

Online Bookstore Inventory Management System

Introduction

The **Online Bookstore Inventory Management System** is a digital platform developed to automate and manage various tasks related to running an online bookstore. This system ensures smooth operation by organizing data and processes efficiently.

The system ensures:

- Efficient book and stock management
- Order processing and customer tracking
- Categorization of books
- Admin activity tracking

Key Functions of the System:

- **Book Management**
 - Add, update, and remove book listings
 - Track book details like title, author, genre, price, and stock
- **Category Management**
 - Organize books into categories (e.g., fiction, academic, self-help)
 - Allow admins to create and manage categories easily
- **Customer Management**
 - Store customer information (name, contact, address, registration date)
 - Maintain a record of returning and new customers
- **Order and Purchase Management**
 - Customers can place orders for one or more books
 - System calculates total amount, tracks payment and delivery status
- **Inventory Tracking**

- Automatically update stock levels after each order
- Prevent overselling and notify low-stock items
- **Admin Controls**
 - Admins can manage books, categories, and view overall system activities
 - Secure control over who can create or modify entries
- **Customer Reviews & Ratings**
 - Customers can give feedback and rate books
 - Helps other buyers in decision-making and improves service

System Benefits:

- Reduces manual work and paperwork
- Minimizes human errors in orders and inventory
- Provides real-time access to data (books, orders, customers)
- Improves customer experience with a smooth and organized process
- Easy to use, even for users with basic technical skills

Tables and Entities:

It includes 7 main tables: Admins, Categories, Books, Customers, Orders, Order_Items, and Reviews. Each table handles specific tasks such as book records, customer data, orders, and feedback.

1. Admins

admin_id, name, email, phone, role, created_at

Primary Key: admin_id

Foreign Key: None

2. Categories

category_id, name, description, created_by, created_at, status

Primary Key: category_id

Foreign Key: created_by → Admins(admin_id)

3. Books

Book_id, Title, Author, Genre, Price, Stock, Category_id

Primary Key: Book_id

Foreign Key: Category_id → Categories(Category_id)

4. Customers

customer_id, name, email, phone, address, registration_date

Primary Key: customer_id

Foreign Key: none

5. Orders

order_id, customer_id, order_date, total_amount, payment_status, delivery_status

Primary Key: order_id

Foreign Key: customer_id → Customers(customer_id)

6. Order_Items

item_id, order_id, book_id, quantity, price, subtotal

Primary Key: item_id

Foreign Keys: order_id → Orders(order_id)

: book_id → Books(book_id)

7. Reviews

review_id, book_id, customer_id, rating, comment, review_date

Primary Key: review_id

Foreign Keys: book_id → Books(book_id)

: customer_id → Customers(customer_id)

Relationships Among Tables:

1. Customers — Places —> Orders

Cardinality: Customer (M) — (M) Order

2. Order_Items — Contains —> Books

Cardinality: Order_Items (M) — (M) Books

3. Customer — Writes —> Review

Cardinality: Customer (1) — (M) Review

4. Reviews — Of —> Books

Cardinality: Book (M) — (M) Review

5. Admins — Create —> Category

Cardinality: Admin (1) — (M) Category

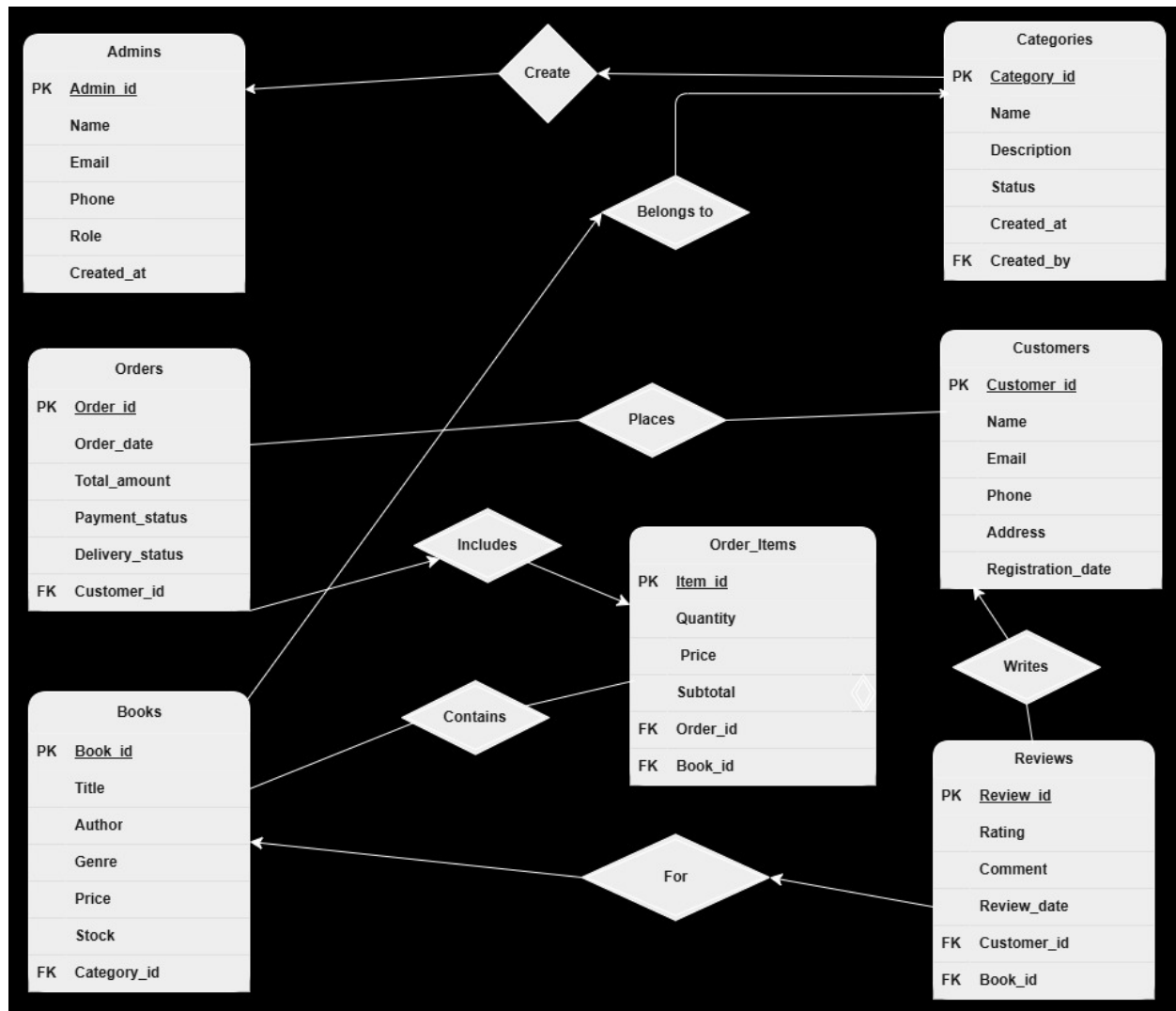
6. Books — Belong_to —> Category

Cardinality: Category (1) — (M) Books

7. Orders — Include —> Order_Items

Cardinality: Orders (M) — (M) Order_Items

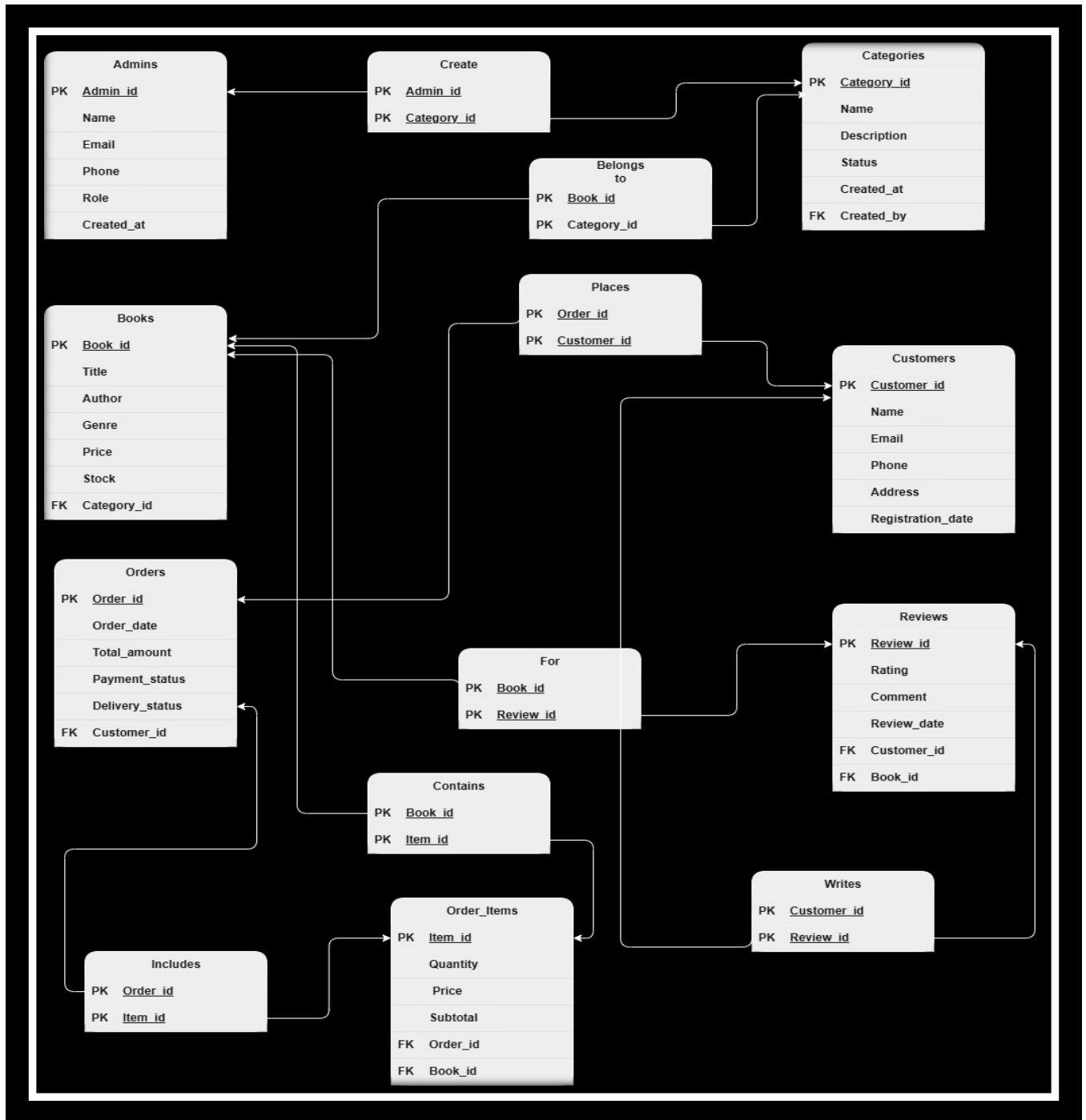
ER Diagram:



For clear understanding:

- 1) <https://app.diagrams.net/#G1qXH6PQWHstDJHyRWhLUKhIL9g9o5K2x1#%7B%22pageId%22%3A%22bPgeqzEszBXqpjA1GqrR%22%7D>
- 2) https://drive.google.com/file/d/1qXH6PQWHstDJHyRWhLUKhIL9g9o5K2x1/view?usp=drive_link

Schema Diagram:



Queries:

- 1) (Display all columns and all records from the Books table.)

```
SELECT * FROM Books
```

Book_id	Title	Author	Genre	Price	Stock	Category_id
1	The Alchemist	Paulo Coelho	Fiction	12.99	20	1
2	Atomic Habits	James Clear	Self-help	15.50	15	2
3	1984	George Orwell	Dystopian	11.00	25	3
4	To Kill a Mockingbird	Harper Lee	Classic	10.99	30	4
5	The Subtle Art...	Mark Manson	Self-help	13.75	18	2
6	Sapiens	Yuval Noah Harari	History	17.80	22	5
7	Think and Grow Rich	Napoleon Hill	Self-help	14.00	16	2
8	Rich Dad Poor Dad	Robert Kiyosaki	Finance	9.99	27	6
9	Crime and Punishment	Fyodor Dostoevsky	Classic	13.49	12	3
10	The Book Thief	Markus Zusak	History	12.30	21	5
11	The Power of Habit	Charles Duhigg	Self-help	14.25	19	2
12	Digital Fortress	Dan Brown	Thriller	11.75	20	7
13	The Da Vinci Code	Dan Brown	Thriller	12.50	14	7
14	Inferno	Dan Brown	Thriller	13.25	23	7
15	The Kite Runner	Khaled Hosseini	Drama	12.99	18	8
16	A Thousand Splendid Suns	Khaled Hosseini	Drama	13.45	17	8
17	The Girl on the Train	Paula Hawkins	Mystery	11.60	26	9
18	Educated	Tara Westover	Memoir	10.95	15	10

- 2) (Display all columns and all records from the Customers table.)

```
SELECT * FROM Customers
```

customer_id	name	email	phone	address	registration_date
1	Ayesha Khan	ayesha@mail.com	01711112222	Dhaka	10-01-2024
2	Mehedi Hasan	mehedi@mail.com	01712345678	Chittagong	12-01-2024
3	Tania Rahman	tania@mail.com	01811113333	Sylhet	01-02-2024
4	Junaid Alam	junaid@mail.com	01719876543	Dhaka	05-02-2024
5	Nusrat Jahan	nusrat@mail.com	01688889999	Khulna	10-02-2024
6	Arif Hossain	arif@mail.com	01923456789	Rajshahi	15-02-2024
7	Farhana Noor	farhana@mail.com	01745678901	Comilla	18-02-2024
8	Tamim Iqbal	tamim@mail.com	01899990000	Barisal	01-03-2024
9	Jannat Ara	jannat@mail.com	01911112222	Rangpur	05-03-2024
10	Sakib Ali	sakib@mail.com	01776543210	Mymensingh	08-03-2024
11	Salma Akter	salma@mail.com	01711223344	Sylhet	11-03-2024
12	Shuvo Rahman	shuvo@mail.com	01812344321	Bogura	15-03-2024
13	Lamia Haque	lamia@mail.com	01987654321	Dhaka	17-03-2024
14	Munna Hossain	munna@mail.com	01799887766	Chandpur	20-03-2024
15	Rifat Karim	rifat@mail.com	01845678912	Kushtia	25-03-2024
16	Shamima Nasrin	shamima@mail.com	01722334455	Noakhali	28-03-2024
17	Saif Ahmed	saif@mail.com	01833221100	Cox's Bazar	01-04-2024
18	Nadia Islam	nadia@mail.com	01955667788	Dhaka	05-04-2024

3) (Display all columns and all records from the Orders table.)

SELECT * FROM Orders

order_id	customer_id	order_date	total_amount	payment_status	delivery_status
1	1	2024-04-10	25.98	Paid	Delivered
2	2	2024-04-11	15.50	Unpaid	Pending
3	3	2024-04-11	22.00	Paid	Shipped
4	4	2024-04-12	10.99	Paid	Delivered
5	5	2024-04-13	13.75	Paid	Processing
6	6	2024-04-14	17.80	Unpaid	Cancelled
7	7	2024-04-14	28.00	Paid	Delivered
8	8	2024-04-15	26.49	Paid	Delivered
9	9	2024-04-16	36.75	Paid	Pending
10	10	2024-04-16	13.25	Paid	Delivered
11	11	2024-04-17	12.99	Unpaid	Pending
12	12	2024-04-17	25.94	Paid	Shipped
13	13	2024-04-18	24.55	Paid	Delivered
14	14	2024-04-18	27.50	Paid	Delivered
15	15	2024-04-19	29.95	Unpaid	Processing
16	16	2024-04-19	14.00	Paid	Delivered
17	17	2024-04-20	31.80	Paid	Shipped
18	18	2024-04-21	15.45	Paid	Delivered

4) (Display all columns and all records from the Categories table.)

SELECT * FROM Categories

category_id	name	description	created_by	created_at	status
1	Fiction	Stories that are imaginative and not real.	1	29-04-2025	Active
2	Self-help	Books that guide personal development.	3	29-04-2025	Active
3	Dystopian	Fictional society in decline or oppression.	1	15-04-2025	Active
4	Classic	Timeless literary works.	2	29-04-2025	Active
5	History	Books based on historical events.	1	18-03-2025	Active
6	Finance	Books about managing money.	1	29-04-2025	Active
7	Thriller	Books full of suspense and excitement.	6	29-04-2025	Stock Out
8	Drama	Emotional and realistic storytelling.	1	10-04-2025	Active
9	Mystery	Books about solving crimes or puzzles.	9	10-04-2025	Active
10	Memoir	Personal life stories.	2	12-03-2025	Active
11	Biography	Books about famous people.	1	14-04-2025	Active
12	Science	Books exploring scientific topics.	1	22-03-2025	Active
13	Religion	Books about religious beliefs.	4	29-04-2025	Active
14	Politics	Books related to political theory or history.	1	29-04-2025	Active
15	Poetry	Books of poems.	8	23-04-2025	Active
16	Philosophy	Books on thinking and wisdom.	7	20-03-2025	Active
17	Technology	Books on modern tech trends.	1	29-04-2025	Active
18	Romance	Love and relationship stories.	6	29-04-2025	Active

5) (Display all columns and all records from the Admins table.)

SELECT * FROM Admins

admin_id	name	email	phone	role	created_at
1	admin1	admin1@gmail.com	016561234	Manager	01-01-2023
2	admin2	admin2@gmail.com	25451234	Manager	01-02-2023
3	admin3	admin3@gmail.com	04551234	Staff	01-03-2023
4	admin4	admin4@gmail.com	1532334	Staff	15-03-2023
5	admin5	admin5@gmail.com	12336984	Manager	01-04-2023
6	admin6	admin6@gmail.com	1233684	Staff	05-04-2023
7	admin7	admin7@gmail.com	12338634	Staff	10-04-2023
8	admin8	admin8@gmail.com	126938534	Manager	15-04-2023
9	admin9	admin9@gmail.com	12334534	Staff	18-04-2023
10	admin10	admin10@gmail.com	12354334	Staff	20-04-2023
11	admin11	admin11@gmail.com	123425744	Manager	22-04-2023
12	admin12	admin12@gmail.com	1275274534	Staff	24-04-2023
13	admin13	admin13@gmail.com	1252434	Manager	25-04-2023
14	admin14	admin14@gmail.com	1578237234	Staff	26-04-2023
15	admin15	admin15@gmail.com	12543234	Staff	27-04-2023
16	admin16	admin16@gmail.com	1235244	Manager	28-04-2023
17	admin17	admin17@gmail.com	1237543274	Staff	29-04-2023
18	admin18	admin18@gmail.com	123753274	Staff	30-04-2023

6) (Display all columns and all records from the Reviews table.)

SELECT * FROM Reviews

review_id	book_id	customer_id	rating	comment	review_date
1	1	1	5	Amazing book!	01-04-2024
2	2	2	4	Very helpful.	01-04-2024
3	3	3	3	Quite interesting.	02-04-2024
4	4	4	5	Loved the story.	02-04-2024
5	5	5	4	Motivating read.	03-04-2024
6	6	6	5	Highly recommended.	03-04-2024
7	7	7	3	Good but slow.	04-04-2024
8	8	8	2	Not as expected.	04-04-2024
9	9	9	5	Masterpiece!	05-04-2024
10	10	10	4	Emotional journey.	05-04-2024
11	11	11	3	Informative.	06-04-2024
12	12	12	4	Thrilling!	06-04-2024
13	13	13	5	Best in the series.	07-04-2024
14	14	14	4	Great plot.	07-04-2024
15	15	15	5	Deeply touching.	08-04-2024
16	16	16	4	Lovely writing.	08-04-2024
17	17	17	2	Confusing ending.	09-04-2024
18	18	18	5	Truly inspiring.	09-04-2024

7) (Display all columns and all records from the Order_Items table.)

```
SELECT * FROM Order_Items
```

item_id	order_id	book_id	quantity	price	subtotal
1	1	1	1	12.99	12.99
2	1	2	1	12.99	12.99
3	2	2	1	15.50	15.50
4	3	3	2	11.00	22.00
5	4	4	1	10.99	10.99
6	5	5	1	13.75	13.75
7	6	6	1	17.80	17.80
8	7	3	2	11.00	22.00
9	7	8	1	6.00	6.00
10	8	9	1	13.49	13.49
11	8	10	1	12.99	12.99
12	9	11	1	14.25	14.25
13	9	5	2	11.25	22.50
14	10	14	1	13.25	13.25
15	11	15	1	12.99	12.99
16	12	16	2	12.97	25.94
17	13	17	1	11.60	11.60
18	13	18	1	12.95	12.95

8) (Retrieve all orders placed between April 17, 2024, and April 30, 2024.)

```
SELECT * FROM Orders WHERE order_date BETWEEN '2024-04-17' AND '2024-04-30';
```

Order_id	Customer_id	Order_date	Total_amount	Payment_status	Delivery_status
11	11	2024-04-17	12.99	Unpaid	Pending
12	6	2024-04-17	25.94	Paid	Shipped
13	13	2024-04-18	24.55	Paid	Delivered
14	14	2024-04-18	27.50	Paid	Delivered
15	6	2024-04-19	29.95	Unpaid	Processing
16	18	2024-04-19	14.00	Paid	Delivered
17	8	2024-04-20	31.80	Paid	Shipped
18	18	2024-04-21	15.45	Paid	Delivered

9) (Fetch all books with stock less than 15 units.)

```
SELECT * FROM Books WHERE stock < 15;
```

book_id	title	author	genre	price	stock	category_id
9	Crime and Punishment	Fyodor Dostoevsky	Classic	13.49	12	3
13	The Da Vinci Code	Dan Brown	Thriller	12.50	14	7

10) (Retrieve all admin records where the role is 'Manager')

```
SELECT * FROM Admins WHERE role = 'Manager';
```

Admin_id	Name	Email	Phone	Role	Created_at
1	admin1	admin1@gmail.com	016561234	Manager	01-01-2023
2	admin2	admin2@gmail.com	25451234	Manager	01-02-2023
5	admin5	admin5@gmail.com	12336984	Manager	01-04-2023
8	admin8	admin8@gmail.com	126938534	Manager	15-04-2023
11	admin11	admin11@gmail.com	123425744	Manager	22-04-2023
13	admin13	admin13@gmail.com	1252434	Manager	25-04-2023
16	admin16	admin16@gmail.com	1235244	Manager	28-04-2023

11) (Fetch customer IDs, total amounts, and payment statuses for all orders that have been delivered.)

```
SELECT customer_id,total_amount,Payment_status FROM Orders WHERE delivery_status = 'Delivered';
```

customer_id	total_amount	Payment_status
1	25.98	Paid
3	10.99	Paid
6	28.00	Paid
8	26.49	Paid
10	13.25	Paid
13	24.55	Paid
14	27.50	Paid
18	14.00	Paid
18	15.45	Paid

12) (Retrieve the titles and prices of all books in the inventory.)

```
SELECT title, price FROM Books;
```

title	price
The Alchemist	12.99
Atomic Habits	15.50
1984	11.00
To Kill a Mockingbird	10.99
The Subtle Art...	13.75
Sapiens	17.80
Think and Grow Rich	14.00
Rich Dad Poor Dad	9.99
Crime and Punishment	13.49
The Book Thief	12.30
The Power of Habit	14.25
Digital Fortress	11.75
The Da Vinci Code	12.50
Inferno	13.25
The Kite Runner	12.99
A Thousand Splendid Suns	13.45
The Girl on the Train	11.60
Educated	10.95

13) (Calculate the average rating for each book based on customer reviews)

```
SELECT book_id, AVG(rating) AS avg_rating FROM Reviews GROUP BY book_id;
```

book_id	avg_rating
1	5.0000
2	4.0000
3	3.0000
4	5.0000
5	4.0000
6	5.0000
7	3.0000
8	2.0000
9	5.0000
10	4.0000
11	3.0000
12	4.0000
13	5.0000
14	4.0000
15	5.0000
16	4.0000
17	2.0000
18	5.0000

14) (Count the total number of categories in the system.)

```
SELECT COUNT(*) AS total_categories FROM Categories;
```

total_categories
18

15) (Show the total number of orders placed by each customer.)

```
SELECT customer_id, COUNT(*) AS total_orders FROM Orders GROUP BY customer_id;
```

customer_id	total_orders
1	1
2	1
3	2
5	1
6	4
8	2
9	1
10	1
11	1
13	1
14	1
18	2

16) (Count the number of books available in each genre)

```
SELECT Genre , count(Genre) as Quantity from Books GROUP BY(Genre);
```

Genre	Quantity
Fiction	1
Self-help	4
Dystopian	1
Classic	2
History	1
Finance	1
Historical	1
Thriller	3
Drama	2
Mystery	1
Memoir	1

17) (Calculate the total amount spent by each customer across all their orders.)

```
SELECT customer_id, SUM(total_amount) AS total_spent FROM Orders GROUP BY customer_id ;
```

customer_id	total_spent
1	25.98
2	15.50
3	32.99
5	13.75
6	101.69
8	58.29
9	36.75
10	13.25
11	12.99
13	24.55
14	27.50
18	29.45

18) (Add a new column preferred_genre to the Customers table and updates each customer with their preferred book genre, then displays their name, district, registration date, and preferred genre.)

```
ALTER TABLE Customers
```

```
ADD column preferred_genre VARCHAR(50);
```

```
UPDATE Customers SET preferred_genre = 'Fiction' WHERE customer_id = 1;
```

```
UPDATE Customers SET preferred_genre = 'Self-help' WHERE customer_id = 2;
```

```
UPDATE Customers SET preferred_genre = 'Mystery' WHERE customer_id = 3;
```

```
UPDATE Customers SET preferred_genre = 'Drama' WHERE customer_id = 4;
```

```
UPDATE Customers SET preferred_genre = 'Romance' WHERE customer_id = 5;
```

```
UPDATE Customers SET preferred_genre = 'Science' WHERE customer_id = 6;
```

```
UPDATE Customers SET preferred_genre = 'Thriller' WHERE customer_id = 7;
```

```
UPDATE Customers SET preferred_genre = 'History' WHERE customer_id = 8;
```

```

UPDATE Customers SET preferred_genre = 'Classic' WHERE customer_id = 9;
UPDATE Customers SET preferred_genre = 'Poetry' WHERE customer_id = 10;
UPDATE Customers SET preferred_genre = 'Technology' WHERE customer_id = 11;
UPDATE Customers SET preferred_genre = 'Biography' WHERE customer_id = 12;
UPDATE Customers SET preferred_genre = 'Philosophy' WHERE customer_id = 13;
UPDATE Customers SET preferred_genre = 'Dystopian' WHERE customer_id = 14;
UPDATE Customers SET preferred_genre = 'Religion' WHERE customer_id = 15;
UPDATE Customers SET preferred_genre = 'Finance' WHERE customer_id = 16;
UPDATE Customers SET preferred_genre = 'Fiction' WHERE customer_id = 17;
UPDATE Customers SET preferred_genre = 'Romance' WHERE customer_id = 18;
SELECT Name, Address as District, registration_date, preferred_genre FROM Customers;

```

Name	District	registration_date	preferred_genre
Ayesha Khan	Dhaka	10-01-2024	Fiction
Mehedi Hasan	Chittagong	12-01-2024	Self-help
Tania Rahman	Sylhet	01-02-2024	Mystery
Junaïd Alam	Dhaka	05-02-2024	Drama
Nusrat Jahan	Khulna	10-02-2024	Romance
Arif Hossain	Rajshahi	15-02-2024	Science
Farhana Noor	Comilla	18-02-2024	Thriller
Tamim Iqbal	Barisal	01-03-2024	History
Jannat Ara	Rangpur	05-03-2024	Classic
Sakib Ali	Mymensingh	08-03-2024	Poetry
Salma Akter	Sylhet	11-03-2024	Technology
Shuvo Rahman	Bogura	15-03-2024	Biography
Lamia Haque	Dhaka	17-03-2024	Philosophy
Munna Hossain	Chandpur	20-03-2024	Dystopian
Rifat Karim	Kushtia	25-03-2024	Religion
Shamima Nasrin	Noakhali	28-03-2024	Finance
Saif Ahmed	Cox's Bazar	01-04-2024	Fiction
Nadia Islam	Dhaka	05-04-2024	Romance

19) (Retrieve all customers who have placed at least one order.)

```
SELECT * FROM Customers WHERE customer_id IN (SELECT customer_id FROM Orders);
```

Customer_id	Name	Email	Phone	Address	Registration_date	preferred_genre
1	Ayesha Khan	ayesha@mail.com	01711112222	Dhaka	10-01-2024	Fiction
2	Mehedi Hasan	mehedi@mail.com	01712345678	Chittagong	12-01-2024	Self-help
3	Tania Rahman	tania@mail.com	01811113333	Sylhet	01-02-2024	Mystery
5	Nusrat Jahan	nusrat@mail.com	01688889999	Khulna	10-02-2024	Romance
6	Arif Hossain	arif@mail.com	01923456789	Rajshahi	15-02-2024	Science
8	Tamim Iqbal	tamim@mail.com	01899990000	Barisal	01-03-2024	History
9	Jannat Ara	jannat@mail.com	01911112222	Rangpur	05-03-2024	Classic
10	Sakib Ali	sakib@mail.com	01776543210	Mymensingh	08-03-2024	Poetry
11	Salma Akter	salma@mail.com	01711223344	Sylhet	11-03-2024	Technology
13	Lamia Haque	lamia@mail.com	01987654321	Dhaka	17-03-2024	Philosophy
14	Munna Hossain	munna@mail.com	01799887766	Chandpur	20-03-2024	Dystopian
18	Nadia Islam	nadia@mail.com	01955667788	Dhaka	05-04-2024	Romance

20) (Fetch details of books that have received at least one review.)

```
SELECT book_id,title,Genre FROM Books WHERE book_id IN (SELECT book_id FROM Reviews);
```

book_id	title	Genre
1	The Alchemist	Fiction
2	Atomic Habits	Self-help
3	1984	Dystopian
4	To Kill a Mockingbird	Classic
5	The Subtle Art...	Self-help
6	Sapiens	History
7	Think and Grow Rich	Self-help
8	Rich Dad Poor Dad	Finance
9	Crime and Punishment	Classic
10	The Book Thief	History
11	The Power of Habit	Self-help
12	Digital Fortress	Thriller
13	The Da Vinci Code	Thriller
14	Inferno	Thriller
15	The Kite Runner	Drama
16	A Thousand Splendid Suns	Drama
17	The Girl on the Train	Mystery
18	Educated	Memoir

21) (Retrieve all books priced below the average price of all books.)

```
SELECT * FROM Books WHERE price < (SELECT AVG(price) FROM Books);
```

Book_id	Title	Author	Genre	Price	Stock	Category_id
3	1984	George Orwell	Dystopian	11.00	25	3
4	To Kill a Mockingbird	Harper Lee	Classic	10.99	30	4
8	Rich Dad Poor Dad	Robert Kiyosaki	Finance	9.99	27	6
10	The Book Thief	Markus Zusak	History	12.30	21	5
12	Digital Fortress	Dan Brown	Thriller	11.75	20	7
13	The Da Vinci Code	Dan Brown	Thriller	12.50	14	7
17	The Girl on the Train	Paula Hawkins	Mystery	11.60	26	9
18	Educated	Tara Westover	Memoir	10.95	15	10

22) (Display the top 8 highest-rated books based on average review ratings, in descending order.)

```
SELECT book_id, AVG(rating) AS avg_rating
```

```
FROM Reviews
```

```
GROUP BY book_id
```

```
ORDER BY avg_rating DESC
```

```
LIMIT 8;
```

book_id	avg_rating
18	5.0000
1	5.0000
9	5.0000
13	5.0000
6	5.0000
4	5.0000
15	5.0000
16	4.0000

Conclusion:

This report presents a comprehensive overview of the bookstore database through various SQL queries, providing insights into book inventory, customer preferences, sales performance, and administrative roles. The data retrieved supports efficient decision-making by identifying popular genres, top-rated books, customer purchase behavior, and inventory needs. These findings can help improve customer satisfaction, optimize stock management, and enhance overall business operations.