the system. Each author is identified by their name, which serves as the primary key for this entity. The entity also contains a multivalued attribute, URL, representing a list of URLs related to the author.

3. Publisher:

   Attributes:

   - name
   - Phone#

   Key:

   - Name

   Formal Description:

   The "Publisher" entity represents a publishing company associated with books in the system. Each publisher is identified by its name, which acts as the primary key for this entity. The entity also includes an attribute for the phone number of the publisher.

4. Shopping Basket:

   Attributes:

   - BasketID

   Key:

   - BasketID

   Formal Description:

The "Shopping Basket" entity represents a virtual basket used for online shopping. Each shopping basket is identified by a unique BasketID, which serves as the primary key for this entity. The entity does not contain any additional attributes.

3. For each relationship, give a formal written description of both directions of the relationship, including its cardinality.

Relationship between Book and Author:

Direction 1: Many books are written by many authors.
Direction 2:Many author may write many books.
Cardinality: One author (N) writes many books (M), and each book (M) is written by one author (N).

Formal Description:
In direction 1, many books are written by many authors. The Author entity's Name attribute acts as the primary key for identifying authors. In direction 2, Many authors may write many books. The primary key of the Book entity, ISBN, corresponds to a specific book written by the author.

Relationship between Book and Publisher:

Direction 1: A book is published by one publisher.
Direction 2: A publisher may publish many books.
Cardinality: One publisher (1) publishes many books (N), and each book (1) is published by one publisher (1).

Formal Description:
The "Book" entity is associated with the "Publisher" entity in a one-to-many relationship. In direction 1, each book is published by one publisher. The Publisher entity's Name attribute serves as the primary key for identifying publishers.In direction 2, a publisher may publish many books. The primary key of the Publisher entity, Name, corresponds to a specific publishing company associated with books.

Relationship between Book and Shopping Basket:

Direction 1: Many books can be added to one shopping basket.
Direction 2: A shopping basket can contain many books.
Cardinality: Many books (M) can be added to one shopping basket (1), and each shopping basket (1) can contain many books (M).

Formal Description:
In direction 1, many books can be added to one shopping basket. In direction 2, a shopping basket can contain many books. The primary key of the Shopping Basket entity, BasketID, identifies a specific shopping basket that can have multiple books associated with it.