Analyze a given business scenario and create an ER diagram that includes entities, relationships, attributes, and cardinality. Ensure that the diagram reflects proper normalization up to the third normal form.

Scenario:

A bookstore needs a database to manage their inventory, sales, and customer information. The bookstore sells books, and each book has a unique ISBN, title, author(s), genre, and price. The store also keeps track of stock quantity for each book. Customers can purchase multiple books in a single transaction, and the bookstore wants to keep a record of each sale, including the date of purchase and the total amount. The store also collects basic information about customers such as name, email, and phone number.

Entities and Attributes:

1. **Book**
   - ISBN (Primary Key)
   - Title
   - Genre
   - Price
   - Stock Quantity
2. **Author**
   - AuthorID (Primary Key)
   - Name
   - Bio
3. **Customer**
   - CustomerID (Primary Key)
   - Name
   - Email
   - Phone
4. **Sale**
   - SaleID (Primary Key)
   - SaleDate
   - TotalAmount
5. **SaleDetail** (This is a junction table for the many-to-many relationship between Sale and Book)
   - SaleID (Foreign Key, part of Primary Key)
   - ISBN (Foreign Key, part of Primary Key)
   - Quantity

Relationships:

- **Book-Author**: Many-to-Many (A book can have multiple authors, and an author can write multiple books)
- **Customer-Sale**: One-to-Many (A customer can have multiple sales, but each sale is associated with one customer)
- **Sale-Book**: Many-to-Many (A sale can include multiple books, and a book can appear in multiple sales)

Normalization:

- **First Normal Form (1NF)**: Ensure each table has a primary key and each attribute contains only atomic (indivisible) values.
- **Second Normal Form (2NF)**: Ensure 1NF is met and that non-key attributes are fully functional dependent on the primary key.
- **Third Normal Form (3NF)**: Ensure 2NF is met and that all attributes are dependent only on the primary key.

ER Diagram:

Let's describe the ER diagram with entities, attributes, relationships, and cardinality.

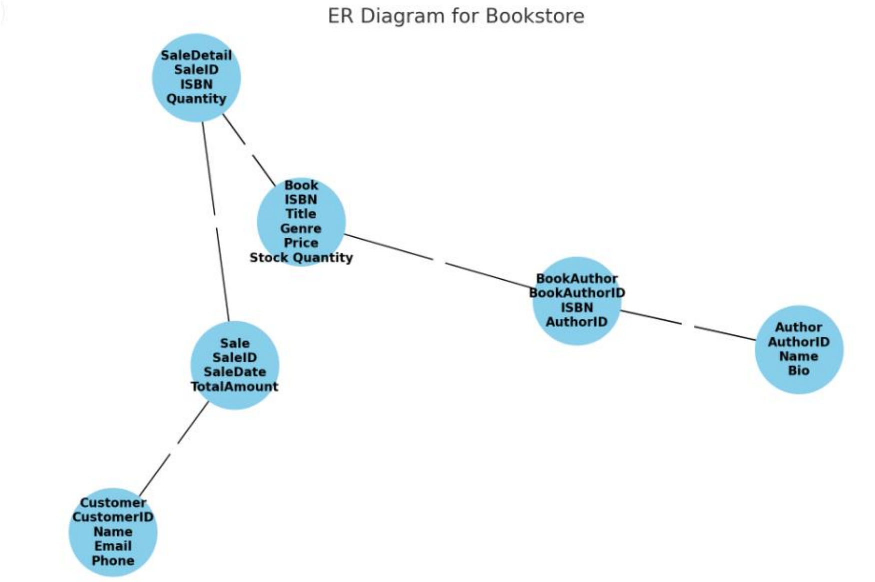
1. **Book**
    - ISBN (PK)
    - Title
    - Genre
    - Price
    - Stock Quantity
2. **Author**
    - AuthorID (PK)
    - Name
    - Bio
3. **Customer**
    - CustomerID (PK)
    - Name
    - Email
    - Phone
4. **Sale**
    - SaleID (PK)
    - SaleDate
    - TotalAmount
5. **SaleDetail**
    - SaleID (PK, FK)
    - ISBN (PK, FK)
    - Quantity

Relationships:

1. **Book-Author**: Many-to-Many
    - Create a junction table **BookAuthor**:
        - BookAuthorID (PK)
        - ISBN (FK)
        - AuthorID (FK)
2. **Customer-Sale**: One-to-Many
    - CustomerID (FK) in **Sale**
3. **Sale-Book**: Many-to-Many
    - Managed by **SaleDetail**

Cardinality:

1. **Book-Author**:
   - A book can have one or many authors.
   - An author can write one or many books.
2. **Customer-Sale**:
   - A customer can make one or many sales.
   - Each sale is made by one customer.
3. **Sale-Book**:
   - A sale can include one or many books.
   - A book can appear in one or many sales.


ER Diagram for Bookstore
SaleDetail SaleID ISBN Quantity
Book ISBN Title Genre Price Stock Quantity
BookAuthor BookAuthorID ISBN AuthorID
Author AuthorID Name Bio
Sale SaleID SaleDate TotalAmount
Customer CustomerID Name Email Phone