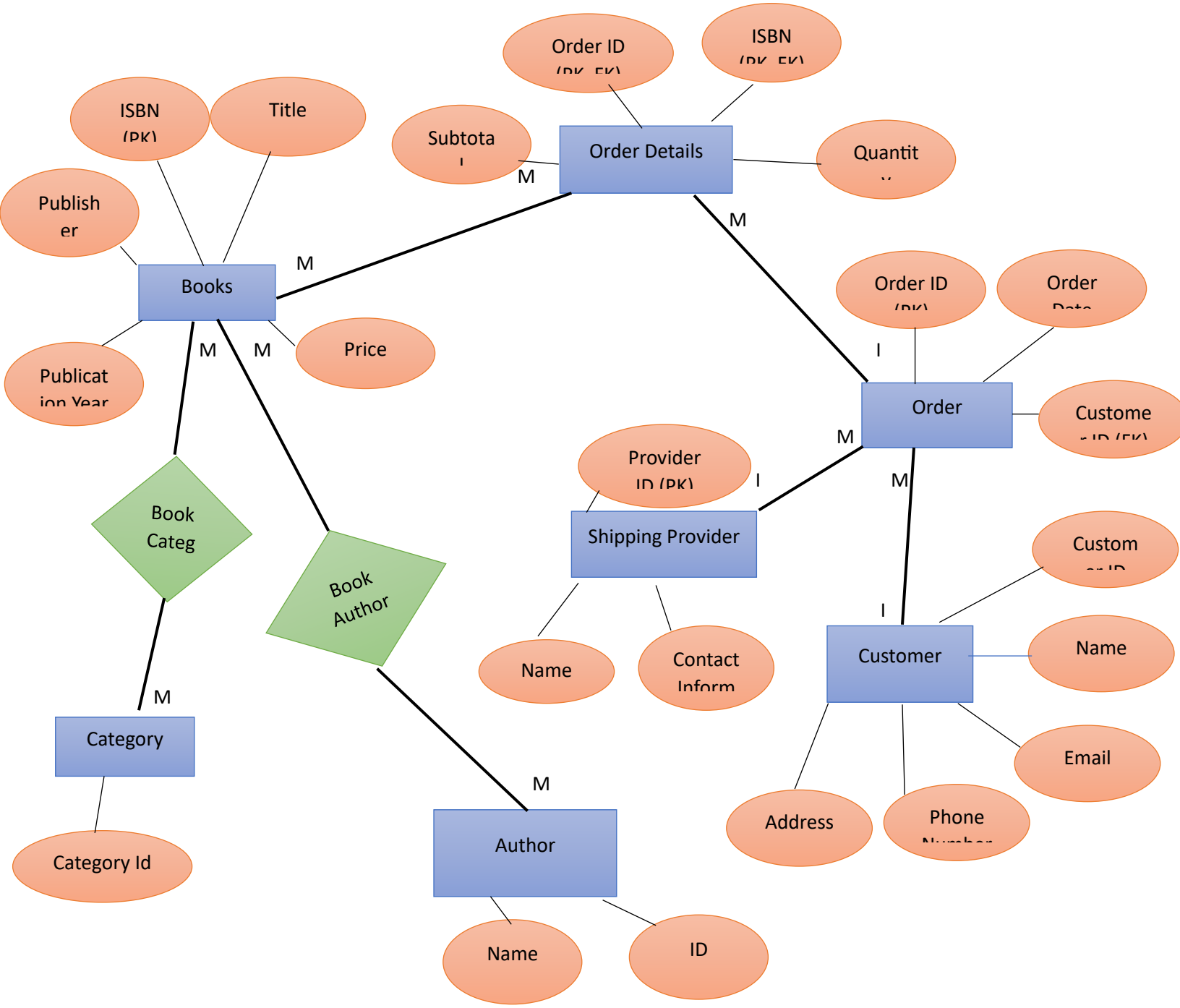
Assignment 1: Analyze a given business scenario and create an ER diagram that includes entities, relationships, attributes, and cardinality. Ensure that the diagram reflects proper normalization up to the third normal form.



Business Scenario: Online Bookstore

An online bookstore wants to manage its operations, including inventory, customer orders, and shipping. The key details are as follows:

Books:

Each book has a unique ISBN, title, author(s), publisher, publication year, and price.

Books can belong to multiple categories (e.g., Fiction, Non-fiction, Science).

Customers:

Customers have a unique customer ID, name, email, phone number, and address.

Orders:

Each order has a unique order ID, order date, and a customer who placed the order.

An order can consist of multiple books.

Each book in an order has a quantity and a subtotal (price * quantity).

Shipping:

Each order is shipped by a shipping provider.

Shipping providers have a unique provider ID, name, and contact information.

Analysis

Entities and Attributes:

Books:

- ISBN (Primary Key)
- Title

- Authors (may be split into a separate entity for normalization)
- Publisher
- Publication Year
- Price

Customers:

- Customer ID (Primary Key)
- Name
- Email
- Phone Number
- Address

Orders:

- Order ID (Primary Key)
- Order Date
- Customer ID (Foreign Key)

Order Details:

- Order ID (Composite Primary Key, Foreign Key)
- ISBN (Composite Primary Key, Foreign Key)
- Quantity
- Subtotal

Shipping Providers:

- Provider ID (Primary Key)
- Name
- Contact Information

Book Categories (Many-to-Many relationship between Books and Categories):

ISBN (Composite Primary Key, Foreign Key)

Category (Composite Primary Key)

Authors (Many-to-Many relationship between Books and Authors):

Author ID (Primary Key)

Name

Book Authors:

- ISBN (Composite Primary Key, Foreign Key)
- Author ID (Composite Primary Key, Foreign Key)

Relationships:

Books and Orders: Many-to-Many (represented by Order Details)

Books and Categories: Many-to-Many (represented by Book Categories)

Books and Authors: Many-to-Many (represented by Book Authors)

Orders and Customers: One-to-Many (a customer can place multiple orders)

Orders and Shipping Providers: One-to-Many (an order is shipped by one provider)