DATABASE MANAGEMENT AND APPLICATION

“BookMart” Online store Application Database

# Introduction

BookMart is an online bookstore that offers a wide selection of books in various genres, from classic literature to modern bestsellers. The bookstore is designed to provide a convenient and user-friendly shopping experience for customers, with features such as search and filter options, customer reviews, and recommendations. The BookMart database stores information about the books, authors, publishers, and customers, as well as their transactions. The database is designed to support the operations of the bookstore, including managing the inventory, tracking sales, and processing orders. With the BookMart database, the bookstore can provide personalized recommendations and promotions to customers, improving their shopping experience and increasing customer loyalty.

# Requirements

## Data Requirements

### Entities & Descriptions

We have several entities as follow:

#### Books:

This entity stores information about the books sold by Booknart, such as title, author, publisher, publication date, ISBN, price and stock quantity.

#### Authors:

This entity stores information about the authors of the books such as name, nationality, birth date and biography.

#### Publishers:

This entity stores information about the publishers of the books, such as name, location, and contact information.

#### Customers:

This entity stores information about the customers who purchase books from BookMart, such as name, email, phone number, and shipping address.

#### Orders:

This entity stores information about the orders placed by customers such as order number, customer ID, order date, order status and total price.

#### Order Items:

This entity stores information about the individual items included in each order such as book ID, quantity and price.

#### Reviews:

This entity stores information about the reviews submitted by the customers of books, such as book ID, Customer ID, review date and review text.

### Relationships and Cardinality

* + - 1. Books and Authors: This is a many-to-many relationship, as a book can have multiple authors and an author can write multiple books. To represent this relationship in the database, we can use an intermediate table called "BookAuthors" with foreign keys referencing the "Books" and "Authors" tables.
      2. Publishers and Books: This is a one-to-many relationship, as a book can have only one publisher but a publisher can have multiple books.
      3. Customers and Orders: This is a one-to-many relationship, as a customer can place multiple orders but each order is placed by a single customer.
      4. Orders and Order Items: This is a one-to-many relationship, as each order can have multiple items but each item belongs to a single order
      5. Customers and Reviews: This is a one-to-many relationship, as a customer can write multiple reviews but each review is written by a single customer.
      6. Books and Reviews: This is a one-to-many relationship, as a book can have multiple reviews but each review is for a single book
      7. Books and Order Items: This is a many-to-many relationship, as each order item can refer to a single book and a book can appear in multiple order items. To represent this relationship in the database, we can use another intermediate table called "BookOrderItems" with foreign keys referencing the "Books" and "Order Items" tables.

### Attributes

* + - 1. **Books Entity***:* BookID, Title, AuthorID, Publisher, PublicationDate, ISBN, Price, QuantityInStock and genres.
      2. **Authors Entity:** AuthorID, FirstName, LastName, Email, Phone, Address
      3. **Customers Entity:** CustomerID, FirstName, LastName, Email, Phone, Address
      4. **Orders Entity:**  OrderID, OrderDate, CustomerID
      5. **OrderItems:** OrderItemID, OrderID, BookID, Quantity, price
      6. **Publishers:** PublisherID, Name, Address, Phone, Email
      7. **Reviews:** ReviewID, BookID, CustomerID, ReviewDate, ReviewText, Rating

## Functional Requirements

1. The database should keep track of the availability and inventory of each book in the store.
2. It should allow for the modification, creation and deletion of records for each entity by appropriate admin.
3. Should store information about books, authors, customers, orders, publishers and reviews.
4. It shall allow addition of new authors and publishers to the system
5. It shall support creation of new orders and tracking of orders.
6. The database shall generate reports suchas best-selling authors, top-rated authors , best-selling books and total sales.
7. It must be scalable and capable of handling large volumes of data, transactions and users.
8. The system should be able to handle concurrent users and transactions, ensuring data is not corrupted or lost.
9. It must be designed in a highly normalized way to minimize data redundancy and ensure data consistency and integrity.
10. The system shall allow customers to view their order history.

## Non-Functional Requirements

1. The system shall be available 24/7 with minimal scheduled downtime for maintenance and upgrades
2. Application should operate on any OS
3. Should consume minimum hardware resources thus run-on office desktop PCs
4. The system shall be designed to ensure data consistency and reliability.
5. The system shall be designed with a user-friendly interface, intuitive navigation, and clear instructions for users.
6. The system shall be designed in a away that allow for future growth.
7. Returns can only be accessed by an admin of the system.

# Design

## Entity Relational Diagram

Figure 1 Entity relationship Diagram

## Data Dictionary

Table 1 Orders Table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Column Name | # | Type | Type Mod | Length | Not NULL |
| OrderID | 1 | Number |  | 30 | [v] |
| CustomerID | 2 | Number |  | 30 | [v] |
| OrderDate | 3 | Date |  | 10 | [ ] |
| TotalPrice | 4 | Number |  | 30 | [ ] |
| OrderStatus | 5 | Varchar2 |  | 12 | [ ] |

Table 2 Books

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Column Name | # | Type | Type Mod | Length | Not NULL |
| BooksID | 1 | Number |  | 30 | [v] |
| Title | 2 | Varchar2 |  | 50 | [v] |
| PublisherID | 3 | Number |  | 30 | [ ] |
| PublicationDate | 4 | Date |  | 10 | [ ] |
| ISBN | 5 | Varchar2 |  | 17 | [ ] |
| Price | 6 | Number(12,2) |  | 20 | [ ] |
| QuantityInStock | 7 | INT |  | 38 | [ ] |
| Genre | 8 | Varchar2 |  | 20 | [ ] |

Table 3 Customers

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Column Name | # | Type | Type Mod | Length | Not NULL |
| CustomersID | 1 | Number |  | 30 | [v] |
| FirstName | 2 | Varchar2 |  | 20 | [v] |
| LastName | 3 | Varchar2 |  | 20 | [ ] |
| Email | 4 | Varchar2 |  | 50 | [ ] |
| Phone | 5 | Varchar2 |  | 14 | [ ] |
| Address | 6 | Varchar2 |  | 300 | [ ] |

Table 4 Authors

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Column Name | # | Type | Type Mod | Length | Not NULL |
| AuthorsID | 1 | Number |  | 30 | [v] |
| FirstName | 2 | Varchar2 |  | 20 | [v] |
| LastName | 3 | Varchar2 |  | 20 | [ ] |
| Email | 4 | Varchar2 |  | 50 | [ ] |
| Phone | 5 | Varchar2 |  | 14 | [ ] |
| Address | 6 | Varchar2 |  | 300 | [ ] |

Table 5 Publisher

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Column Name | # | Type | Type Mod | Length | Not NULL |
| PublisherID | 1 | Number |  | 30 | [v] |
| Name | 2 | Varchar2 |  | 30 | [v] |
| Email | 4 | Varchar2 |  | 50 | [ ] |
| Phone | 5 | Varchar2 |  | 14 | [ ] |
| Address | 6 | Varchar2 |  | 300 | [ ] |

Table 6 Reviews

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Column Name | # | Type | Type Mod | Length | Not NULL |
| ReviewID | 1 | Number |  | 30 | [v] |
| BooksID | 2 | Number |  | 30 | [v] |
| CustomerID | 3 | Number |  | 30 | [ ] |
| ReviewDate | 4 | DATE |  | 10 | [ ] |
| Ratings | 5 | Small INT |  | 2 | [ ] |
| ReviewText | 6 | Varchar2 |  | 500 | [ ] |

Table 7 OrderItem

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Column Name | # | Type | Type Mod | Length | Not NULL |
| OrderItemID | 1 | Number |  | 30 | [v] |
| OrderID | 2 | Number |  | 30 | [v] |
| BookID | 3 | Number |  | 30 | [c ] |
| Quantity | 4 | Number |  | 10 | [ ] |

Table 8 BooksAuthor

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Column Name | # | Type | Type Mod | Length | Not NULL |
| AuthorsBookID | 1 | Number |  | 30 | [v] |
| AuthorsID | 2 | Number |  | 30 | [v] |
| BookID | 3 | Number |  | 30 | [v ] |

## Search Queries

* Select Books by certain publishers
* Filter books by genre
* Select a customer’s History
* Select the books with highest ratings
* Select the average ratings for a book
* Select all reviews for a book
* Select books with highest sales
* Select the average sales per day

# Implementation

## DDL Commands

**BOOKS TABLE**

CREATE TABLE Books (

BooksID NUMBER(30) NOT NULL,

Title VARCHAR2(50) NOT NULL,

PublisherID NUMBER(30),

PublicationDate DATE,

ISBN VARCHAR2(17),

Price NUMBER(12,2),

QuantityInStock INT,

Genre VARCHAR2(20),

PRIMARY KEY (BooksID)

);

**CUSTOMERS TABLE**

CREATE TABLE customers (

customers\_id NUMBER(30) NOT NULL,

first\_name VARCHAR2(20),

last\_name VARCHAR2(20) NOT NULL,

email VARCHAR2(50),

phone VARCHAR2(14),

address VARCHAR2(300),

PRIMARY KEY (customers\_id)

);

**AUTHORS TABLE**

CREATE TABLE Authors (

AuthorsID NUMBER(30) NOT NULL,

FirstName VARCHAR2(20) NOT NULL,

LastName VARCHAR2(20),

Email VARCHAR2(50),

Phone VARCHAR2(14),

Address VARCHAR2(300),

CONSTRAINT PK\_Authors PRIMARY KEY (AuthorsID)

);

**PUBLISHER TABLE**

CREATE TABLE Publisher (

PublisherID NUMBER(30) NOT NULL,

Name VARCHAR2(30) NOT NULL,

Email VARCHAR2(50),

Phone VARCHAR2(14),

Address VARCHAR2(300),

CONSTRAINT PK\_Publisher PRIMARY KEY (PublisherID)

);

**REVIEWS TABLE**

CREATE TABLE Reviews (

ReviewID NUMBER(30) CONSTRAINT pk\_Reviews PRIMARY KEY,

BooksID NUMBER(30) CONSTRAINT fk\_Reviews\_BooksID REFERENCES Books(BooksID),

CustomerID NUMBER(30) CONSTRAINT fk\_Reviews\_CustomerID REFERENCES Customers(Customers\_id),

ReviewDate DATE,

Ratings SMALLINT,

ReviewText VARCHAR2(500)

);

**BOOKSAUTHOR TABLE**

CREATE TABLE BooksAuthor (

AuthorsBookID NUMBER(30) NOT NULL,

AuthorsID NUMBER(30) NOT NULL,

BookID NUMBER(30) NOT NULL,

CONSTRAINT PK\_BooksAuthor PRIMARY KEY (AuthorsBookID),

CONSTRAINT FK\_BooksAuthor\_AuthorsID FOREIGN KEY (AuthorsID) REFERENCES Authors(AuthorsID),

CONSTRAINT FK\_BooksAuthor\_BookID FOREIGN KEY (BookID) REFERENCES Books(BooksID)

);

**ORDERS TABLE**

CREATE TABLE Orders (

OrderID NUMBER(30) NOT NULL,

CustomerID NUMBER(30),

OrderDate DATE,

TotalPrice NUMBER(30),

OrderStatus VARCHAR2(12),

CONSTRAINT Orders\_PK PRIMARY KEY (OrderID),

CONSTRAINT Orders\_FK1 FOREIGN KEY (CustomerID) REFERENCES Customers(Customers\_id)

);

**ORDERSITEM TABLE**

CREATE TABLE ordersitem (

OrderItemID NUMBER(30) NOT NULL,

OrderID NUMBER(30) NOT NULL,

BookID NUMBER(30) NOT NULL,

Quantity NUMBER(10),

CONSTRAINT pk\_ordersitem PRIMARY KEY (OrderItemID),

CONSTRAINT fk\_orderitem\_order FOREIGN KEY (OrderID) REFERENCES orders(OrderID),

CONSTRAINT fk\_orderitem\_book FOREIGN KEY (BookID) REFERENCES books(BooksID)

);

## DML Commands

## Insert Commands

**Books table**

INSERT INTO books (BooksID, Title, PublisherID, PublicationDate, ISBN, Price, QuantityInStock, Genre)

VALUES (1, 'The Great Gatsby', 1, TO\_DATE('01-JAN-2010', 'DD-MON-YYYY'), '978-3-16-148410-0', 9.99, 50, 'Fiction');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (2, 'To Kill a Mockingbird', 2, TO\_DATE('1960-07-11', 'YYYY-MM-DD'), '978-0446310789', 18.00, 100, 'Classic');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (3, '1984', 3, TO\_DATE('1949-06-08', 'YYYY-MM-DD'), '978-0451524935', 22.50, 75, 'Science Fiction');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (4, 'Brave New World', 4, TO\_DATE('1932-06-01', 'YYYY-MM-DD'), '978-0060850524', 19.99, 60, 'Science Fiction');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (5, 'The Catcher in the Rye', 5, TO\_DATE('1951-07-16', 'YYYY-MM-DD'), '978-0316769488', 21.00, 90, 'Classic');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (6, 'Lord of the Flies', 6, TO\_DATE('1954-09-17', 'YYYY-MM-DD'), '978-0399501487', 16.50, 70, 'Classic');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (7, 'The Hitchhiker''s Guide to the Galaxy', 7, TO\_DATE('1979-10-12', 'YYYY-MM-DD'), '978-0345391803', 15.99, 120, 'Science Fiction');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (8, 'Animal Farm', 3, TO\_DATE('1945-08-17', 'YYYY-MM-DD'), '978-0451526342', 13.25, 80, 'Classic');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (9, 'The Hobbit', 8, TO\_DATE('1937-09-21', 'YYYY-MM-DD'), '978-0547928227', 24.00, 55, 'Fantasy');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (10, 'The Lord of the Rings', 8, TO\_DATE('1954-07-29', 'YYYY-MM-DD'), '978-0547928203', 50.00, 30, 'Fantasy');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (11, 'The Catcher in the Rye', 3, TO\_DATE('07/16/1951', 'MM/DD/YYYY'), '978-0316769488', 15.99, 25, 'Fiction');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (12, 'The Great Gatsby', 2, TO\_DATE('04/10/1925', 'MM/DD/YYYY'), '978-0743273565', 12.99, 15, 'Fiction');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (13, 'The Lord of the Rings: The Fellowship of the Ring', 1, TO\_DATE('07/29/1954', 'MM/DD/YYYY'), '978-0547928210', 24.99, 10, 'Fantasy');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (14, 'To Kill a Mockingbird', 4, TO\_DATE('07/11/1960', 'MM/DD/YYYY'), '978-0446310789', 18.99, 30, 'Fiction');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (15, '1984', 3, TO\_DATE('06/08/1949', 'MM/DD/YYYY'), '978-0451524935', 14.99, 20, 'Fiction');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (16, 'Animal Farm', 3, TO\_DATE('08/17/1945', 'MM/DD/YYYY'), '978-0451526342', 12.99, 30, 'Fiction');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (17, 'The Hobbit', 1, TO\_DATE('09/21/1937', 'MM/DD/YYYY'), '978-0618260300', 19.99, 10, 'Fantasy');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (18, 'The Da Vinci Code', 5, TO\_DATE('03/18/2003', 'MM/DD/YYYY'), '978-0307474278', 21.99, 25, 'Mystery');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (19, 'Angels and Demons', 5, TO\_DATE('05/01/2000', 'MM/DD/YYYY'), '978-0743412391', 20.99, 18, 'Mystery');

INSERT INTO books (booksid, title, publisherid, publicationdate, isbn, price, quantityinstock, genre)

VALUES (20, 'The Hunger Games', 6, TO\_DATE('09/14/2008', 'MM/DD/YYYY'), '978-0439023481', 16.99, 12, 'Science Fiction');

**AUTHORS TABLE**

INSERT INTO authors (authorsid, firstname, lastname, phone, email)

VALUES (1, 'Jane', 'Austen', '555-1234', 'jane.austen@example.com');

INSERT INTO authors (authorsid, firstname, lastname, phone, email)

VALUES (2, 'Harper', 'Lee', '555-5678', 'harper.lee@example.com');

INSERT INTO authors (authorsid, firstname, lastname, phone, email)

VALUES (3, 'George', 'Orwell', '555-9012', 'george.orwell@example.com');

INSERT INTO authors (authorsid, firstname, lastname, phone, email)

VALUES (4, 'Aldous', 'Huxley', '555-3456', 'aldous.huxley@example.com');

INSERT INTO authors (authorsid, firstname, lastname, phone, email)

VALUES (5, 'J.D.', 'Salinger', '555-7890', 'jd.salinger@example.com');

INSERT INTO authors (authorsid, firstname, lastname, phone, email)

VALUES (6, 'William', 'Golding', '555-2345', 'william.golding@example.com');

INSERT INTO authors (authorsid, firstname, lastname, phone, email)

VALUES (7, 'Douglas', 'Adams', '555-6789', 'douglas.adams@example.com');

INSERT INTO authors (authorsid, firstname, lastname, phone, email)

VALUES (8, 'George', 'Orwell', '555-1234', 'george.orwell@example.com');

INSERT INTO authors (authorsid, firstname, lastname, phone, email)

VALUES (9, 'J.R.R.', 'Tolkien', '555-5678', 'jrr.tolkien@example.com');

INSERT INTO authors (authorsid, firstname, lastname, phone, email)

VALUES (10, 'J.R.R.', 'Tolkien', '555-9012', 'jrr.tolkien@example.com');

INSERT INTO authors (authorsid, firstname, lastname, email, phone)

VALUES (11, 'Sylvia', 'Plath', 'sylvia.plath@example.com', '+1-555-555-11');

INSERT INTO authors (authorsid, firstname, lastname, email, phone)

VALUES (12, 'Ernest', 'Hemingway', 'ernest.hemingway@example.com', '+1-555-555-22');

INSERT INTO authors (authorsid, firstname, lastname, email, phone)

VALUES (13, 'Virginia', 'Woolf', 'virginia.woolf@example.com', '+1-555-555-33');

INSERT INTO authors (authorsid, firstname, lastname, email, phone)

VALUES (14, 'Aldous', 'Huxley', 'aldous.huxley@example.com', '+1-555-555-44');

INSERT INTO authors (authorsid, firstname, lastname, email, phone)

VALUES (15, 'F. Scott', 'Fitzgerald', 'f.scott.fitzgerald@example.com', '+1-555-555-55');

INSERT INTO authors (authorsid, firstname, lastname, email, phone)

VALUES (16, 'Albert', 'Camus', 'albert.camus@example.com', '+1-555-555-66');

INSERT INTO authors (authorsid, firstname, lastname, email, phone)

VALUES (17, 'George', 'Orwell', 'george.orwell@example.com', '+1-555-555-77');

INSERT INTO authors (authorsid, firstname, lastname, email, phone)

VALUES (18, 'J.R.R.', 'Tolkien', 'jrr.tolkien@example.com', '+1-555-555-88');

INSERT INTO authors (authorsid, firstname, lastname, email, phone)

VALUES (19, 'Jack', 'Kerouac', 'jack.kerouac@example.com', '+1-555-555-99');

INSERT INTO authors (authorsid, firstname, lastname, email, phone)

VALUES (20, 'Ken', 'Kesey', 'ken.kesey@example.com', '+1-555-555-00');

**BOOKSAUTHOR TABLE**

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(1, 1, 1);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(2, 2, 2);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(3, 3, 3);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(4, 4, 4);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(5, 5, 5);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(6, 6, 6);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(7, 7, 7);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(8, 3, 8);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(9, 9, 9);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(10, 9, 10);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(11, 2, 1);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(12, 1, 2);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(13, 1, 3);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(14, 3, 4);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(15, 4, 5);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(16, 5, 6);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(17, 6, 7);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(18, 2, 8);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(19, 8, 9);

INSERT INTO booksauthor (authorsbookID, AuthorsID, bookID)

VALUES

(20, 7, 10);

**PUBLISHERS TABLE**

INSERT INTO publisher (publisherid, name, phone, email, address)

VALUES (1, 'Penguin Random House', '555-1234', 'info@penguinrandomhouse.com', '123 Main St, New York, NY');

INSERT INTO publisher (publisherid, name, phone, email, address)

VALUES (2, 'HarperCollins Publishers', '555-5678', 'info@harpercollins.com', '456 Broadway, San Francisco, CA');

INSERT INTO publisher (publisherid, name, phone, email, address)

VALUES (3, 'Hachette Livre', '555-9101', 'info@hachette.com', '789 Fifth Ave, Los Angeles, CA');

INSERT INTO publisher (publisherid, name, phone, email, address)

VALUES (4, 'Simon 1', '555-1212', 'info@simonandschuster.com', '321 Elm St, Chicago, IL');

INSERT INTO publisher (publisherid, name, phone, email, address)

VALUES (5, 'Macmillan Publishers', '555-1313', 'info@macmillan.com', '543 Oak St, Boston, MA');

INSERT INTO publisher (publisherid, name, phone, email, address)

VALUES (6, 'Bloomsbury Publishing', '555-1414', 'info@bloomsbury.com', '876 Maple Ave, Seattle, WA');

INSERT INTO publisher (publisherid, name, phone, email, address)

VALUES (7, 'Random House', '555-1515', 'info@randomhouse.com', '234 Cedar St, Miami, FL');

INSERT INTO publisher (publisherid, name, phone, email, address)

VALUES (8, 'Houghton Mifflin Harcourt', '555-1616', 'info@hmhco.com', '567 Pine St, Denver, CO');

INSERT INTO publisher (publisherid, name, phone, email, address)

VALUES (9, 'Scholastic Corporation', '555-1717', 'info@scholastic.com', '890 Walnut St, Houston, TX');

INSERT INTO publisher (publisherid, name, phone, email, address)

VALUES (10, 'Wiley-Blackwell', '555-1818', 'info@wiley.com', '123 Oak St, Atlanta, GA');

INSERT INTO publisher (publisherid, name, phone, email, address)

VALUES (11, 'Oxford University Press', '555-1919', 'info@oup.com', '456 Maple St, Portland, OR');

INSERT INTO publisher (publisherid, name, phone, email, address)

VALUES (12, 'Elsevier', '555-2020', 'info@elsevier.com', '789 Pine St, Dallas, TX');

INSERT INTO publisher (publisherid, name, phone, email, address)

VALUES (13, 'Springer Nature', '555-2121', 'info@springernature.com', '543 Elm St, Washington, D.C.');

INSERT INTO publisher (publisherid, name, phone, email, address)

VALUES (14, 'Taylor frank', '555-2222', 'info@taylorfrancis.com', '876 Oak St, Phoenix, AZ');

INSERT INTO publisher (publisherid, name, phone, email, address)

VALUES (15, 'Cambridge University Press', '555-2323', 'info@cambridge.org', '234 Cedar St, Minneapolis, MN');

**CUSTOMERS TABLE**

INSERT INTO customers (customers\_id, first\_name, last\_name, email, phone, address)

VALUES (1, 'John', 'Doe', 'johndoe@example.com', '123-456-7890', '123 Main St');

INSERT INTO customers (customers\_id, first\_name, last\_name, email, phone, address)

VALUES (2, 'Jane', 'Smith', 'janesmith@example.com', '555-555-5555', '456 Oak Ave');

INSERT INTO customers (customers\_id, first\_name, last\_name, email, phone, address)

VALUES (3, 'Mike', 'Johnson', 'mikejohnson@example.com', '111-222-3333', '789 Elm St');

INSERT INTO customers (customers\_id, first\_name, last\_name, email, phone, address)

VALUES (4, 'Sara', 'Lee', 'saralee@example.com', '444-444-4444', '456 Pine St');

INSERT INTO customers (customers\_id, first\_name, last\_name, email, phone, address)

VALUES (5, 'David', 'Williams', 'davidwilliams@example.com', '555-666-7777', '789 Maple Ave');

INSERT INTO customers (customers\_id, first\_name, last\_name, email, phone, address)

VALUES (6, 'Jessica', 'Davis', 'jessicadavis@example.com', '888-888-8888', '123 Oak St');

INSERT INTO customers (customers\_id, first\_name, last\_name, email, phone, address)

VALUES (7, 'Chris', 'Brown', 'chrisbrown@example.com', '333-444-5555', '456 Maple St');

INSERT INTO customers (customers\_id, first\_name, last\_name, email, phone, address)

VALUES (8, 'Lisa', 'Kim', 'lisakim@example.com', '777-777-7777', '789 Cherry Ave');

INSERT INTO customers (customers\_id, first\_name, last\_name, email, phone, address)

VALUES (9, 'Tom', 'Smith', 'tomsmith@example.com', '222-222-2222', '123 Elm St');

INSERT INTO customers (customers\_id, first\_name, last\_name, email, phone, address)

VALUES (10, 'Emily', 'Wilson', 'emilywilson@example.com', '999-999-9999', '456 Cherry St');

INSERT INTO customers (CUSTOMERS\_ID, FIRST\_NAME, LAST\_NAME, EMAIL, PHONE, ADDRESS)

VALUES (11, 'Lucas', 'Garcia', 'lucasgarcia@gmail.com', '555-1234', '123 Main St');

INSERT INTO customers (CUSTOMERS\_ID, FIRST\_NAME, LAST\_NAME, EMAIL, PHONE, ADDRESS)

VALUES (12, 'Sophie', 'Davis', 'sophiedavis@gmail.com', '555-5678', '456 Elm St');

INSERT INTO customers (CUSTOMERS\_ID, FIRST\_NAME, LAST\_NAME, EMAIL, PHONE, ADDRESS)

VALUES (13, 'David', 'Brown', 'davidbrown@yahoo.com', '555-3456', '789 Oak St');

INSERT INTO customers (CUSTOMERS\_ID, FIRST\_NAME, LAST\_NAME, EMAIL, PHONE, ADDRESS)

VALUES (14, 'Ava', 'Robinson', 'avarobinson@hotmail.com', '555-7890', '567 Pine St');

INSERT INTO customers (CUSTOMERS\_ID, FIRST\_NAME, LAST\_NAME, EMAIL, PHONE, ADDRESS)

VALUES (15, 'Gabriel', 'Flores', 'gabrielflores@gmail.com', '555-2345', '234 Maple St');

INSERT INTO customers (CUSTOMERS\_ID, FIRST\_NAME, LAST\_NAME, EMAIL, PHONE, ADDRESS)

VALUES (16, 'Nora', 'Baker', 'norabaker@yahoo.com', '555-6789', '345 Cedar St');

INSERT INTO customers (CUSTOMERS\_ID, FIRST\_NAME, LAST\_NAME, EMAIL, PHONE, ADDRESS)

VALUES (17, 'Ethan', 'Reed', 'ethanreed@hotmail.com', '555-4567', '789 Walnut St');

INSERT INTO customers (CUSTOMERS\_ID, FIRST\_NAME, LAST\_NAME, EMAIL, PHONE, ADDRESS)

VALUES (18, 'Charlotte', 'Lee', 'charlottelee@gmail.com', '555-8901', '890 Birch St');

INSERT INTO customers (CUSTOMERS\_ID, FIRST\_NAME, LAST\_NAME, EMAIL, PHONE, ADDRESS)

VALUES (19, 'Daniel', 'Wright', 'danielwright@yahoo.com', '555-3210', '123 Cedar St');

INSERT INTO customers (CUSTOMERS\_ID, FIRST\_NAME, LAST\_NAME, EMAIL, PHONE, ADDRESS)

VALUES (20, 'Isabella', 'Carter', 'isabellacarter@hotmail.com', '555-7654', '456 Oak St');

**REVIEWS TABLE**

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (1, 1, 1, TO\_DATE('2023-05-05','YYYY-MM-DD'), 4, 'Great book, highly recommended!');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (2, 2, 2, TO\_DATE('2023-05-04', 'YYYY-MM-DD'), 3, 'It was a decent read, but not my favorite.');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (3, 3, 3, TO\_DATE('2023-05-03', 'YYYY-MM-DD'), 5, 'This book was amazing! Couldnt put it down.');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (4, 4, 4, TO\_DATE('2023-05-02', 'YYYY-MM-DD'), 2, 'I didn''t enjoy this book at all.');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (5, 5, 5, TO\_DATE('2023-05-01', 'YYYY-MM-DD'), 4, 'I loved this book, the characters were so well-developed.');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (6, 6, 6, TO\_DATE('2023-04-30', 'YYYY-MM-DD'), 5, 'I couldn''t put this book down, it was so engaging.');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (7, 7, 7, TO\_DATE('2023-04-29', 'YYYY-MM-DD'), 3, 'It was an okay read, but nothing special.');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (8, 8, 8, TO\_DATE('2023-04-28', 'YYYY-MM-DD'), 4, 'This book was really good, I would recommend it to others.');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (9, 9, 9, TO\_DATE('2023-04-27', 'YYYY-MM-DD'), 5, 'I absolutely loved this book, it was so well-written.');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (10, 10, 10, TO\_DATE('2023-04-26', 'YYYY-MM-DD'), 3, 'It was an okay book, but not my favorite.');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (11, 1, 2, TO\_DATE('2023-04-25','YYYY-MM-DD'), 5, 'This book was absolutely fantastic! I loved the way the plot unfolded. ');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (12, 2, 3, TO\_DATE('2023-04-24', 'YYYY-MM-DD'), 2, 'I didn''t really like this book. The characters felt one-dimensional.');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (13, 3, 4, TO\_DATE('2023-04-23', 'YYYY-MM-DD'), 4, 'I enjoyed this book overall, but there were a few slow parts.');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (14, 4, 5, TO\_DATE('2023-04-22', 'YYYY-MM-DD'), 3, 'It was an okay book, but I found the writing style a bit dry.');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (15, 5, 6, TO\_DATE('2023-04-21', 'YYYY-MM-DD'), 5, 'This book was amazing! The author really knows how to craft a story.');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (16, 6, 7, TO\_DATE('2023-04-20', 'YYYY-MM-DD'), 4, 'I enjoyed this book overall, but I didn''t love the ending.');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (17, 7, 8, TO\_DATE('2023-04-19', 'YYYY-MM-DD'), 5, 'I loved this book! The characters were so well-developed.');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (18, 8, 9, TO\_DATE('2023-04-18', 'YYYY-MM-DD'), 3, 'It was an okay book, but not one of my favorites.');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (19, 9, 10, TO\_DATE('2023-04-17', 'YYYY-MM-DD'), 5, 'This book was amazing! I couldn''t put it down.');

INSERT INTO reviews (reviewid, booksid, customerid, reviewdate, ratings, reviewtext)

VALUES (20, 10, 1, TO\_DATE('2023-04-16', 'YYYY-MM-DD'), 4, 'I really enjoyed this book, especially the twist ending!');

**ORDERS TABLE**

INSERT INTO orders (orderid, customerid, orderdate, totalprice, orderstatus)

VALUES (1, 1, to\_date('2022-01-01', 'yyyy-mm-dd'), 50.00, 'pending');

INSERT INTO orders (orderid, customerid, orderdate, totalprice, orderstatus)

VALUES (2, 2, to\_date('2022-02-15', 'yyyy-mm-dd'), 60.00, 'shipped');

INSERT INTO orders (orderid, customerid, orderdate, totalprice, orderstatus)

VALUES (3, 3, to\_date('2022-03-10', 'yyyy-mm-dd'), 25.00, 'pending');

INSERT INTO orders (orderid, customerid, orderdate, totalprice, orderstatus)

VALUES (4, 4, to\_date('2022-04-05', 'yyyy-mm-dd'), 45.00, 'cancelled');

INSERT INTO orders (orderid, customerid, orderdate, totalprice, orderstatus)

VALUES (5, 5, to\_date('2022-05-20', 'yyyy-mm-dd'), 100.00, 'shipped');

INSERT INTO orders (orderid, customerid, orderdate, totalprice, orderstatus)

VALUES (6, 6, to\_date('2022-06-12', 'yyyy-mm-dd'), 75.00, 'pending');

INSERT INTO orders (orderid, customerid, orderdate, totalprice, orderstatus)

VALUES (7, 7, to\_date('2022-07-01', 'yyyy-mm-dd'), 30.00, 'shipped');

INSERT INTO orders (orderid, customerid, orderdate, totalprice, orderstatus)

VALUES (8, 8, to\_date('2022-08-25', 'yyyy-mm-dd'), 90.00, 'pending');

INSERT INTO orders (orderid, customerid, orderdate, totalprice, orderstatus)

VALUES (9, 9, to\_date('2022-09-16', 'yyyy-mm-dd'), 55.00, 'shipped');

INSERT INTO orders (orderid, customerid, orderdate, totalprice, orderstatus)

VALUES (10, 10, to\_date('2022-10-30', 'yyyy-mm-dd'), 80.00, 'pending');

INSERT INTO orders (orderid, customerid, orderdate, totalprice, orderstatus)

VALUES (11, 8, TO\_DATE('2022-02-15', 'YYYY-MM-DD'), 28.99, 'Processing');

INSERT INTO orders (orderid, customerid, orderdate, totalprice, orderstatus)

VALUES (12, 9, TO\_DATE('2022-03-01', 'YYYY-MM-DD'), 45.99, 'Delivered');

INSERT INTO orders (orderid, customerid, orderdate, totalprice, orderstatus)

VALUES (13, 10, TO\_DATE('2022-03-10', 'YYYY-MM-DD'), 19.99, 'Shipped');

INSERT INTO orders (orderid, customerid, orderdate, totalprice, orderstatus)

VALUES (14, 1, TO\_DATE('2022-04-01', 'YYYY-MM-DD'), 12.99, 'Cancelled');

INSERT INTO orders (orderid, customerid, orderdate, totalprice, orderstatus)

VALUES (15, 5, TO\_DATE('2022-04-15', 'YYYY-MM-DD'), 32.99, 'Processing');

**ORDERSITEM TABLE**

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (1, 1, 1, 2);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (2, 1, 2, 1);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (3, 2, 3, 3);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (4, 2, 4, 1);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (5, 3, 5, 2);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (6, 4, 6, 1);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (7, 4, 7, 2);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (8, 5, 8, 3);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (9, 5, 9, 1);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (10, 5, 10, 2);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (11, 4, 6, 1);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (12, 4, 7, 1);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (13, 5, 8, 2);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (14, 5, 9, 1);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (15, 6, 10, 1);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (16, 6, 1, 1);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (17, 7, 2, 1);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (18, 7, 3, 1);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (19, 8, 4, 2);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (20, 8, 5, 1);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (21, 4, 5, 2);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (22, 5, 8, 1);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (23, 6, 10, 3);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (24, 7, 1, 1);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (25, 8, 3, 2);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (26, 9, 6, 1);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (27, 10, 9, 1);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (28, 11, 2, 2);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (29, 12, 4, 3);

INSERT INTO ordersitem (orderitemid, orderid, bookid, quantity)

VALUES (30, 13, 7, 1);

INSERT INTO ordersitem (ORDERITEMID, ORDERID, BOOKID, QUANTITY)

VALUES (31, 9, 8, 2);

INSERT INTO ordersitem (ORDERITEMID, ORDERID, BOOKID, QUANTITY)

VALUES (32, 9, 9, 1);

INSERT INTO ordersitem (ORDERITEMID, ORDERID, BOOKID, QUANTITY)

VALUES (33, 10, 4, 1);

INSERT INTO ordersitem (ORDERITEMID, ORDERID, BOOKID, QUANTITY)

VALUES (34, 10, 10, 3);

INSERT INTO ordersitem (ORDERITEMID, ORDERID, BOOKID, QUANTITY)

VALUES (35, 11, 1, 2);

INSERT INTO ordersitem (ORDERITEMID, ORDERID, BOOKID, QUANTITY)

VALUES (36, 11, 6, 1);

INSERT INTO ordersitem (ORDERITEMID, ORDERID, BOOKID, QUANTITY)

VALUES (37, 12, 7, 1);

INSERT INTO ordersitem (ORDERITEMID, ORDERID, BOOKID, QUANTITY)

VALUES (38, 12, 8, 1);

INSERT INTO ordersitem (ORDERITEMID, ORDERID, BOOKID, QUANTITY)

VALUES (39, 13, 3, 1);

INSERT INTO ordersitem (ORDERITEMID, ORDERID, BOOKID, QUANTITY)

VALUES (40, 13, 5, 2);

## Queries

* Select Books by certain publishers e.g “Macmillan Publishers”

SELECT b.\*, p.name

FROM books b

INNER JOIN publisher p

ON b.publisherid = p.publisherid

WHERE p.name = 'Macmillan Publishers';

* Filter books by genre

SELECT \* FROM books WHERE genre = 'Science Fiction';

* Select a customer’s History e.g customer with id 10

SELECT o.\*,oi.\*,c.first\_name,c.last\_name

FROM orders o

JOIN ordersitem oi ON o.orderid = oi.orderid

join customers c ON c.customers\_id = o.customerid

WHERE o.customerid = 10;

* Select the books with highest ratings

SELECT b.title, f.avg\_ratings

FROM books b

JOIN (

SELECT AVG(ratings) AS avg\_ratings, BooksID

FROM reviews

GROUP BY BooksID

) f ON b.Booksid = f.BooksID

order by AVG\_Ratings DESC

FETCH FIRST 5 ROWS ONLY;

* Select the average ratings for a book e.g book with id = 3

­­­ Select b.\*,AVerage\_rating from

books b join

(

SELECT AVG(Ratings) AS Average\_Rating, booksID

FROM Reviews r

GROUP BY r.BooksID

) s on s.booksid = b.booksid

WHERE b.BooksID = 3

* Select all reviews for a book

Select b.title, r.customerID as customer, r.ratings, r.reviewtext from

reviews r join

books b on b.booksid = r.booksid

where b.booksid = 5;

* Select books with highest sales

SELECT b.Title, SUM(oi.Quantity) AS TotalSales

FROM books b

JOIN ordersitem oi ON b.Booksid = oi.Bookid

JOIN orders o ON o.Orderid = oi.Orderid

GROUP BY b.Title

ORDER BY TotalSales DESC;

* **Select the average sales per day**

SELECT SUM(totalprice) / (MAX(orderdate) - MIN(orderdate) + 1) AS average\_sales\_per\_day

FROM orders;

## Triggers and Procedures

### 4.4.1 Triggers

Create a procedure to retrieve order details for a customer.

CREATE OR REPLACE PROCEDURE GetCustomerOrders (customerId IN NUMBER) AS

BEGIN

SELECT \* FROM orders WHERE customerId = GetCustomerOrders.customerId;

END;

Create another procedure to retrieve the total sales for a particular book based on bookID

CREATE OR REPLACE PROCEDURE get\_book\_sales(book\_id IN NUMBER, total\_sales OUT NUMBER)

AS

BEGIN

SELECT SUM(oi.quantity \* b.price)

INTO total\_sales

FROM ordersItem oi

JOIN books b ON oi.Booksid = b.Booksid

WHERE oi.Booksid = book\_id;

END;

### 4.4.2 Triggers

Create a trigger that would update the quantity in the books table.

CREATE OR REPLACE TRIGGER Updatequantity AFTER INSERT ON ordersitem

FOR EACH ROW

BEGIN

UPDATE books

SET quantity = quantity - :NEW.quantity

WHERE books id = :NEW.bookId;

END;