

QUESTION:

Lab 3: Create a database called library_db and a table books with columns: book_id, title, author, publisher, year_of_publication, and price. Insert five records into the table.

CODE:

```
CREATE DATABASE library_db;

CREATE TABLE books (
    book_id INT PRIMARY KEY,
    title VARCHAR(100),
    author VARCHAR(100),
    publisher VARCHAR(100),
    year_of_publication INT,
    price DECIMAL(10,2)
);

INSERT INTO books (book_id, title, author, publisher, year_of_publication, price)
VALUES
(1, 'Introduction to SQL', 'James Smith', 'TechPress', 2018, 450.00),
(2, 'Database Management Systems', 'Navathe', 'Pearson', 2016, 650.00),
(3, 'Learning Python', 'Mark Lutz', 'OReilly', 2015, 799.00),
(4, 'Web Development Guide', 'John Doe', 'WebBooks', 2020, 550.00),
(5, 'Advanced Java Programming', 'Herbert Schildt', 'McGraw Hill', 2019, 700.00);
```

SCREENSHOT:

		book_id	title	author	publisher	year_of_publication	price
<input type="checkbox"/>	Edit Copy Delete	1	Introduction to SQL	James Smith	TechPress	2018	450.00
<input type="checkbox"/>	Edit Copy Delete	2	Database Management Systems	Navathe	Pearson	2016	650.00
<input type="checkbox"/>	Edit Copy Delete	3	Learning Python	Mark Lutz	OReilly	2015	799.00
<input type="checkbox"/>	Edit Copy Delete	4	Web Development Guide	John Doe	WebBooks	2020	550.00
<input type="checkbox"/>	Edit Copy Delete	5	Advanced Java Programming	Herbert Schildt	McGraw Hill	2019	700.00
<input type="checkbox"/>	Check all	With selected:		Edit	Copy	Delete	Export

QUESTION:

Lab 4: Create a table members in library_db with columns: member_id, member_name, date_of_membership, and email. Insert five records into this table.

CODE:

```
CREATE TABLE members (  
    member_id INT PRIMARY KEY,  
    member_name VARCHAR(100),  
    date_of_membership DATE,  
    email VARCHAR(100)  
);  
  
INSERT INTO members (member_id, member_name, date_of_membership, email)  
VALUES  
(1, 'Rahul Sharma', '2022-01-15', 'rahul.sharma@example.com'),  
(2, 'Priya Patel', '2021-12-20', 'priya.patel@example.com'),  
(3, 'Amit Kumar', '2023-03-05', 'amit.kumar@example.com'),  
(4, 'Sneha Mehta', '2022-07-10', 'sneha.mehta@example.com'),  
(5, 'Karan Joshi', '2023-01-25', 'karan.joshi@example.com');
```

SCREENSHOT:

		book_id	title	author	publisher	year_of_publication	price
<input type="checkbox"/>	Edit Copy Delete	1	Introduction to SQL	James Smith	TechPress	2018	450.00
<input type="checkbox"/>	Edit Copy Delete	2	Database Management Systems	Navathe	Pearson	2016	650.00
<input type="checkbox"/>	Edit Copy Delete	3	Learning Python	Mark Lutz	OReilly	2015	799.00
<input type="checkbox"/>	Edit Copy Delete	4	Web Development Guide	John Doe	WebBooks	2020	550.00
<input type="checkbox"/>	Edit Copy Delete	5	Advanced Java Programming	Herbert Schildt	McGraw Hill	2019	700.00
<input type="checkbox"/>	Check all	With selected:		Edit	Copy	Delete	Export

QUESTION:

Lab 3: Retrieve all members who joined the library before 2022. Use appropriate SQL syntax with WHERE and ORDER BY.

CODE:

```
SELECT *  
FROM members  
WHERE date_of_membership < '2022-01-01'  
ORDER BY date_of_membership ASC;
```

SCREENSHOT:

		book_id	title	author	publisher	year_of_publication	price
<input type="checkbox"/>	Edit Copy Delete	1	Introduction to SQL	James Smith	TechPress	2018	450.00
<input type="checkbox"/>	Edit Copy Delete	2	Database Management Systems	Navathe	Pearson	2016	650.00
<input type="checkbox"/>	Edit Copy Delete	3	Learning Python	Mark Lutz	OReilly	2015	799.00
<input type="checkbox"/>	Edit Copy Delete	4	Web Development Guide	John Doe	WebBooks	2020	550.00
<input type="checkbox"/>	Edit Copy Delete	5	Advanced Java Programming	Herbert Schildt	McGraw Hill	2019	700.00
<input type="checkbox"/>	Check all	With selected:		Edit Copy Delete	Export		

QUESTION:

Lab 4: Write SQL queries to display the titles of books published by a specific author. Sort the results by year_of_publication in descending order.

CODE:

```
SELECT title, author, year_of_publication  
FROM books  
WHERE author = 'Mark Lutz'  
ORDER BY year_of_publication DESC;
```

SCREENSHOT:

		title	author	year_of_publication
<input type="checkbox"/>	Edit Copy Delete	Learning Python	Mark Lutz	2015
	<input type="checkbox"/> Check all	With selected: Edit Copy Delete		Export
<input type="checkbox"/> Show all	Number of rows: 25	Filter rows: <input type="text" value="Search this table"/>		

QUESTION:

Lab 3: Add a CHECK constraint to ensure that the price of books in the books table is greater than 0.

CODE:

ALTER TABLE books

ADD CONSTRAINT chk_price CHECK (price > 0);

SCREENSHOT:

		book_id	title	author	publisher	year_of_publication	price
<input type="checkbox"/>	Edit Copy Delete	1	Introduction to SQL	James Smith	TechPress	2018	450.00
<input type="checkbox"/>	Edit Copy Delete	2	Database Management Systems	Navathe	Pearson	2016	650.00
<input type="checkbox"/>	Edit Copy Delete	3	Learning Python	Mark Lutz	OReilly	2015	799.00
<input type="checkbox"/>	Edit Copy Delete	4	Web Development Guide	John Doe	WebBooks	2020	550.00
<input type="checkbox"/>	Edit Copy Delete	5	Advanced Java Programming	Herbert Schildt	McGraw Hill	2019	700.00
	<input type="checkbox"/> Check all With selected: Edit Copy Delete Export						
<div><input type="checkbox"/> Show all Number of rows: <div>25</div> Filter rows: <div>Search this table</div> Sort by key: <div>None</div></div>							

QUESTION:

Lab 4: Modify the members table to add a UNIQUE constraint on the email column, ensuring that each member has a unique email address.

CODE:

```
ALTER TABLE members
```

```
ADD CONSTRAINT unique_email UNIQUE (email);
```

SCREENSHOT:

		member_id	member_name	date_of_membership	email
<input type="checkbox"/>	Edit Copy Delete	1	Rahul Sharma	2022-01-15	rahul.sharma@example.com
<input type="checkbox"/>	Edit Copy Delete	2	Priya Patel	2021-12-20	priya.patel@example.com
<input type="checkbox"/>	Edit Copy Delete	3	Amit Kumar	2023-03-05	amit.kumar@example.com
<input type="checkbox"/>	Edit Copy Delete	4	Sneha Mehta	2022-07-10	sneha.mehta@example.com
<input type="checkbox"/>	Edit Copy Delete	5	Karan Joshi	2023-01-25	karan.joshi@example.com
	<input type="checkbox"/> Check all	With selected:		Edit	Copy Delete Export

QUESTION:

Lab 3: Create a table authors with the following columns: author_id, first_name, last_name, and country. Set author_id as the primary key.

CODE:

```
CREATE TABLE authors (  
    author_id INT PRIMARY KEY,  
    first_name VARCHAR(100),  
    last_name VARCHAR(100),  
    country VARCHAR(100)  
);
```

SCREENSHOT:


✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0016 seconds.)

```
SELECT * FROM `authors`
```

☐ Profiling [[Edit inline](#)] [[Edit](#)] [[Explain SQL](#)] [[Create PHP code](#)] [[Refresh](#)]

author_id	first_name	last_name	country
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Query results operations

 Create view

QUESTION:

Lab 4: Create a table publishers with columns: publisher_id, publisher_name, contact_number, and address. Set publisher_id as the primary key and contact_number as unique.

CODE:

```
CREATE TABLE publishers (  
    publisher_id INT PRIMARY KEY,  
    publisher_name VARCHAR(150),  
    contact_number VARCHAR(20) UNIQUE,  
    address VARCHAR(200)  
);
```

SCREENSHOT:

```
SELECT * FROM `publishers`
```

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publisher_id	publisher_name	contact_number	address
--------------	----------------	----------------	---------

QUESTION:

Lab 3: Add a new column genre to the books table. Update the genre for all existing records.

CODE:

```
ALTER TABLE books
```

```
ADD genre VARCHAR(50);
```

```
UPDATE books
```

```
SET genre = 'Education'
```

```
WHERE book_id = 1;
```

```
UPDATE books
```

```
SET genre = 'Technology'
```

```
WHERE book_id = 2;
```

```
UPDATE books
```

```
SET genre = 'Programming'
```

```
WHERE book_id = 3;
```

```
UPDATE books
```

```
SET genre = 'Web Development'
```

```
WHERE book_id = 4;
```

```
UPDATE books
```

```
SET genre = 'Java'
```

```
WHERE book_id = 5;
```

SCREENSHOT:

		book_id	title	author	publisher	year_of_publication	price	genre
<input type="checkbox"/>	Edit	Copy	Delete	1	Introduction to SQL	James Smith	TechPress	2018 450.00 Education
<input type="checkbox"/>	Edit	Copy	Delete	2	Database Management Systems	Navathe	Pearson	2016 650.00 Technology
<input type="checkbox"/>	Edit	Copy	Delete	3	Learning Python	Mark Lutz	OReilly	2015 799.00 Programming
<input type="checkbox"/>	Edit	Copy	Delete	4	Web Development Guide	John Doe	WebBooks	2020 550.00 Web Development
<input type="checkbox"/>	Edit	Copy	Delete	5	Advanced Java Programming	Herbert Schildt	McGraw Hill	2019 700.00 Java
<div>↑ <input type="checkbox"/> Check all With selected: Edit Copy Delete Export</div> <div><input type="checkbox"/> Show all Number of rows: 25 Filter rows: Search this table Sort by key: None</div>								

QUESTION:

Lab 4: Modify the members table to increase the length of the email column to 100 characters.

CODE:

ALTER TABLE members

MODIFY email VARCHAR(100);

SCREENSHOT:

<div><div><div>←</div><div>→</div></div><div></div></div>				member_id	member_name	date_of_membership	email
<div><div><input type="checkbox"/></div><div><div><div></div><div></div><div></div></div></div><div>Edit</div><div><div><div></div><div></div><div></div></div></div><div>Copy</div><div><div><div></div></div></div><div>Delete</div></div>	1	Rahul Sharma	2022-01-15	rahul.sharma@example.com			
<div><div><input type="checkbox"/></div><div><div><div></div><div></div><div></div></div></div><div>Edit</div><div><div><div></div><div></div><div></div></div></div><div>Copy</div><div><div><div></div></div></div><div>Delete</div></div>	2	Priya Patel	2021-12-20	priya.patel@example.com			
<div><div><input type="checkbox"/></div><div><div><div></div><div></div><div></div></div></div><div>Edit</div><div><div><div></div><div></div><div></div></div></div><div>Copy</div><div><div><div></div></div></div><div>Delete</div></div>	3	Amit Kumar	2023-03-05	amit.kumar@example.com			
<div><div><input type="checkbox"/></div><div><div><div></div><div></div><div></div></div></div><div>Edit</div><div><div><div></div><div></div><div></div></div></div><div>Copy</div><div><div><div></div></div></div><div>Delete</div></div>	4	Sneha Mehta	2022-07-10	sneha.mehta@example.com			
<div><div><input type="checkbox"/></div><div><div><div></div><div></div><div></div></div></div><div>Edit</div><div><div><div></div><div></div><div></div></div></div><div>Copy</div><div><div><div></div></div></div><div>Delete</div></div>	5	Karan Joshi	2023-01-25	karan.joshi@example.com			
<div><div><div><div></div><div></div></div><div><input type="checkbox"/></div><div>Check all</div></div><div><div>With selected:</div><div><div><div></div><div></div><div></div></div></div><div>Edit</div><div><div><div></div><div></div><div></div></div></div><div>Copy</div><div><div><div></div></div></div><div>Delete</div><div><div><div></div><div></div><div></div></div></div><div>Export</div></div></div>							

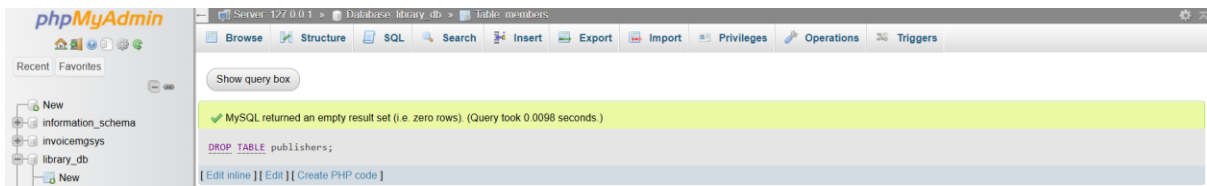
QUESTION:

Lab 3: Drop the publishers table from the database after verifying its structure.

CODE:

DROP TABLE publishers;

SCREENSHOT:



QUESTION:

Lab 4: Create a backup of the members table and then drop the original members table.

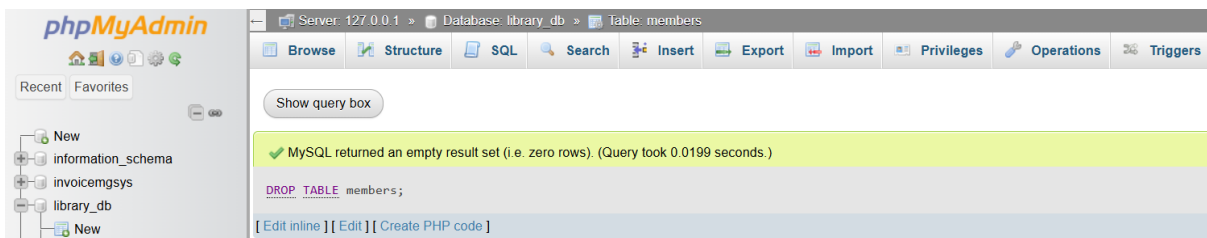
CODE:

```
CREATE TABLE members_backup AS
```

```
SELECT * FROM members;
```

```
DROP TABLE members;
```

SCREENSHOT:



QUESTION:

Lab 4: Insert three new authors into the authors table, then update the last name of one of the authors.

CODE:

```
INSERT INTO authors (author_id, first_name, last_name, country)
```

```
VALUES
```

```
(1, 'Robert', 'Martin', 'USA'),
```

```
(2, 'Ken', 'Thompson', 'USA'),
```

```
(3, 'Dennis', 'Ritchie', 'USA');
```

UPDATE authors

SET last_name = 'Richards'

WHERE author_id = 3;

SCREENSHOT:

				author_id	first_name	last_name	country				
<input type="checkbox"/>		Edit		Copy		Delete	1 Robert Martin USA				
<input type="checkbox"/>		Edit		Copy		Delete	2 Ken Thompson USA				
<input type="checkbox"/>		Edit		Copy		Delete	3 Dennis Richards USA				
				With selected:							
					Edit		Copy		Delete		Export

QUESTION:

Lab 5: Delete a book from the books table where the price is higher than \$100.

CODE:

DELETE FROM books

WHERE price > 100;

SCREENSHOT:

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0006 seconds.)

```
SELECT * FROM `books`
```

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book_id	title	author	publisher	year_of_publication	price	genre
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Query results operations

Create view

QUESTION:

Lab 3: Update the year_of_publication of a book with a specific book_id.

CODE:

UPDATE books

```
SET year_of_publication = 2021
```

```
WHERE book_id = 3;
```

SCREENSHOT:

	book_id	title	author	publisher	year_of_publication	price	genre
<input type="checkbox"/> Edit Copy Delete	6	Data Structures and Algorithms	Robert Lafore	TechPress	2022	750.00	Programming
Check all With selected: Edit Copy Delete Export							

QUESTION:

Lab 4: Increase the price of all books published before 2015 by 10%.









CODE:

UPDATE books

$$\text{SET price} = \text{price} * 1.10$$

```
WHERE year_of_publication < 2015;
```

SCREENSHOT:

	book_id	title	author	publisher	year_of_publication	price	genre
<input type="checkbox"/>  Edit  Copy  Delete	6	Data Structures and Algorithms	Robert Lafore	TechPress	2014	825.00	Programming
 <input type="checkbox"/> Check all With selected:  Edit  Copy  Delete  Export							
<input type="checkbox"/> Show all Number of rows: 25 Filter rows: <input type="text" value="Search this table"/>							

QUESTION:

Lab 3: Remove all members who joined before 2020 from the members table.

CODE:

```
DELETE FROM members_backup
WHERE date_of_membership < '2020-01-01';
```

SCREENSHOT:

member_id	member_name	date_of_membership	email
1	Rahul Sharma	2022-01-15	rahul.sharma@example.com
2	Priya Patel	2021-12-20	priya.patel@example.com
3	Amit Kumar	2023-03-05	amit.kumar@example.com
4	Sneha Mehta	2022-07-10	sneha.mehta@example.com
5	Karan Joshi	2023-01-25	karan.joshi@example.com

QUESTION:

Lab 4: Delete all books that have a NULL value in the author column.

CODE:

```
DELETE FROM books
WHERE author IS NULL;
```

SCREENSHOT:

	book_id	title	author	publisher	year_of_publication	price	genre
<input type="checkbox"/> Edit Copy Delete	6	Data Structures and Algorithms	Robert Lafore	TechPress	2014	825.00	Programming
↑ <input type="checkbox"/> Check all	With selected:		Edit Copy Delete	Export			

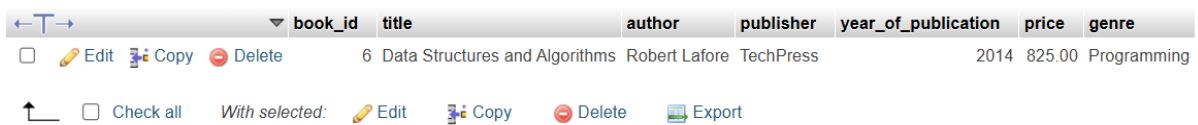
QUESTION:

Lab 4: Write a query to retrieve all books with price between \$50 and \$100.

CODE:

```
SELECT *  
FROM books  
WHERE price BETWEEN 50 AND 100;
```

SCREENSHOT:



A screenshot of a database application interface. At the top, there is a toolbar with icons for navigation and editing. Below the toolbar is a table with columns: book_id, title, author, publisher, year_of_publication, price, and genre. The table contains one row of data. Below the table, there is another toolbar with icons for selection, editing, and exporting.

	book_id	title	author	publisher	year_of_publication	price	genre
<input type="checkbox"/> Edit Copy Delete	6	Data Structures and Algorithms	Robert Lafore	TechPress	2014	825.00	Programming

Check all With selected: Edit Copy Delete Export

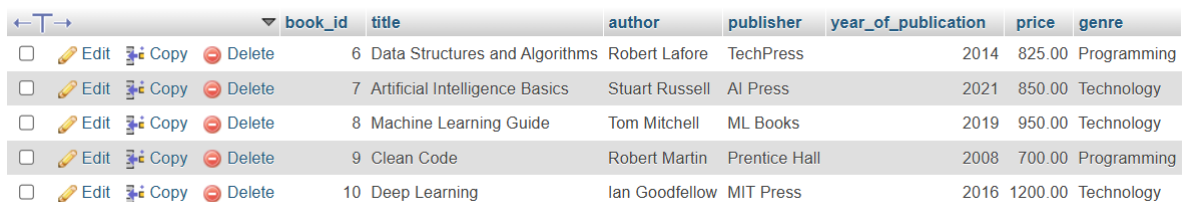
QUESTION:

Lab 5: Retrieve the list of books sorted by author in ascending order and limit the results to the top 3 entries.

CODE:

```
SELECT *  
FROM books  
ORDER BY author ASC  
LIMIT 3;
```

SCREENSHOT:



A screenshot of a database application interface showing a table with columns: book_id, title, author, publisher, year_of_publication, price, and genre. The table contains three rows of data. Each row has a toolbar with icons for selection, editing, and deleting.

	book_id	title	author	publisher	year_of_publication	price	genre
<input type="checkbox"/> Edit Copy Delete	6	Data Structures and Algorithms	Robert Lafore	TechPress	2014	825.00	Programming
<input type="checkbox"/> Edit Copy Delete	7	Artificial Intelligence Basics	Stuart Russell	AI Press	2021	850.00	Technology
<input type="checkbox"/> Edit Copy Delete	8	Machine Learning Guide	Tom Mitchell	ML Books	2019	950.00	Technology

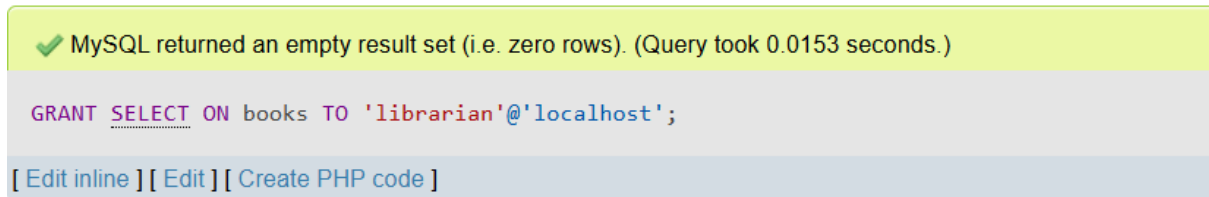
QUESTION:

Lab 3: Grant SELECT permission to a user named librarian on the books table.

CODE:

```
GRANT SELECT ON books TO 'librarian'@'localhost';
```

SCREENSHOT:



✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0153 seconds.)

```
GRANT SELECT ON books TO 'librarian'@'localhost';
```

[[Edit inline](#)] [[Edit](#)] [[Create PHP code](#)]

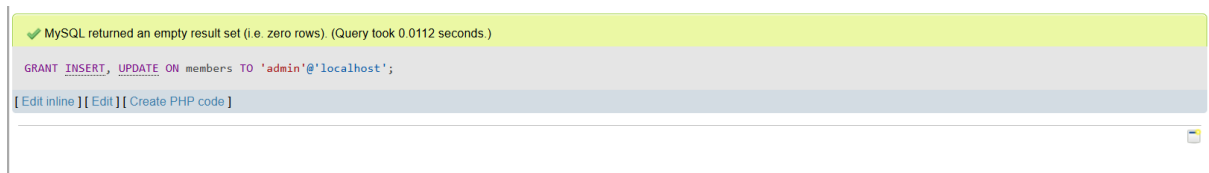
QUESTION:

Lab 4: Grant INSERT and UPDATE permissions to the user admin on the members table.

CODE:

```
GRANT INSERT, UPDATE ON members TO 'admin'@'localhost';
```

SCREENSHOT:



✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0112 seconds.)

```
GRANT INSERT, UPDATE ON members TO 'admin'@'localhost';
```

[[Edit inline](#)] [[Edit](#)] [[Create PHP code](#)]

QUESTION:

Lab 3: Revoke the INSERT privilege from the user librarian on the books table.

CODE:

```
REVOKE INSERT ON books FROM 'librarian'@'localhost';
```

SCREENSHOT:

<div>⏪ ⏩</div>		▼ book_id	title	author	publisher	year_of_publication	price	genre
<input type="checkbox"/>	<div><div>✎ Edit</div><div>📄 Copy</div><div>🗑 Delete</div></div>	6	Data Structures and Algorithms	Robert Lafore	TechPress	2014	825.00	Programming
<input type="checkbox"/>	<div><div>✎ Edit</div><div>📄 Copy</div><div>🗑 Delete</div></div>	7	Artificial Intelligence Basics	Stuart Russell	AI Press	2021	850.00	Technology
<input type="checkbox"/>	<div><div>✎ Edit</div><div>📄 Copy</div><div>🗑 Delete</div></div>	8	Machine Learning Guide	Tom Mitchell	ML Books	2019	950.00	Technology
<input type="checkbox"/>	<div><div>✎ Edit</div><div>📄 Copy</div><div>🗑 Delete</div></div>	9	Clean Code	Robert Martin	Prentice Hall	2008	700.00	Programming
<input type="checkbox"/>	<div><div>✎ Edit</div><div>📄 Copy</div><div>🗑 Delete</div></div>	10	Deep Learning	Ian Goodfellow	MIT Press	2016	1200.00	Technology
<div><div>⏮</div><div><input type="checkbox"/> Check all</div><div>With selected:</div><div><div>✎ Edit</div><div>📄 Copy</div><div>🗑 Delete</div><div>📄 Export</div></div></div>								

QUESTION:

Lab 4: Revoke all permissions from user admin on the members table.

CODE:

```
REVOKE ALL PRIVILEGES ON members FROM 'admin'@'localhost';
```

SCREENSHOT:

Show query box

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0022 seconds.)

REVOKE ALL PRIVILEGES ON members FROM 'admin'@'localhost';

[Edit inline] [Edit] [Create PHP code]

QUESTION:

Lab 3: Use COMMIT after inserting multiple records into the books table, then make another insertion and perform a ROLLBACK.

CODE:

```
START TRANSACTION;
```

```
INSERT INTO books (book_id, title, author, publisher, year_of_publication, price, genre)
```

```
VALUES
```

```
(14, 'Cloud Computing Basics', 'Thomas Erl', 'TechWorld', 2020, 700.00, 'Technology');
```

```
ROLLBACK;
```


QUESTION:

Lab 3: Perform an INNER JOIN between books and authors tables to display the title of books and their respective authors' names.

CODE:

SELECT

books.title,
authors.first_name,
authors.last_name

FROM books

INNER JOIN authors

ON books.author = CONCAT(authors.first_name, ' ', authors.last_name);

SCREENSHOT:

		member_id	member_name	date_of_membership	email
<input type="checkbox"/>	Edit Copy Delete	1	Rahul S.	2022-01-15	rahul.sharma@example.com
<input type="checkbox"/>	Edit Copy Delete	2	Priya Patel	2021-12-20	new.priya@example.com
<input type="checkbox"/>	Edit Copy Delete	3	Amit Kumar	2023-03-05	amit.kumar@example.com
<input type="checkbox"/>	Edit Copy Delete	4	Sneha Mehta	2022-07-10	sneha.mehta@example.com
<input type="checkbox"/>	Edit Copy Delete	5	Karan Joshi	2023-01-25	karan.joshi@example.com
	<input type="checkbox"/> Check all	With selected: Edit Copy Delete Export			

QUESTION:

Lab 4: Use a FULL OUTER JOIN to retrieve all records from the books and authors tables, including those with no matching entries in the other table.

CODE:

SELECT

books.title,
authors.first_name,
authors.last_name

FROM books

LEFT JOIN authors

ON books.author = CONCAT(authors.first_name, ' ', authors.last_name)

UNION

SELECT

books.title,

authors.first_name,

authors.last_name

FROM books

RIGHT JOIN authors

ON books.author = CONCAT(authors.first_name, ' ', authors.last_name);

SCREENSHOT:

title	first_name	last_name
Clean Code	Robert	Martin
Data Structures and Algorithms	NULL	NULL
Artificial Intelligence Basics	NULL	NULL
Machine Learning Guide	NULL	NULL
Deep Learning	NULL	NULL
Networking Essentials	NULL	NULL
Operating Systems Concepts	NULL	NULL
Computer Architecture	NULL	NULL
NULL	Ken	Thompson
NULL	Dennis	Richards

QUESTION:

Lab 3: Group books by genre and display the total number of books in each genre.

CODE:

```
SELECT genre,COUNT(*) AS total_books  
FROM books  
GROUP BY genre;
```

SCREENSHOT:

<input type="checkbox"/> Show all	Number of rows: 25	Filter rows: Search this table
Extra options		
genre	total_books	
Programming	2	
Technology	6	

<input type="checkbox"/> Show all	Number of rows: 25	Filter rows: Search this table

QUESTION:

Lab 4: Group members by the year they joined and find the number of members who joined each year.

CODE:

```
SELECT YEAR(date_of_membership) AS join_year,COUNT(*) AS total_members  
FROM members  
GROUP BY YEAR(date_of_membership);
```

SCREENSHOT:

join_year	total_members
2021	1
2022	2
2023	2

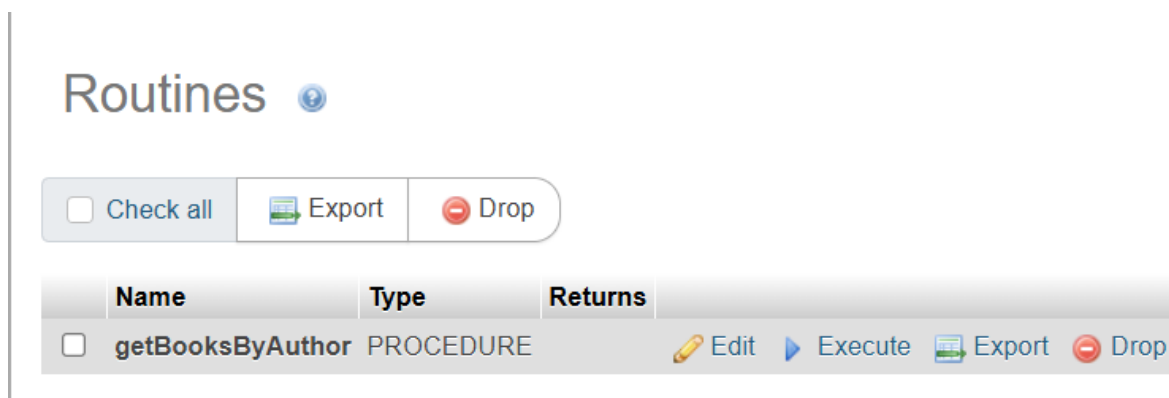
QUESTION:

Lab 3: Write a stored procedure to retrieve all books by a particular author.

CODE:

```
DELIMITER //  
  
CREATE PROCEDURE getBooksByAuthor(IN authorName VARCHAR(100))  
  
BEGIN  
  
SELECT * FROM books WHERE author=authorName;  
  
END //  
  
DELIMITER ;
```

SCREENSHOT:



QUESTION:



Lab 4: Write a stored procedure that takes book_id as an argument and returns the price of the book.

CODE:

```
DELIMITER //  
  
CREATE PROCEDURE getBookPrice(IN bid INT)  
  
BEGIN  
  
SELECT price FROM books WHERE book_id=bid;  
  
END //  
  
DELIMITER ;
```

SCREENSHOT:

Routines

☐ Check all  Export  Drop

	Name	Type	Returns	
<input type="checkbox"/>	getBookPrice	PROCEDURE		 Edit  Execute  Export  Drop
<input type="checkbox"/>	getBooksByAuthor	PROCEDURE		 Edit  Execute  Export  Drop

QUESTION:

Lab 3: Create a view to show only the title, author, and price of books from the books table.

CODE:

```
CREATE VIEW books_view AS
```

```
SELECT title,author,price
```

```
FROM books;
```

SCREENSHOT:

☐ Show all

Number of rows: 25

Filter rows:

Extra options

<div><div><div>←</div><div>T</div><div>→</div></div></div>	title	author	price
<div><div><input type="checkbox"/></div><div><div><div><div></div><div></div><div></div></div><div>Edit</div></div><div><div><div><div></div><div></div><div></div></div><div>Copy</div></div><div><div><div><div></div><div></div><div></div></div><div>Delete</div></div></div></div></div><td>Data Structures and Algorithms</td><td>Robert Lafore</td><td>825.00</td></div>	Data Structures and Algorithms	Robert Lafore	825.00
<div><div><input type="checkbox"/></div><div><div><div><div></div><div></div><div></div></div><div>Edit</div></div><div><div><div><div></div><div></div><div></div></div><div>Copy</div></div><div><div><div><div></div><div></div><div></div></div><div>Delete</div></div></div></div></div><td>Artificial Intelligence Basics</td><td>Stuart Russell</td><td>850.00</td></div>	Artificial Intelligence Basics	Stuart Russell	850.00
<div><div><input type="checkbox"/></div><div><div><div><div></div><div></div><div></div></div><div>Edit</div></div><div><div><div><div></div><div></div><div></div></div><div>Copy</div></div><div><div><div><div></div><div></div><div></div></div><div>Delete</div></div></div></div></div><td>Machine Learning Guide</td><td>Tom Mitchell</td><td>950.00</td></div>	Machine Learning Guide	Tom Mitchell	950.00
<div><div><input type="checkbox"/></div><div><div><div><div></div><div></div><div></div></div><div>Edit</div></div><div><div><div><div></div><div></div><div></div></div><div>Copy</div></div><div><div><div><div></div><div></div><div></div></div><div>Delete</div></div></div></div></div><td>Clean Code</td><td>Robert Martin</td><td>700.00</td></div>	Clean Code	Robert Martin	700.00
<div><div><input type="checkbox"/></div><div><div><div><div></div><div></div><div></div></div><div>Edit</div></div><div><div><div><div></div><div></div><div></div></div><div>Copy</div></div><div><div><div><div></div><div></div><div></div></div><div>Delete</div></div></div></div></div><td>Deep Learning</td><td>Ian Goodfellow</td><td>1200.00</td></div>	Deep Learning	Ian Goodfellow	1200.00
<div><div><input type="checkbox"/></div><div><div><div><div></div><div></div><div></div></div><div>Edit</div></div><div><div><div><div></div><div></div><div></div></div><div>Copy</div></div><div><div><div><div></div><div></div><div></div></div><div>Delete</div></div></div></div></div><td>Networking Essentials</td><td>James Kurose</td><td>600.00</td></div>	Networking Essentials	James Kurose	600.00
<div><div><input type="checkbox"/></div><div><div><div><div></div><div></div><div></div></div><div>Edit</div></div><div><div><div><div></div><div></div><div></div></div><div>Copy</div></div><div><div><div><div></div><div></div><div></div></div><div>Delete</div></div></div></div></div><td>Operating Systems Concepts</td><td>Abraham Silberschatz</td><td>850.00</td></div>	Operating Systems Concepts	Abraham Silberschatz	850.00
<div><div><input type="checkbox"/></div><div><div><div><div></div><div></div><div></div></div><div>Edit</div></div><div><div><div><div></div><div></div><div></div></div><div>Copy</div></div><div><div><div><div></div><div></div><div></div></div><div>Delete</div></div></div></div></div><td>Computer Architecture</td><td>John Hennessy</td><td>900.00</td></div>	Computer Architecture	John Hennessy	900.00

QUESTION:

Lab 4: Create a view to display members who joined before 2020.

CODE:

```
CREATE VIEW members_before_2020 AS  
  
SELECT *  
  
FROM members  
  
WHERE date_of_membership < '2020-01-01';
```

SCREENSHOT:

The screenshot shows a MySQL query execution interface. At the top, a green status bar indicates: "MySQL returned an empty result set (i.e. zero rows). (Query took 0.0010 seconds.)". Below this, the SQL query is displayed: `SELECT * FROM `members_before_2020``. A toolbar contains a checkbox for "Profiling" and links for "Edit inline", "Edit", "Explain SQL", "Create PHP code", and "Refresh". Below the toolbar, a table header is shown with four columns: `member_id`, `member_name`, `date_of_membership`, and `email`. At the bottom, there is a "Query results operations" dropdown menu and a "Create view" button.

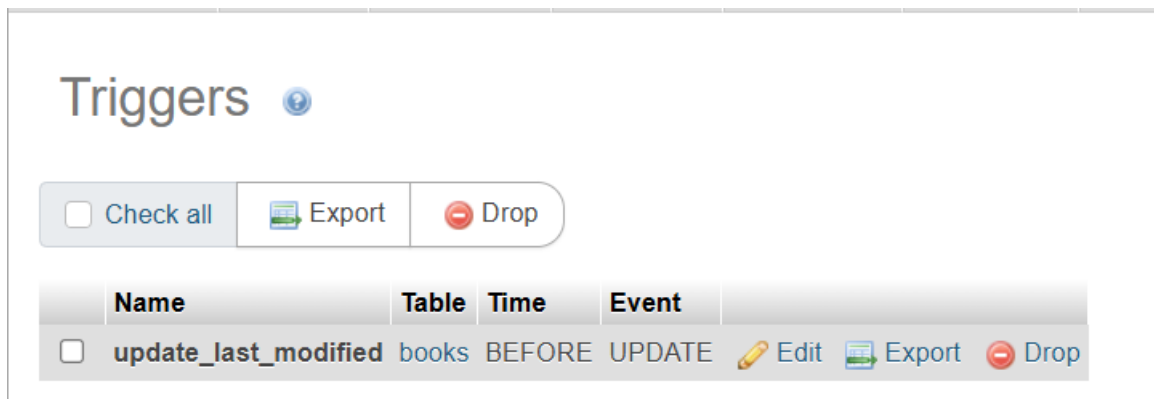
QUESTION:

Lab 3: Create a trigger to automatically update the last_modified timestamp of the books table whenever a record is updated.

CODE:

```
DELIMITER //  
  
CREATE TRIGGER update_last_modified  
  
BEFORE UPDATE ON books  
  
FOR EACH ROW  
  
BEGIN  
  
SET NEW.last_modified=CURRENT_TIMESTAMP;  
  
END //DELIMITER ;
```

SCREENSHOT:



QUESTION:

Lab 4: Create a trigger that inserts a log entry into a log_changes table whenever a DELETE operation is performed on the books table.

CODE:

```
DELIMITER //
CREATE TRIGGER log_book_deletion
AFTER DELETE ON books
FOR EACH ROW
BEGIN
INSERT INTO log_changes(book_id,title,deleted_at)
VALUES(OLD.book_id,OLD.title,CURRENT_TIMESTAMP);
END //
DELIMITER ;
```

SCREENSHOT:

	Name	Table	Time	Event	
<input type="checkbox"/>	log_book_deletion	books	AFTER	DELETE	Edit Export Drop
<input type="checkbox"/>	update_last_modified	books	BEFORE	UPDATE	Edit Export Drop

QUESTION:

Lab 3: Write a PL/SQL block to insert a new book into the books table and display a confirmation message.

CODE:

```
DELIMITER //
```

```
CREATE PROCEDURE insertBook()
```

```
BEGIN
```

```
INSERT INTO books (book_id, title, author, publisher, year_of_publication, price, genre)
```

```
VALUES (15,'Python Programming','Mark Lutz','OReilly',2023,800.00,'Programming');
```

```
SELECT 'Book inserted successfully.' AS message;
```

```
END //
```

```
DELIMITER ;
```

SCREENSHOT:

The screenshot displays a database management tool interface with a top menu bar containing tabs for Structure, SQL, Search, Query, Export, Import, Operations, Privileges, and Routines. Below the menu bar, there is a 'Show query box' button. A warning message states: 'Current selection does not contain a unique column. Grid edit, checkbox, Edit, Copy and Delete features are not available.' Below this, a green status bar indicates: 'Showing rows 0 - 0 (1 total, Query took 0.0032 seconds.)'. The main area shows the executed PL/SQL code: `CALL insertBook();`. Below the code, there are links for '[Edit inline]', '[Edit]', and '[Create PHP code]'. A control bar includes a 'Show all' checkbox, a 'Number of rows' dropdown set to 25, and a 'Filter rows' search box. An 'Extra options' button is also present. At the bottom, a 'message' section displays the output: 'Book inserted successfully.' Below the message, there is another control bar with 'Show all', 'Number of rows' (25), and 'Filter rows' (Search this table).

QUESTION:

Lab 4: Write a PL/SQL block to display the total number of books in the books table.

CODE:

```
DELIMITER //  
  
CREATE PROCEDURE getTotalBooks()  
BEGIN  
    SELECT COUNT(*) AS total_books FROM books;  
END //  
  
DELIMITER ;
```

SCREENSHOT:

The screenshot displays a database query results interface. At the top, there is a button labeled "Extra options". Below it, a table header shows "total_books" in a bold, dark grey box. Underneath the header, the value "9" is displayed. Below the table, there is a control bar with a "Show all" checkbox, a "Number of rows:" label with a dropdown menu set to "25", and a "Filter rows:" label with a search input field containing the text "Search this table". At the bottom, there is a "Query results operations" section with three buttons: "Print" (with a printer icon), "Copy to clipboard" (with a copy icon), and "Create view" (with a view icon).

QUESTION:

Lab 3: Write a PL/SQL block to declare variables for book_id and price, assign values, and display the results.

CODE:

```
DELIMITER //
```



```
CREATE PROCEDURE showBookInfo()
```



```
BEGIN
```



```
    DECLARE v_book_id INT;
```



```
    DECLARE v_price DECIMAL(10,2);
```



```
    SET v_book_id = 101;
```



```
    SET v_price = 499.99;
```



```
    SELECT v_book_id AS book_id, v_price AS price;
```



```
END //
```



```
DELIMITER ;
```

SCREENSHOT:

The screenshot displays a database query results interface. At the top, there is a control bar with a "Show all" checkbox, a "Number of rows" dropdown set to 25, and a "Filter rows" search box labeled "Search this table". Below this is an "Extra options" button. The main area shows a table with two columns: "book_id" and "price". The first row contains the values "101" and "499.99". Below the table is another control bar identical to the one at the top. At the bottom, a "Query results operations" menu is open, showing three options: "Print" (with a printer icon), "Copy to clipboard" (with a copy icon), and "Create view" (with a view icon).

book_id	price
101	499.99

QUESTION:

Lab 4: Write a PL/SQL block using constants and perform arithmetic operations on book prices.

CODE:

```
DELIMITER //
```



```
CREATE PROCEDURE priceOperations()
```



```
BEGIN
```



```
    DECLARE CONST_DISCOUNT DECIMAL(5,2) DEFAULT 50.00;
```



```
    DECLARE total_price DECIMAL(10,2);
```



```
    SELECT SUM(price) INTO total_price FROM books;
```



```
    SELECT total_price AS original_total,
```



```
           CONST_DISCOUNT AS discount,
```



```
           (total_price - CONST_DISCOUNT) AS discounted_total;
```



```
END //
```



```
DELIMITER ;
```

SCREENSHOT:

<input type="checkbox"/> Show all	Number of rows:	25 ▾	Filter rows:	<input type="text" value="Search this table"/>
Extra options				
original_total	discount	discounted_total		
7675.00	50.00	7625.00		
<input type="checkbox"/> Show all	Number of rows:	25 ▾	Filter rows:	<input type="text" value="Search this table"/>
Query results operations				
Print	Copy to clipboard	Create view		

QUESTION:

Lab 3: Write a PL/SQL block using IF-THEN-ELSE to check if a book's price is above \$100 and print a message accordingly.

CODE:

```
DELIMITER //
```

```
CREATE PROCEDURE checkBookPrice(IN bid INT)
```

```
BEGIN
```

```
    DECLARE book_price DECIMAL(10,2);
```

```
    SELECT price INTO book_price FROM books WHERE book_id = bid;
```

```
    IF book_price > 100 THEN
```

```
        SELECT CONCAT('Book ID ', bid, ' has a price above $100') AS message;
```

```
    ELSE
```

```
        SELECT CONCAT('Book ID ', bid, ' has a price $100 or below') AS message;
```

```
    END IF;
```

```
END //
```

```
DELIMITER ;
```

SCREENSHOT:

The screenshot displays a database query result interface. At the top, there is a control bar with a 'Show all' checkbox, 'Number of rows: 25' (with a dropdown arrow), and a 'Filter rows: Search this table' input field. Below this is an 'Extra options' button. The main content area shows a table with one row. The column header is 'message' in bold. The row content is 'Book ID 3 has a price \$100 or below'. Below the table, there is another control bar identical to the one above. At the bottom, there is a 'Query results operations' section with three buttons: 'Print' (with a printer icon), 'Copy to clipboard' (with a clipboard icon), and 'Create view' (with a document icon).

QUESTION:

Lab 4: Use a FOR LOOP in PL/SQL to display the details of all books one by one.

CODE:

```
DELIMITER //

CREATE PROCEDURE displayBooksForLoop()

BEGIN

    DECLARE done INT DEFAULT 0;

    DECLARE v_book_id INT;

    DECLARE v_title VARCHAR(255);

    DECLARE v_author VARCHAR(100);

    DECLARE v_publisher VARCHAR(100);

    DECLARE v_year INT;

    DECLARE v_price DECIMAL(10,2);

    DECLARE v_genre VARCHAR(50);

    DECLARE cur_books CURSOR FOR

        SELECT book_id, title, author, publisher, year_of_publication, price, genre FROM books;

    DECLARE CONTINUE HANDLER FOR NOT FOUND SET done = 1;

    OPEN cur_books;

read_loop: LOOP

        FETCH cur_books INTO v_book_id, v_title, v_author, v_publisher, v_year, v_price,
v_genre;

        IF done THEN

            LEAVE read_loop;

        END IF;

        SELECT v_book_id AS book_id, v_title AS title, v_author AS author, v_publisher AS
publisher, v_year AS year_of_publication, v_price AS price, v_genre AS genre;

    END LOOP;

    CLOSE cur_books;

END //DELIMITER ;
```

SCREENSHOT:

```
CALL `displayBooksForLoop`();
```

Execution results of routine `displayBooksForLoop`

book_id	title	author	publisher	year_of_publication	price	genre
1	Mathematics Basics	John Doe	EduPub	2015	150.00	Education

book_id	title	author	publisher	year_of_publication	price	genre
2	Physics Fundamentals	Jane Smith	SciencePub	2018	200.00	Science

book_id	title	author	publisher	year_of_publication	price	genre
3	Chemistry 101	Alice Brown	ChemBooks	2017	120.00	Science

book_id	title	author	publisher	year_of_publication	price	genre
4	Programming in C	Robert Martin	TechPress	2020	300.00	Programming

book_id	title	author	publisher	year_of_publication	price	genre
5	English Grammar	Emily White	LangPub	2016	100.00	Language

QUESTION:

Lab 3: Write a PL/SQL block using an explicit cursor to fetch and display all records from the members table.

CODE:

```
DELIMITER //
```

```
CREATE PROCEDURE displayMembers()
```

```
BEGIN
```

```
    DECLARE done INT DEFAULT 0;
```

```
    DECLARE v_member_id INT;
```

```
    DECLARE v_member_name VARCHAR(100);
```

```
    DECLARE v_date_of_membership DATE;
```

```
    DECLARE v_email VARCHAR(100);
```

```
    DECLARE cur_members CURSOR FOR
```

```
        SELECT member_id, member_name, date_of_membership, email FROM members;
```

```
    DECLARE CONTINUE HANDLER FOR NOT FOUND SET done = 1;
```

```

OPEN cur_members;

read_loop: LOOP

    FETCH cur_members INTO v_member_id, v_member_name, v_date_of_membership,
v_email;

    IF done THEN

        LEAVE read_loop;

    END IF;

    SELECT v_member_id AS member_id, v_member_name AS member_name,
v_date_of_membership AS date_of_membership, v_email AS email;

    END LOOP;

CLOSE cur_members;

END //

DELIMITER ;

```

SCREENSHOT:

Execution results of routine `displayMembers`			
member_id	member_name	date_of_membership	email
1	Rahul S.	2022-01-15	rahul.sharma@example.com
member_id	member_name	date_of_membership	email
2	Priya Patel	2021-12-20	new.priya@example.com
member_id	member_name	date_of_membership	email
3	Amit Kumar	2023-03-05	amit.kumar@example.com
member_id	member_name	date_of_membership	email
4	Sneha Mehta	2022-07-10	sneha.mehta@example.com
member_id	member_name	date_of_membership	email
5	Karan Joshi	2023-01-25	karan.joshi@example.com

QUESTION:

Lab 4: Create a cursor to retrieve books by a particular author and display their titles.

CODE:

```
DELIMITER //

CREATE PROCEDURE getBooksByAuthorCursor(IN authorName VARCHAR(100))
BEGIN
    DECLARE done INT DEFAULT 0;
    DECLARE v_title VARCHAR(255);
    DECLARE cur_books CURSOR FOR
        SELECT title FROM books WHERE author = authorName;
    DECLARE CONTINUE HANDLER FOR NOT FOUND SET done = 1;

    OPEN cur_books;

read_loop: LOOP
    FETCH cur_books INTO v_title;
    IF done THEN
        LEAVE read_loop;
    END IF;
    SELECT v_title AS title;
END LOOP;

CLOSE cur_books;

END //

DELIMITER ;
```

SCREENSHOT:

title
Mathematics Basics

QUESTION:

Lab 3: Perform a transaction that includes inserting a new member, setting a SAVEPOINT, and rolling back to the savepoint after making updates.

CODE:

```
START TRANSACTION;

INSERT INTO members (member_id, member_name, date_of_membership, email)
VALUES (6, 'Amit Sharma', '2023-05-10', 'amit.sharma@example.com');

SAVEPOINT sp_before_update;

UPDATE members
SET member_name = 'Amit S.'
WHERE member_id = 6;

UPDATE members
SET email = 'amit.new@example.com'
WHERE member_id = 6;

ROLLBACK TO SAVEPOINT sp_before_update;

COMMIT;
```

SCREENSHOT:



Click the drop-down arrow to toggle column's visibility.

	member_id	member_name	date_of_membership	email
<input type="checkbox"/> Edit	1	Rahul S.	2022-01-15	rahul.sharma@example.com
<input type="checkbox"/> Edit Copy Delete	2	Priya Patel	2021-12-20	new.priya@example.com
<input type="checkbox"/> Edit Copy Delete	3	Amit Kumar	2023-03-05	amit.kumar@example.com
<input type="checkbox"/> Edit Copy Delete	4	Sneha Mehta	2022-07-10	sneha.mehta@example.com
<input type="checkbox"/> Edit Copy Delete	5	Karan Joshi	2023-01-25	karan.joshi@example.com
<input type="checkbox"/> Edit Copy Delete	6	Amit Sharma	2023-05-10	amit.sharma@example.com

QUESTION:

Lab 4: Use COMMIT after successfully inserting multiple books into the books table, then use ROLLBACK to undo a set of changes made after a savepoint.

CODE:

```
START TRANSACTION;

INSERT INTO books (book_id,title,author,publisher,year_of_publication,price,genre)
VALUES
(20,'Machine Learning','John Smith','TechPress',2022,400.00,'Programming'),
(21,'Artificial Intelligence','Jane Doe','AI Pub',2021,350.00,'Programming'),
(22,'Big Data Analytics','Alice Brown','DataPub',2020,300.00,'Data Science');

COMMIT;

START TRANSACTION;















































SAVEPOINT sp_before_update;

UPDATE books
SET price = price + 50
WHERE book_id IN (20,21);

ROLLBACK TO SAVEPOINT sp_before_update;

COMMIT;
```

SCREENSHOT:

<input type="checkbox"/>	 Edit	 Copy	 Delete	1	Mathematics Basics	John Doe	EduPub		2015	150.00	Education
<input type="checkbox"/>	 Edit	 Copy	 Delete	2	Physics Fundamentals	Jane Smith	SciencePub		2018	200.00	Science
<input type="checkbox"/>	 Edit	 Copy	 Delete	3	Chemistry 101	Alice Brown	ChemBooks		2017	120.00	Science
<input type="checkbox"/>	 Edit	 Copy	 Delete	4	Programming in C	Robert Martin	TechPress		2020	300.00	Programming
<input type="checkbox"/>	 Edit	 Copy	 Delete	5	English Grammar	Emily White	LangPub		2016	100.00	Language
<input type="checkbox"/>	 Edit	 Copy	 Delete	11	Data Structures	Alice Brown	TechPub		2021	250.00	Programming
<input type="checkbox"/>	 Edit	 Copy	 Delete	12	Algorithms	Bob Smith	TechPub		2020	300.00	Programming
<input type="checkbox"/>	 Edit	 Copy	 Delete	13	Database Systems	Carol White	EduPub		2019	200.00	Education
<input type="checkbox"/>	 Edit	 Copy	 Delete	14	Data Structures	Alice Brown	TechPub		2021	250.00	Programming
<input type="checkbox"/>	 Edit	 Copy	 Delete	15	Algorithms	Bob Smith	TechPub		2020	300.00	Programming
<input type="checkbox"/>	 Edit	 Copy	 Delete	16	Database Systems	Carol White	EduPub		2019	200.00	Education
<input type="checkbox"/>	 Edit	 Copy	 Delete	17	Data Structures	Alice Brown	TechPub		2021	250.00	Programming
<input type="checkbox"/>	 Edit	 Copy	 Delete	18	Algorithms	Bob Smith	TechPub		2020	300.00	Programming
<input type="checkbox"/>	 Edit	 Copy	 Delete	19	Database Systems	Carol White	EduPub		2019	200.00	Education
<input type="checkbox"/>	 Edit	 Copy	 Delete	20	Machine Learning	John Smith	TechPress		2022	400.00	Programming
<input type="checkbox"/>	 Edit	 Copy	 Delete	21	Artificial Intelligence	Jane Doe	AI Pub		2021	350.00	Programming
<input type="checkbox"/>	 Edit	 Copy	 Delete	22	Big Data Analytics	Alice Brown	DataPub		2020	300.00	Data Science