**Assignment 1: 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.**

**Business Scenario: A Library System**  
In this scenario, we'll design a database for a library system. The library system contains information about books, authors, borrowers, and transactions (borrowing and returning books).  
  
**Entities:**  
**Book  
Author  
Borrower  
Transaction**

**Attributes:**  
**Book:**  
  
ISBN (Primary Key)  
Title  
Genre  
Publication Year  
Publisher

**Author:**  
  
Author ID (Primary Key)  
Name  
Nationality  
Birthdate

**Borrower:**Borrower ID (Primary Key)  
Name  
Address  
Email  
Phone Number

**Transaction:**  
  
Transaction ID (Primary Key)  
Book ISBN (Foreign Key)  
Borrower ID (Foreign Key)  
Date Borrowed  
Due Date  
Date Returned  
Relationships:  
  
**Book - Author (Many-to-Many):**An author can write multiple books.  
A book can have multiple authors.  
This relationship is resolved by an intermediate table.

**Book - Transaction (One-to-Many):**  
  
A book can be involved in multiple transactions (borrowing/returning).  
A transaction involves only one book.

**Borrower - Transaction (One-to-Many):**  
  
A borrower can have multiple transactions (borrowing/returning).  
Each transaction is associated with only one borrower.

**Cardinality:**  
 **Book - Author: Many-to-Many  
Book - Transaction: One-to-Many (Each book can have multiple transactions)  
Borrower - Transaction: One-to-Many (Each borrower can have multiple transactions)  
ER Diagram:**

