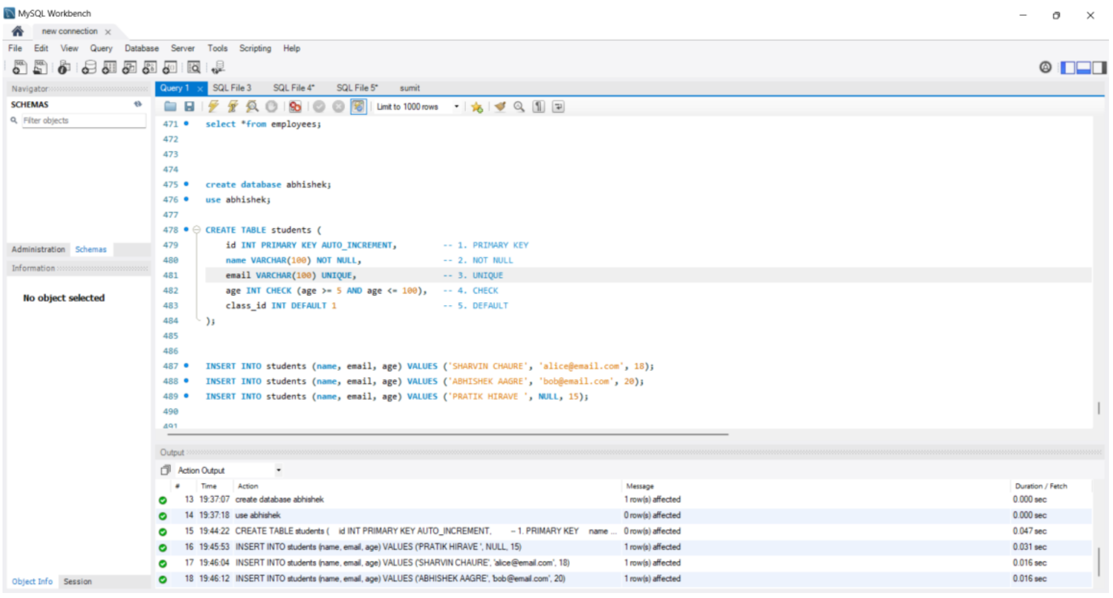
NAME : SHARVIN CHAURE

PRN : 2124UCSM1011

DEP : CYBER SECURITY.

Install and set up MySQL. Create a database and Perform basic operations like INSERT & DELETE

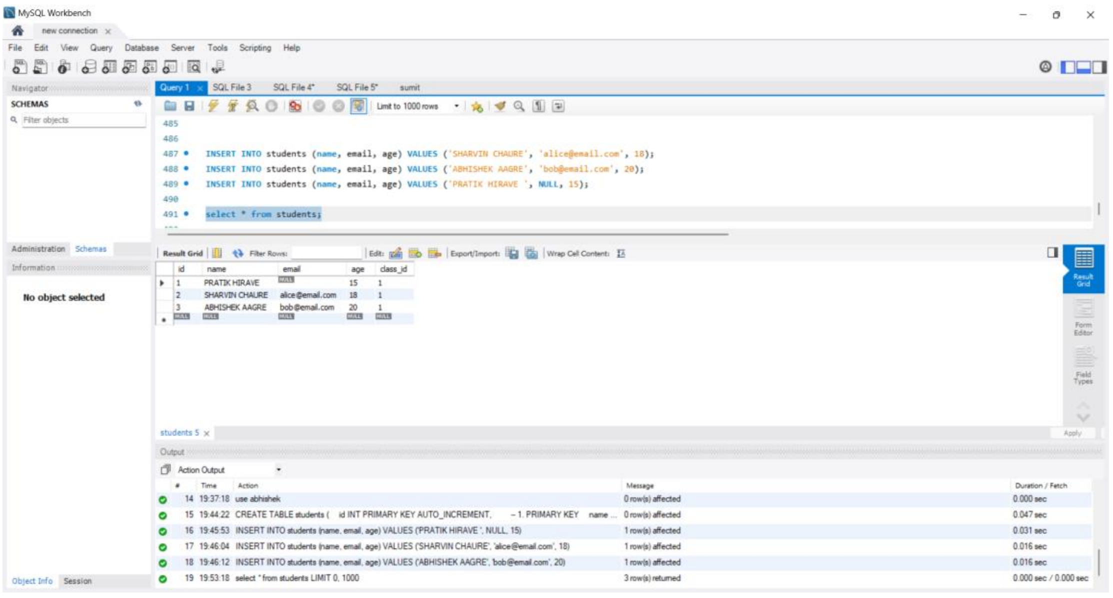
```
create database abhishek;
use abhishek;

CREATE TABLE students (
    id INT PRIMARY KEY AUTO_INCREMENT,        -- 1. PRIMARY KEY
    name VARCHAR(100) NOT NULL,              -- 2. NOT NULL
    email VARCHAR(100) UNIQUE,               -- 3. UNIQUE
    age INT CHECK (age >= 5 AND age <= 100),   -- 4. CHECK
    class_id INT DEFAULT 1                   -- 5. DEFAULT
);


INSERT INTO students (name, email, age) VALUES ('SHARVIN CHAURE', 'alice@email.com', 18);
INSERT INTO students (name, email, age) VALUES ('ABHISHEK AAGRE', 'bob@email.com', 20);
INSERT INTO students (name, email, age) VALUES ('PRATIK HIRAVE ', NULL, 15);
```



```sql
select *from employees;



create database abhishek;
use abhishek;

CREATE TABLE students (
    id INT PRIMARY KEY AUTO_INCREMENT,          -- 1. PRIMARY KEY
    name VARCHAR(100) NOT NULL,                 -- 2. NOT NULL
    email VARCHAR(100) UNIQUE,                  -- 3. UNIQUE
    age INT CHECK (age >= 5 AND age <= 100),    -- 4. CHECK
    class_id INT DEFAULT 1                      -- 5. DEFAULT
);


INSERT INTO students (name, email, age) VALUES ('SHARVIN CHAURE', 'alice@email.com', 18);
INSERT INTO students (name, email, age) VALUES ('ABHISHEK AAGRE', 'bob@email.com', 20);
INSERT INTO students (name, email, age) VALUES ('PRATIK HIRAVE ', NULL, 15);
```

```
#   Time      Action                                                                           Message            Duration / Fetch
13  19:37:07  create database abhishek                                                         1 row(s) affected  0.000 sec
14  19:37:18  use abhishek                                                                     0 row(s) affected  0.000 sec
15  19:44:22  CREATE TABLE students (   id INT PRIMARY KEY AUTO_INCREMENT,   -- 1. PRIMARY KEY   name ...  0 row(s) affected  0.047 sec
16  19:45:53  INSERT INTO students (name, email, age) VALUES ('PRATIK HIRAVE ', NULL, 15)           1 row(s) affected  0.031 sec
17  19:46:04  INSERT INTO students (name, email, age) VALUES ('SHARVIN CHAURE', 'alice@email.com', 18)  1 row(s) affected  0.016 sec
18  19:46:12  INSERT INTO students (name, email, age) VALUES ('ABHISHEK AAGRE', 'bob@email.com', 20)    1 row(s) affected  0.016 sec
```

Select all data from the table.
select * from students;

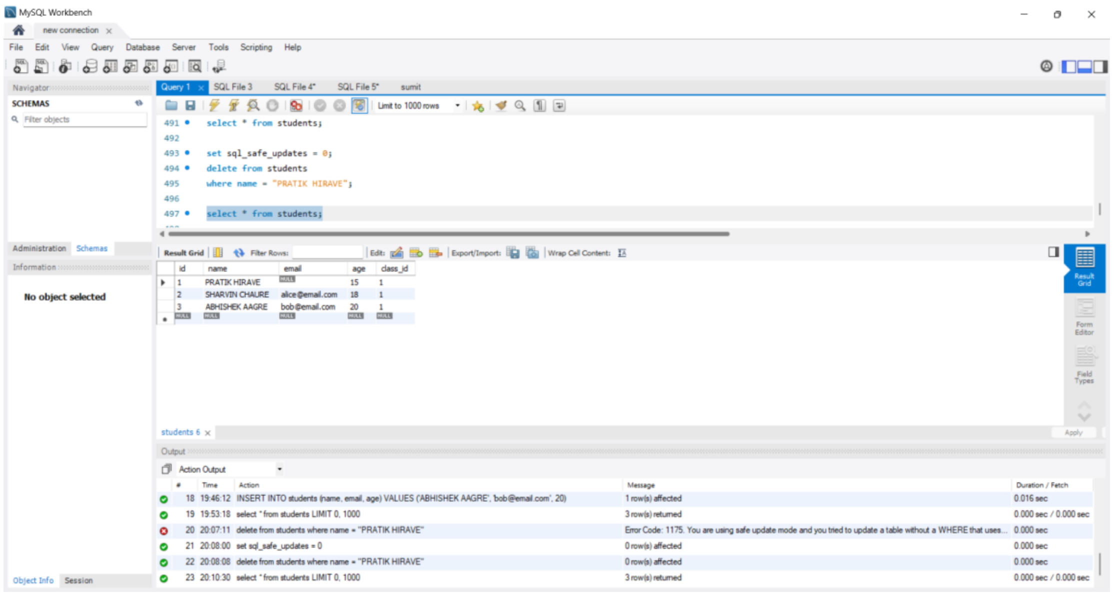


```sql
INSERT INTO students (name, email, age) VALUES ('SHARVIN CHAURE', 'alice@email.com', 18);
INSERT INTO students (name, email, age) VALUES ('ABHISHEK AAGRE', 'bob@email.com', 20);
INSERT INTO students (name, email, age) VALUES ('PRATIK HIRAVE ', NULL, 15);

select * from students;
```

id	name	email	age	class_id
1	PRATIK HIRAVE	NULL	15	1
2	SHARVIN CHAURE	alice@email.com	18	1
3	ABHISHEK AAGRE	bob@email.com	20	1
NULL	NULL	NULL	NULL	NULL

```
#   Time      Action                                                                           Message            Duration / Fetch
14  19:37:18  use abhishek                                                                     0 row(s) affected  0.000 sec
15  19:44:22  CREATE TABLE students (   id INT PRIMARY KEY AUTO_INCREMENT,   -- 1. PRIMARY KEY   name ...  0 row(s) affected  0.047 sec
16  19:45:53  INSERT INTO students (name, email, age) VALUES ('PRATIK HIRAVE ', NULL, 15)           1 row(s) affected  0.031 sec
17  19:46:04  INSERT INTO students (name, email, age) VALUES ('SHARVIN CHAURE', 'alice@email.com', 18)  1 row(s) affected  0.016 sec
18  19:46:12  INSERT INTO students (name, email, age) VALUES ('ABHISHEK AAGRE', 'bob@email.com', 20)    1 row(s) affected  0.016 sec
19  19:53:18  select * from students LIMIT 0, 1000                                             3 row(s) returned  0.000 sec / 0.000 sec
```

Delete data from student:
delete from students
where name = "PRATIK HIRAVE";



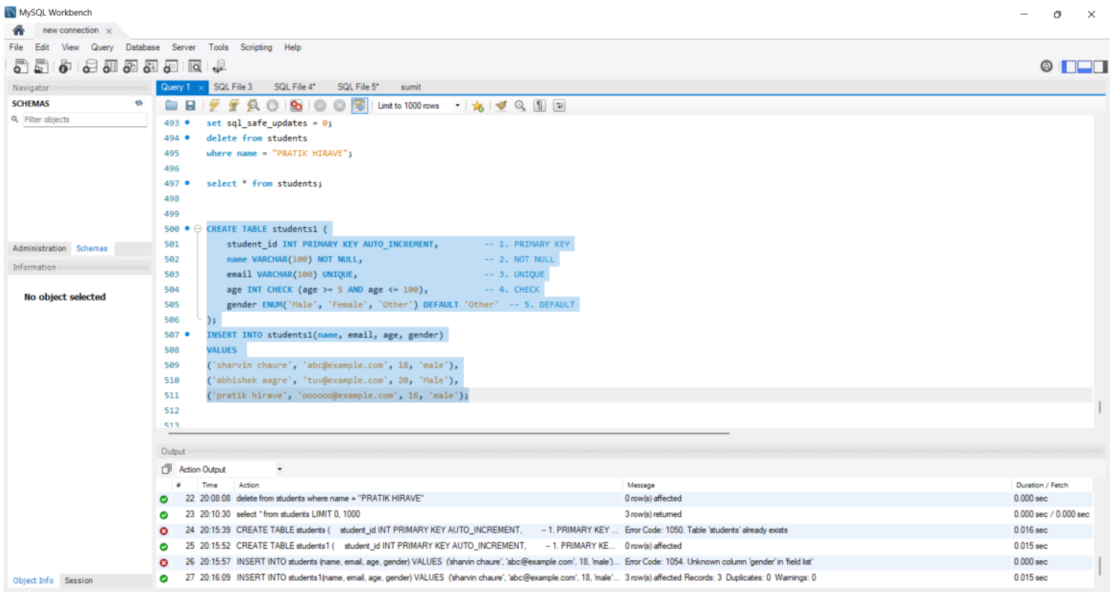
```
select * from students;

set sql_safe_updates = 0;
delete from students
where name = "PRATIK HIRAVE";

select * from students;
```

id	name	email	age	class_id
1	PRATIK HIRAVE	NULL	15	1
2	SHARVIN CHAURE	alice@email.com	18	1
3	ABHISHEK AAGRE	bob@email.com	20	1
NULL	NULL	NULL	NULL	NULL

```
#   Time      Action                                                                          Message                                                                                      Duration / Fetch
18  19:46:12  INSERT INTO students (name, email, age) VALUES ('ABHISHEK AAGRE', 'bob@email.com', 20)  1 row(s) affected                                                                            0.016 sec
19  19:53:18  select * from students LIMIT 0, 1000                                            3 row(s) returned                                                                            0.000 sec / 0.000 sec
20  20:07:11  delete from students where name = "PRATIK HIRAVE"                               Error Code: 1175. You are using safe update mode and you tried to update a table without a WHERE that uses...  0.000 sec
21  20:08:00  set sql_safe_updates = 0                                                        0 row(s) affected                                                                            0.000 sec
22  20:08:08  delete from students where name = "PRATIK HIRAVE"                               0 row(s) affected                                                                            0.000 sec
23  20:10:30  select * from students LIMIT 0, 1000                                            3 row(s) returned                                                                            0.000 sec / 0.000 sec
```

2 Create a table for storing student information. Insert sample data and perform basic operations: INSERT, UPDATE, DELETE, and SELECT.

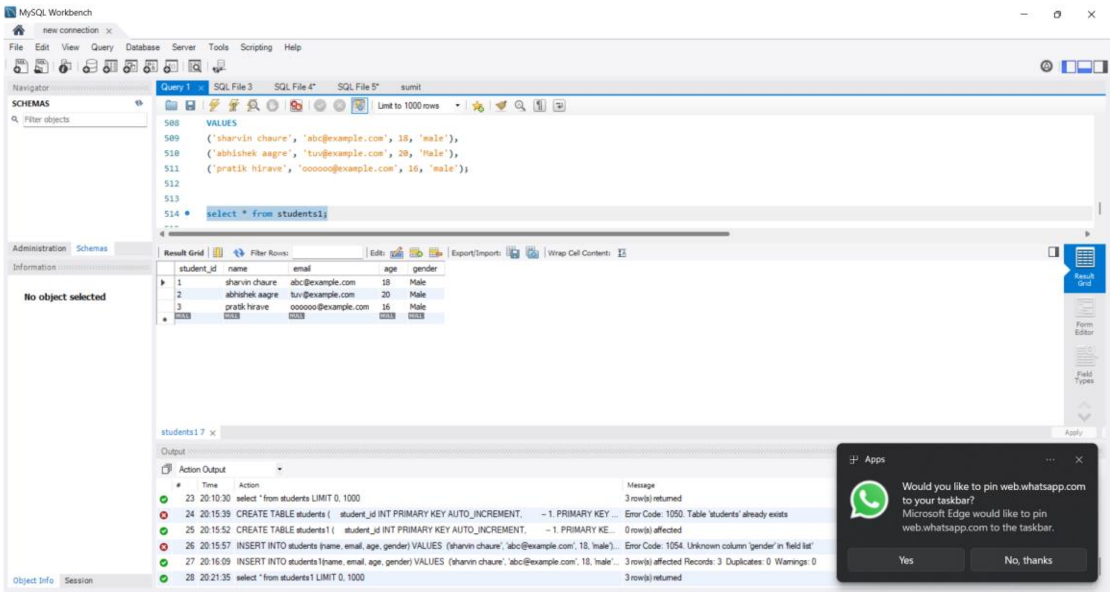
```
CREATE TABLE students1 (
    student_id INT PRIMARY KEY AUTO_INCREMENT,        -- 1. PRIMARY KEY
    name VARCHAR(100) NOT NULL,                        -- 2. NOT NULL
    email VARCHAR(100) UNIQUE,                         -- 3. UNIQUE
    age INT CHECK (age >= 5 AND age <= 100),           -- 4. CHECK
    gender ENUM('Male', 'Female', 'Other') DEFAULT 'Other'  -- 5. DEFAULT
);
INSERT INTO students1(name, email, age, gender)
VALUES
('sharvin chaure', 'abc@example.com', 18, 'male'),
('abhishek aagre', 'tuv@example.com', 20, 'Male'),
('pratik hirave', 'oooooo@example.com', 16, 'male');
```



```
set sql_safe_updates = 0;
delete from students
where name = "PRATIK HIRAVE";

select * from students;


CREATE TABLE students1 (
    student_id INT PRIMARY KEY AUTO_INCREMENT,        -- 1. PRIMARY KEY
    name VARCHAR(100) NOT NULL,                       -- 2. NOT NULL
    email VARCHAR(100) UNIQUE,                        -- 3. UNIQUE
    age INT CHECK (age >= 5 AND age <= 100),          -- 4. CHECK
    gender ENUM('Male', 'Female', 'Other') DEFAULT 'Other'  -- 5. DEFAULT
);
INSERT INTO students1(name, email, age, gender)
VALUES
('sharvin chaure', 'abc@example.com', 18, 'male'),
('abhishek aagre', 'tuv@example.com', 20, 'Male'),
('pratik hirave', 'oooooo@example.com', 16, 'male');
```

```
#   Time      Action                                                                                          Message                                                        Duration / Fetch
22  20:08:08  delete from students where name = "PRATIK HIRAVE"                                               0 row(s) affected                                              0.000 sec
23  20:10:30  select * from students LIMIT 0, 1000                                                             3 row(s) returned                                              0.000 sec / 0.000 sec
24  20:15:39  CREATE TABLE students (    student_id INT PRIMARY KEY AUTO_INCREMENT,       -- 1. PRIMARY KEY ...  Error Code: 1050. Table 'students' already exists             0.016 sec
25  20:15:52  CREATE TABLE students1 (    student_id INT PRIMARY KEY AUTO_INCREMENT,       -- 1. PRIMARY KE...   0 row(s) affected                                              0.015 sec
26  20:15:57  INSERT INTO students (name, email, age, gender) VALUES  ('sharvin chaure', 'abc@example.com', 18, 'male')...  Error Code: 1054. Unknown column 'gender' in 'field list'  0.000 sec
27  20:16:09  INSERT INTO students1(name, email, age, gender) VALUES  ('sharvin chaure', 'abc@example.com', 18, 'male'...  3 row(s) affected Records: 3  Duplicates: 0  Warnings: 0  0.015 sec
```

Select ALL DATA FROM THE TABLE
select * from students1;



```
VALUES
('sharvin chaure', 'abc@example.com', 18, 'male'),
('abhishek aagre', 'tuv@example.com', 20, 'Male'),
('pratik hirave', 'oooooo@example.com', 16, 'male');


select * from students1;
```

student_id	name	email	age	gender
1	sharvin chaure	abc@example.com	18	Male
2	abhishek aagre	tuv@example.com	20	Male
3	pratik hirave	oooooo@example.com	16	Male
NULL	NULL	NULL	NULL	NULL

```
#   Time      Action                                                                                          Message
23  20:10:30  select * from students LIMIT 0, 1000                                                             3 row(s) returned
24  20:15:39  CREATE TABLE students (    student_id INT PRIMARY KEY AUTO_INCREMENT,       -- 1. PRIMARY KEY ...  Error Code: 1050. Table 'students' already exists
25  20:15:52  CREATE TABLE students1 (    student_id INT PRIMARY KEY AUTO_INCREMENT,       -- 1. PRIMARY KE...   0 row(s) affected
26  20:15:57  INSERT INTO students (name, email, age, gender) VALUES  ('sharvin chaure', 'abc@example.com', 18, 'male')...  Error Code: 1054. Unknown column 'gender' in 'field list'
27  20:16:09  INSERT INTO students1(name, email, age, gender) VALUES  ('sharvin chaure', 'abc@example.com', 18, 'male'...  3 row(s) affected Records: 3  Duplicates: 0  Warnings: 0
28  20:21:35  select * from students1 LIMIT 0, 1000                                                            3 row(s) returned
```

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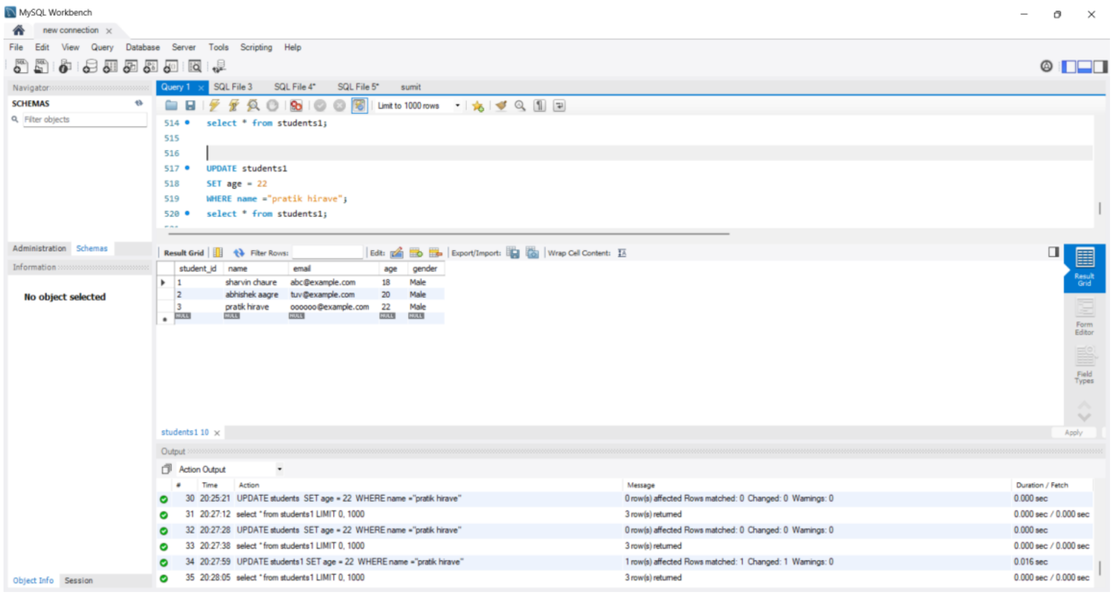
Update the table:
UPDATE students
SET age = 22
WHERE name ="pratik hirave";

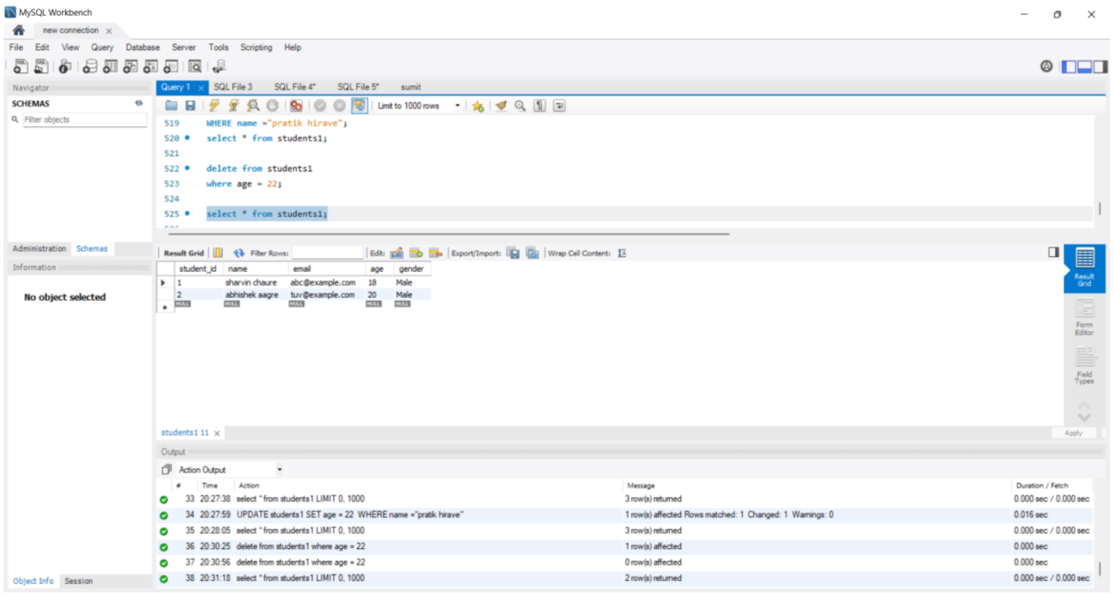


```sql
select * from students1;


UPDATE students1
SET age = 22
WHERE name ="pratik hirave";
select * from students1;
```

student_id	name	email	age	gender
1	sharvin chaure	abc@example.com	18	Male
2	abhishek aagre	tuv@example.com	20	Male
3	pratik hirave	oooooo@example.com	22	Male
NULL	NULL	NULL	NULL	NULL

```
#   Time      Action                                                  Message                                                    Duration / Fetch
30  20:25:21  UPDATE students  SET age = 22  WHERE name ="pratik hirave"  0 row(s) affected Rows matched: 0  Changed: 0  Warnings: 0  0.000 sec
31  20:27:12  select * from students1 LIMIT 0, 1000                  3 row(s) returned                                          0.000 sec / 0.000 sec
32  20:27:28  UPDATE students  SET age = 22  WHERE name ="pratik hirave"  0 row(s) affected Rows matched: 0  Changed: 0  Warnings: 0  0.000 sec
33  20:27:38  select * from students1 LIMIT 0, 1000                  3 row(s) returned                                          0.000 sec / 0.000 sec
34  20:27:59  UPDATE students1 SET age = 22  WHERE name ="pratik hirave"  1 row(s) affected Rows matched: 1  Changed: 1  Warnings: 0  0.016 sec
35  20:28:05  select * from students1 LIMIT 0, 1000                  3 row(s) returned                                          0.000 sec / 0.000 sec
```

Delete values from the table.
delete from students1
where age = 22;



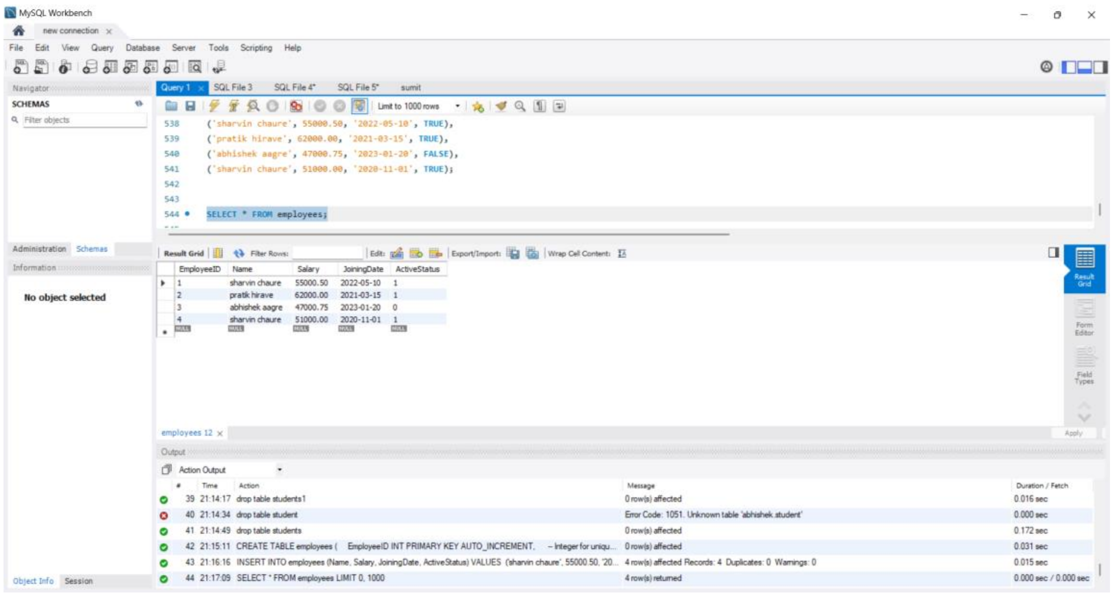
```sql
WHERE name ="pratik hirave";
select * from students1;

delete from students1
where age = 22;

select * from students1;
```

student_id	name	email	age	gender
1	sharvin chaure	abc@example.com	18	Male
2	abhishek aagre	tuv@example.com	20	Male
NULL	NULL	NULL	NULL	NULL

```
#   Time      Action                                                  Message                                                    Duration / Fetch
33  20:27:38  select * from students1 LIMIT 0, 1000                  3 row(s) returned                                          0.000 sec / 0.000 sec
34  20:27:59  UPDATE students1 SET age = 22  WHERE name ="pratik hirave"  1 row(s) affected Rows matched: 1  Changed: 1  Warnings: 0  0.016 sec
35  20:28:05  select * from students1 LIMIT 0, 1000                  3 row(s) returned                                          0.000 sec / 0.000 sec
36  20:30:25  delete from students1 where age = 22                   1 row(s) affected                                          0.000 sec
37  20:30:56  delete from students1 where age = 22                   0 row(s) affected                                          0.000 sec
38  20:31:18  select * from students1 LIMIT 0, 1000                  2 row(s) returned                                          0.000 sec / 0.000 sec
```

3 . Create a table with columns for EmployeeID, Name, Salary, JoiningDate, and
ActiveStatus using different data types. Insert sample data and perform queries to
manipulate and retrieve data.

Show the all table.
SELECT * FROM employees;



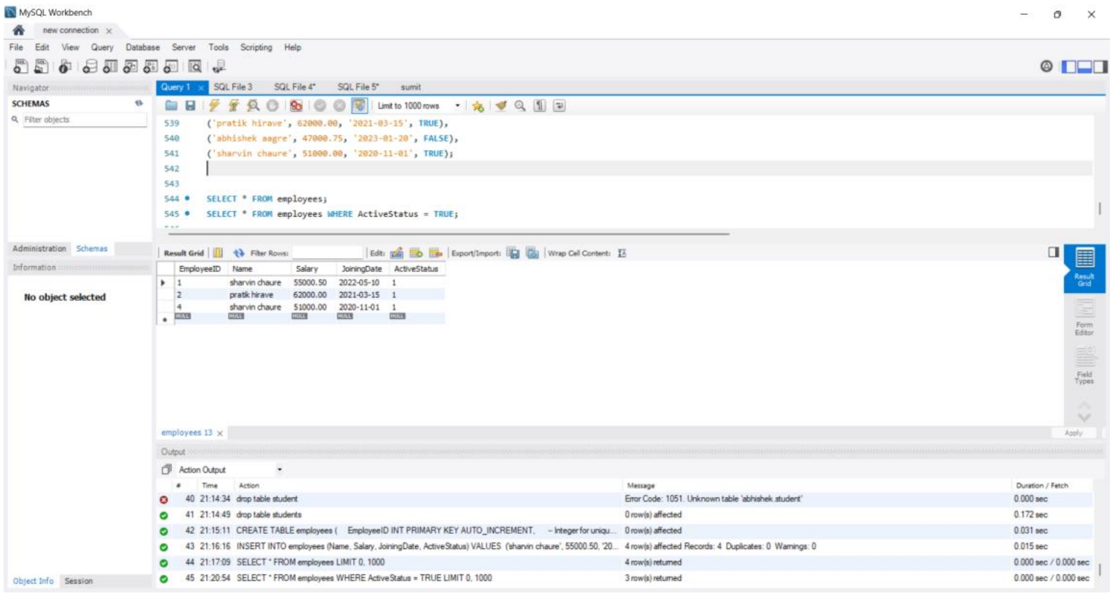
```
('sharvin chaure', 55000.50, '2022-05-10', TRUE),
('pratik hirave', 62000.00, '2021-03-15', TRUE),
('abhishek aagre', 47000.75, '2023-01-20', FALSE),
('sharvin chaure', 51000.00, '2020-11-01', TRUE);


SELECT * FROM employees;
```

EmployeeID	Name	Salary	JoiningDate	ActiveStatus
1	sharvin chaure	55000.50	2022-05-10	1
2	pratik hirave	62000.00	2021-03-15	1
3	abhishek aagre	47000.75	2023-01-20	0
4	sharvin chaure	51000.00	2020-11-01	1
NULL	NULL	NULL	NULL	NULL

```
#   Time      Action                                                                                  Message                                                  Duration / Fetch
39  21:14:17  drop table students1                                                                    0 row(s) affected                                        0.016 sec
40  21:14:34  drop table student                                                                      Error Code: 1051. Unknown table 'abhishek.student'       0.000 sec
41  21:14:49  drop table students                                                                     0 row(s) affected                                        0.172 sec
42  21:15:11  CREATE TABLE employees (    EmployeeID INT PRIMARY KEY AUTO_INCREMENT,    -- Integer for uniqu...   0 row(s) affected                    0.031 sec
43  21:16:16  INSERT INTO employees (Name, Salary, JoiningDate, ActiveStatus) VALUES ('sharvin chaure', 55000.50, '20...   4 row(s) affected Records: 4  Duplicates: 0  Warnings: 0   0.015 sec
44  21:17:09  SELECT * FROM employees LIMIT 0, 1000                                                   4 row(s) returned                                        0.000 sec / 0.000 sec
```

SELECT Filter by Active Employees

SELECT * FROM employees WHERE ActiveStatus = TRUE;



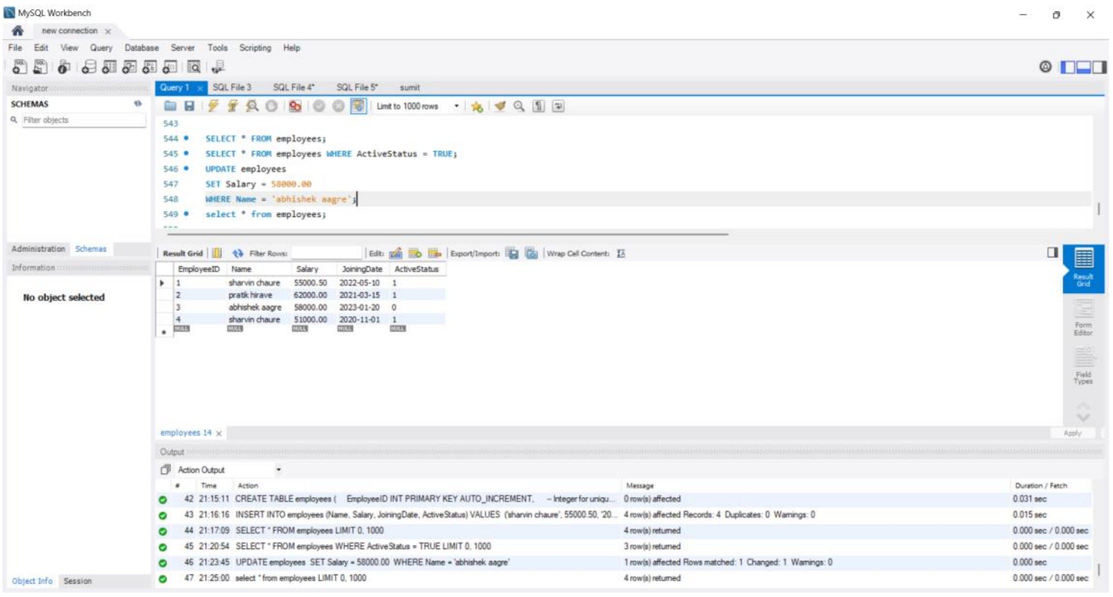
```
('pratik hirave', 62000.00, '2021-03-15', TRUE),
('abhishek aagre', 47000.75, '2023-01-20', FALSE),
('sharvin chaure', 51000.00, '2020-11-01', TRUE);


SELECT * FROM employees;
SELECT * FROM employees WHERE ActiveStatus = TRUE;
```

EmployeeID	Name	Salary	JoiningDate	ActiveStatus
1	sharvin chaure	55000.50	2022-05-10	1
2	pratik hirave	62000.00	2021-03-15	1
4	sharvin chaure	51000.00	2020-11-01	1
NULL	NULL	NULL	NULL	NULL

```
#   Time      Action                                                                                  Message                                                  Duration / Fetch
40  21:14:34  drop table student                                                                      Error Code: 1051. Unknown table 'abhishek.student'       0.000 sec
41  21:14:49  drop table students                                                                     0 row(s) affected                                        0.172 sec
42  21:15:11  CREATE TABLE employees (    EmployeeID INT PRIMARY KEY AUTO_INCREMENT,    -- Integer for uniqu...   0 row(s) affected                    0.031 sec
43  21:16:16  INSERT INTO employees (Name, Salary, JoiningDate, ActiveStatus) VALUES ('sharvin chaure', 55000.50, '20...   4 row(s) affected Records: 4  Duplicates: 0  Warnings: 0   0.015 sec
44  21:17:09  SELECT * FROM employees LIMIT 0, 1000                                                   4 row(s) returned                                        0.000 sec / 0.000 sec
45  21:20:54  SELECT * FROM employees WHERE ActiveStatus = TRUE LIMIT 0, 1000                         3 row(s) returned                                        0.000 sec / 0.000 sec
```

UPDATE (Change Salary)

UPDATE employees SET Salary = 58000.00 WHERE Name = ’abhishek aagre’;



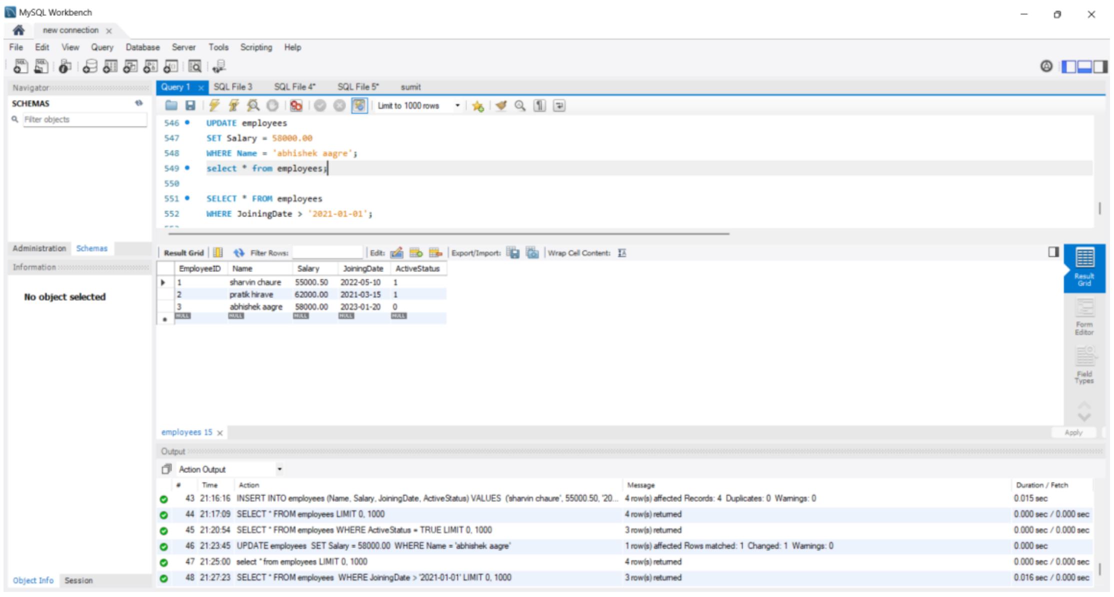
```
SELECT * FROM employees;
SELECT * FROM employees WHERE ActiveStatus = TRUE;
UPDATE employees
SET Salary = 58000.00
WHERE Name = 'abhishek aagre';
select * from employees;
```

	EmployeeID	Name	Salary	JoiningDate	ActiveStatus
▶	1	sharvin chaure	55000.50	2022-05-10	1
	2	pratik hirave	62000.00	2021-03-15	1
	3	abhishek aagre	58000.00	2023-01-20	0
	4	sharvin chaure	51000.00	2020-11-01	1
*	NULL	NULL	NULL	NULL	NULL

	#	Time	Action	Message	Duration / Fetch
✓	42	21:15:11	CREATE TABLE employees (EmployeeID INT PRIMARY KEY AUTO_INCREMENT, -- Integer for uniqu...	0 row(s) affected	0.031 sec
✓	43	21:16:16	INSERT INTO employees (Name, Salary, JoiningDate, ActiveStatus) VALUES ('sharvin chaure', 55000.50, '20...	4 row(s) affected Records: 4 Duplicates: 0 Warnings: 0	0.015 sec
✓	44	21:17:09	SELECT * FROM employees LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
✓	45	21:20:54	SELECT * FROM employees WHERE ActiveStatus = TRUE LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec
✓	46	21:23:45	UPDATE employees SET Salary = 58000.00 WHERE Name = 'abhishek aagre'	1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0	0.000 sec
✓	47	21:25:00	select * from employees LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec

SELECT (Employees who joined after 2021)

SELECT * FROM employees WHERE JoiningDate > ’2021-01-01’;



```
UPDATE employees
SET Salary = 58000.00
WHERE Name = 'abhishek aagre';
select * from employees;

SELECT * FROM employees
WHERE JoiningDate > '2021-01-01';
```

EmployeeID	Name	Salary	JoiningDate	ActiveStatus
1	sharvin chaure	55000.50	2022-05-10	1
2	pratik hirave	62000.00	2021-03-15	1
3	abhishek aagre	58000.00	2023-01-20	0
NULL	NULL	NULL	NULL	NULL

```
#   Time      Action                                                                                          Message                                                        Duration / Fetch
43  21:16:16  INSERT INTO employees (Name, Salary, JoiningDate, ActiveStatus) VALUES ('sharvin chaure', 55000.50, '20...  4 row(s) affected Records: 4  Duplicates: 0  Warnings: 0   0.015 sec
44  21:17:09  SELECT * FROM employees LIMIT 0, 1000                                                                   4 row(s) returned                                              0.000 sec / 0.000 sec
45  21:20:54  SELECT * FROM employees WHERE ActiveStatus = TRUE LIMIT 0, 1000                                         3 row(s) returned                                              0.000 sec / 0.000 sec
46  21:23:45  UPDATE employees  SET Salary = 58000.00  WHERE Name = 'abhishek aagre'                                  1 row(s) affected Rows matched: 1  Changed: 1  Warnings: 0    0.000 sec
47  21:25:00  select * from employees LIMIT 0, 1000                                                                   4 row(s) returned                                              0.000 sec / 0.000 sec
48  21:27:23  SELECT * FROM employees  WHERE JoiningDate > '2021-01-01' LIMIT 0, 1000                                 3 row(s) returned                                              0.016 sec / 0.000 sec
```

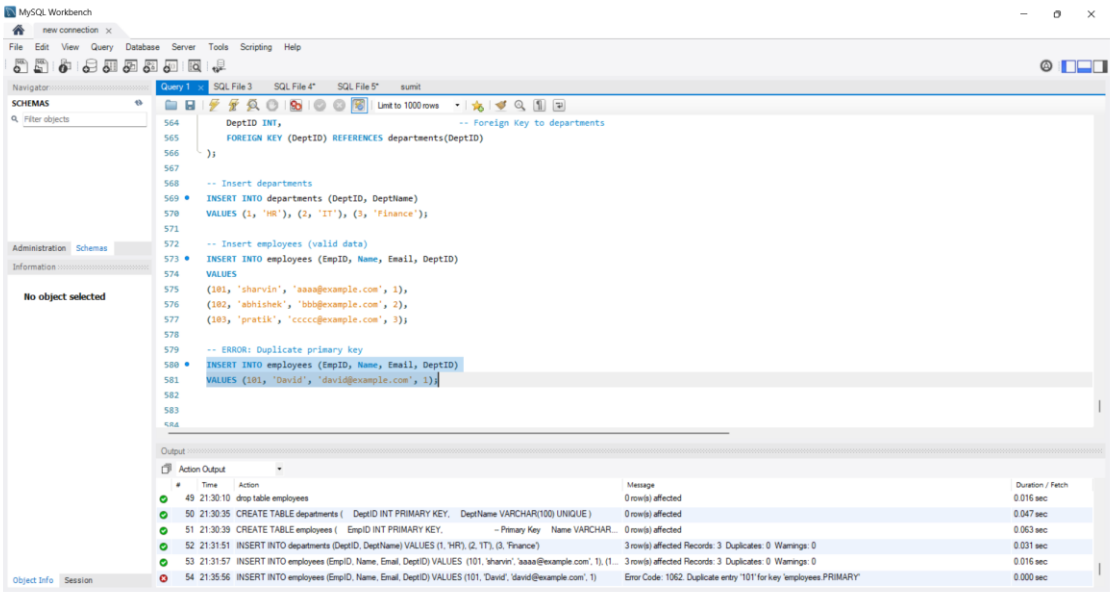
4. Create a table to store employee information with constraints like Primary Key, Foreign Key, and Unique. Insert valid and invalid data to test the constraints.

```
CREATE TABLE departments (
    DeptID INT PRIMARY KEY,
    DeptName VARCHAR(100) UNIQUE
);
CREATE TABLE employees (
    EmpID INT PRIMARY KEY,                    -- Primary Key
    Name VARCHAR(100) NOT NULL,
    Email VARCHAR(100) UNIQUE,                -- Unique Email
    DeptID INT,                        -- Foreign Key to departments
    FOREIGN KEY (DeptID) REFERENCES departments(DeptID)
);

-- Insert departments
INSERT INTO departments (DeptID, DeptName)
VALUES (1, 'HR'), (2, 'IT'), (3, 'Finance');

-- Insert employees (valid data)
INSERT INTO employees (EmpID, Name, Email, DeptID)
VALUES
(101, 'sharvin', 'aaaa@example.com', 1),
(102, 'abhishek', 'bbb@example.com', 2),
(103, 'pratik', 'ccccc@example.com', 3);
```

Insert Invalid Data to Test Constraints

◈ Duplicate empID (Primary Key Violation)

keyINSERT INTO employees (EmpID, Name, Email, DeptID)VALUES (101, 'David', 'david@example.com', 1);



```
    DeptID INT,                              -- Foreign Key to departments
    FOREIGN KEY (DeptID) REFERENCES departments(DeptID)
);

-- Insert departments
INSERT INTO departments (DeptID, DeptName)
VALUES (1, 'HR'), (2, 'IT'), (3, 'Finance');

-- Insert employees (valid data)
INSERT INTO employees (EmpID, Name, Email, DeptID)
VALUES
(101, 'sharvin', 'aaaa@example.com', 1),
(102, 'abhishek', 'bbb@example.com', 2),
(103, 'pratik', 'ccccc@example.com', 3);

-- ERROR: Duplicate primary key
INSERT INTO employees (EmpID, Name, Email, DeptID)
VALUES (101, 'David', 'david@example.com', 1);
```

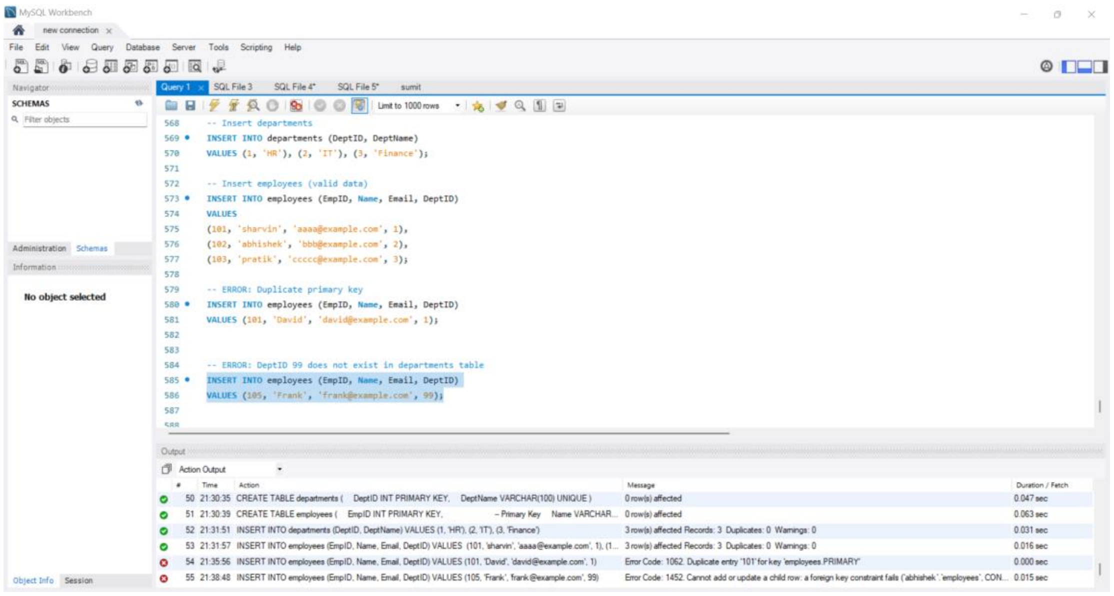
Output

Action Output

	#	Time	Action	Message	Duration / Fetch
✓	49	21:30:10	drop table employees	0 row(s) affected	0.016 sec
✓	50	21:30:35	CREATE TABLE departments (DeptID INT PRIMARY KEY, DeptName VARCHAR(100) UNIQUE)	0 row(s) affected	0.047 sec
✓	51	21:30:39	CREATE TABLE employees (EmpID INT PRIMARY KEY, -- Primary Key Name VARCHAR...	0 row(s) affected	0.063 sec
✓	52	21:31:51	INSERT INTO departments (DeptID, DeptName) VALUES (1, 'HR'), (2, 'IT'), (3, 'Finance')	3 row(s) affected Records: 3 Duplicates: 0 Warnings: 0	0.031 sec
✓	53	21:31:57	INSERT INTO employees (EmpID, Name, Email, DeptID) VALUES (101, 'sharvin', 'aaaa@example.com', 1), (1...	3 row(s) affected Records: 3 Duplicates: 0 Warnings: 0	0.016 sec
✗	54	21:35:56	INSERT INTO employees (EmpID, Name, Email, DeptID) VALUES (101, 'David', 'david@example.com', 1)	Error Code: 1062. Duplicate entry '101' for key 'employees.PRIMARY'	0.000 sec

Invalid DeptID (Foreign Key Constraint Violation)

INSERT INTO employees (EmpID, Name, Email, DeptID)VALUES (105, 'Frank', 'frank@example.com', 99);



```
-- Insert departments
INSERT INTO departments (DeptID, DeptName)
VALUES (1, 'HR'), (2, 'IT'), (3, 'Finance');

-- Insert employees (valid data)
INSERT INTO employees (EmpID, Name, Email, DeptID)
VALUES
(101, 'sharvin', 'aaaa@example.com', 1),
(102, 'abhishek', 'bbb@example.com', 2),
(103, 'pratik', 'ccccc@example.com', 3);

-- ERROR: Duplicate primary key
INSERT INTO employees (EmpID, Name, Email, DeptID)
VALUES (101, 'David', 'david@example.com', 1);


-- ERROR: DeptID 99 does not exist in departments table
INSERT INTO employees (EmpID, Name, Email, DeptID)
VALUES (105, 'Frank', 'frank@example.com', 99);
```

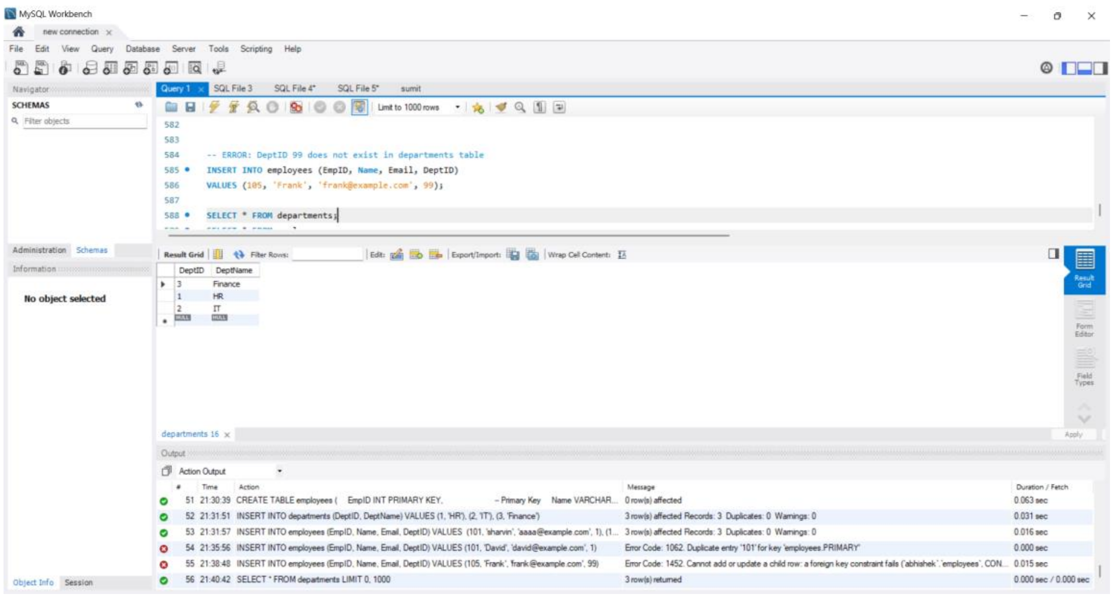
Output

Action Output

	#	Time	Action	Message	Duration / Fetch
✓	50	21:30:35	CREATE TABLE departments (DeptID INT PRIMARY KEY, DeptName VARCHAR(100) UNIQUE)	0 row(s) affected	0.047 sec
✓	51	21:30:39	CREATE TABLE employees (EmpID INT PRIMARY KEY, -- Primary Key Name VARCHAR...	0 row(s) affected	0.063 sec
✓	52	21:31:51	INSERT INTO departments (DeptID, DeptName) VALUES (1, 'HR'), (2, 'IT'), (3, 'Finance')	3 row(s) affected Records: 3 Duplicates: 0 Warnings: 0	0.031 sec
✓	53	21:31:57	INSERT INTO employees (EmpID, Name, Email, DeptID) VALUES (101, 'sharvin', 'aaaa@example.com', 1), (1...	3 row(s) affected Records: 3 Duplicates: 0 Warnings: 0	0.016 sec
✗	54	21:35:56	INSERT INTO employees (EmpID, Name, Email, DeptID) VALUES (101, 'David', 'david@example.com', 1)	Error Code: 1062. Duplicate entry '101' for key 'employees.PRIMARY'	0.000 sec
✗	55	21:38:48	INSERT INTO employees (EmpID, Name, Email, DeptID) VALUES (105, 'Frank', 'frank@example.com', 99)	Error Code: 1452. Cannot add or update a child row: a foreign key constraint fails ('abhishek'.'employees', CON...	0.015 sec

View Data

```
SELECT * FROM departments;
SELECT * FROM employees;
```



```
-- ERROR: DeptID 99 does not exist in departments table
INSERT INTO employees (EmpID, Name, Email, DeptID)
VALUES (105, 'Frank', 'frank@example.com', 99);

SELECT * FROM departments;
```

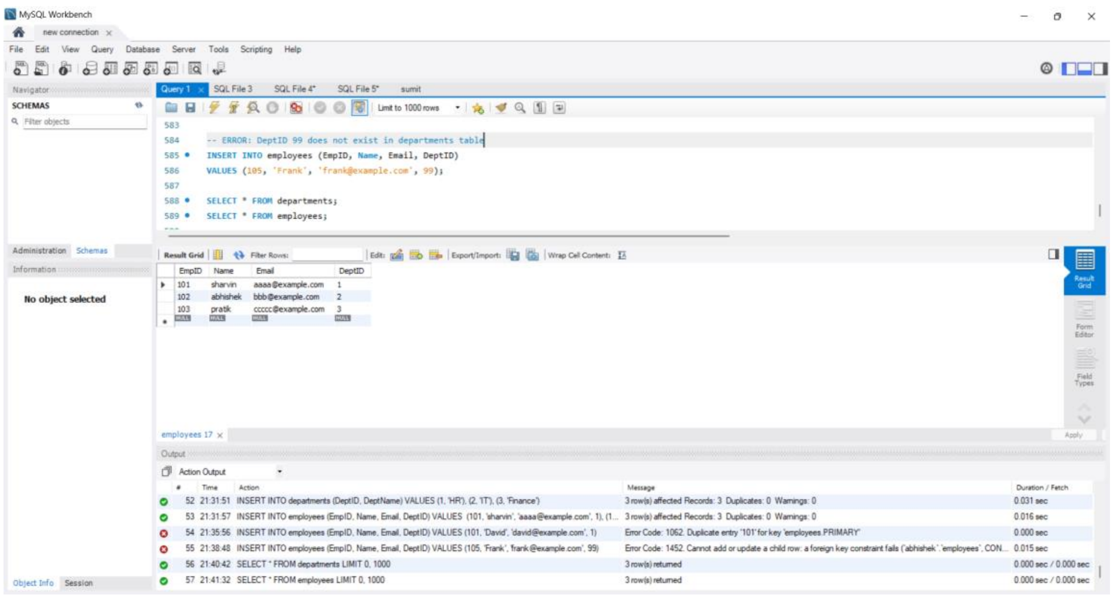
DeptID	DeptName
3	Finance
1	HR
2	IT
NULL	NULL

departments 16

Output

Action Output

```
#   Time      Action                                                                             Message                                                                                      Duration / Fetch
51  21:30:39  CREATE TABLE employees (   EmpID INT PRIMARY KEY,        -- Primary Key   Name VARCHAR...  0 row(s) affected                                                                          0.063 sec
52  21:31:51  INSERT INTO departments (DeptID, DeptName) VALUES (1, 'HR'), (2, 'IT'), (3, 'Finance')   3 row(s) affected Records: 3  Duplicates: 0  Warnings: 0                                     0.031 sec
53  21:31:57  INSERT INTO employees (EmpID, Name, Email, DeptID) VALUES  (101, 'sharvin', 'aaaa@example.com', 1), (1...  3 row(s) affected Records: 3  Duplicates: 0  Warnings: 0                 0.016 sec
54  21:35:56  INSERT INTO employees (EmpID, Name, Email, DeptID) VALUES (101, 'David', 'david@example.com', 1)  Error Code: 1062. Duplicate entry '101' for key 'employees.PRIMARY'                   0.000 sec
55  21:38:48  INSERT INTO employees (EmpID, Name, Email, DeptID) VALUES (105, 'Frank', 'frank@example.com', 99)  Error Code: 1452. Cannot add or update a child row: a foreign key constraint fails ('abhishek'.'employees', CON...  0.015 sec
56  21:40:42  SELECT * FROM departments LIMIT 0, 1000                                                   3 row(s) returned                                                                          0.000 sec / 0.000 sec
```



```
-- ERROR: DeptID 99 does not exist in departments table
INSERT INTO employees (EmpID, Name, Email, DeptID)
VALUES (105, 'Frank', 'frank@example.com', 99);

SELECT * FROM departments;
SELECT * FROM employees;
```

EmpID	Name	Email	DeptID
101	sharvin	aaaa@example.com	1
102	abhishek	bbb@example.com	2
103	pratik	ccccc@example.com	3
NULL	NULL	NULL	NULL

employees 17

Output

Action Output

```
#   Time      Action                                                                             Message                                                                                      Duration / Fetch
52  21:31:51  INSERT INTO departments (DeptID, DeptName) VALUES (1, 'HR'), (2, 'IT'), (3, 'Finance')   3 row(s) affected Records: 3  Duplicates: 0  Warnings: 0                                     0.031 sec
53  21:31:57  INSERT INTO employees (EmpID, Name, Email, DeptID) VALUES  (101, 'sharvin', 'aaaa@example.com', 1), (1...  3 row(s) affected Records: 3  Duplicates: 0  Warnings: 0                 0.016 sec
54  21:35:56  INSERT INTO employees (EmpID, Name, Email, DeptID) VALUES (101, 'David', 'david@example.com', 1)  Error Code: 1062. Duplicate entry '101' for key 'employees.PRIMARY'                   0.000 sec
55  21:38:48  INSERT INTO employees (EmpID, Name, Email, DeptID) VALUES (105, 'Frank', 'frank@example.com', 99)  Error Code: 1452. Cannot add or update a child row: a foreign key constraint fails ('abhishek'.'employees', CON...  0.015 sec
56  21:40:42  SELECT * FROM departments LIMIT 0, 1000                                                   3 row(s) returned                                                                          0.000 sec / 0.000 sec
57  21:41:32  SELECT * FROM employees LIMIT 0, 1000                                                     3 row(s) returned                                                                          0.000 sec / 0.000 sec
```

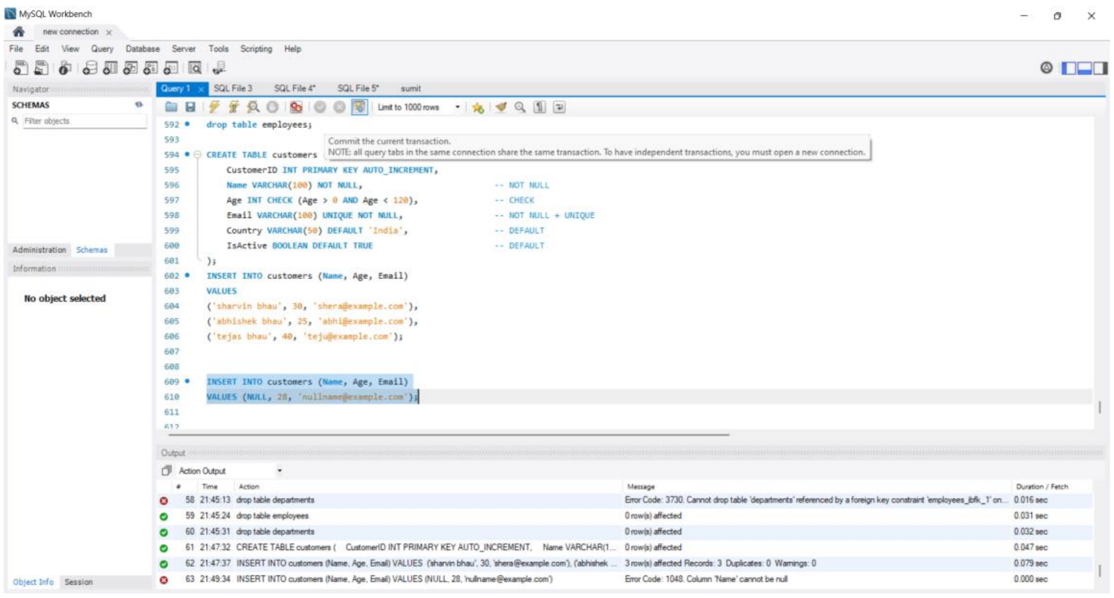
5. Create a table for Customer details with various integrity constraints like NOT NULL, CHECK, and DEFAULT. Insert valid and invalid data to test these constraints and ensure data integrity.

Ans CREATE TABLE customers (

```
    CustomerID INT PRIMARY KEY AUTO_INCREMENT,
    Name VARCHAR(100) NOT NULL,                    -- NOT NULL
    Age INT CHECK (Age > 0 AND Age < 120),          -- CHECK
    Email VARCHAR(100) UNIQUE NOT NULL,                -- NOT NULL +
UNIQUE
    Country VARCHAR(50) DEFAULT 'India',            -- DEFAULT
    IsActive BOOLEAN DEFAULT TRUE                   -- DEFAULT
);
INSERT INTO customers (Name, Age, Email)
VALUES
('sharvin bhau', 30, 'shera@example.com'),
('abhishek bhau', 25, 'abhi@example.com'),
('tejas bhau', 40, 'teju@example.com');
```

Insert Invalid Data to Test Constraints

```
INSERT INTO customers (Name, Age, Email)VALUES (NULL, 28,
'nullname@example.com');
```



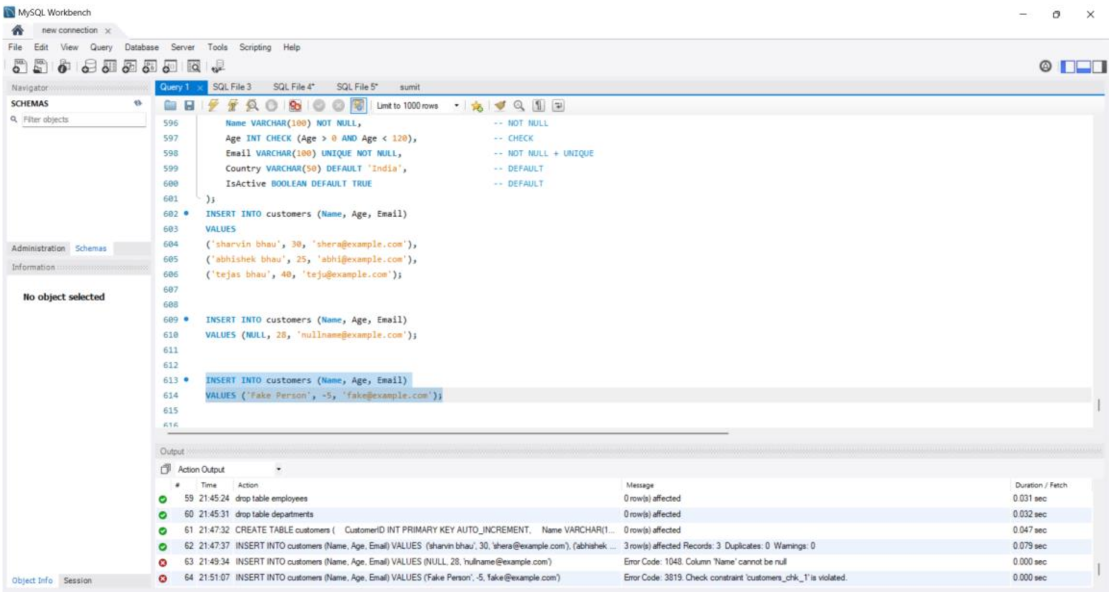
```
drop table employees;

CREATE TABLE customers (
    CustomerID INT PRIMARY KEY AUTO_INCREMENT,
    Name VARCHAR(100) NOT NULL,                    -- NOT NULL
    Age INT CHECK (Age > 0 AND Age < 120),         -- CHECK
    Email VARCHAR(100) UNIQUE NOT NULL,            -- NOT NULL + UNIQUE
    Country VARCHAR(50) DEFAULT 'India',           -- DEFAULT
    IsActive BOOLEAN DEFAULT TRUE                  -- DEFAULT
);
INSERT INTO customers (Name, Age, Email)
VALUES
('sharvin bhau', 30, 'shera@example.com'),
('abhishek bhau', 25, 'abhi@example.com'),
('tejas bhau', 40, 'teju@example.com');


INSERT INTO customers (Name, Age, Email)
VALUES (NULL, 28, 'nullname@example.com');
```

Commit the current transaction.
NOTE: all query tabs in the same connection share the same transaction. To have independent transactions, you must open a new connection.

```
#   Time      Action                                                                        Message                                                                                    Duration / Fetch
58  21:45:13  drop table departments                                                        Error Code: 3730. Cannot drop table 'departments' referenced by a foreign key constraint 'employees_ibfk_1' on...  0.016 sec
59  21:45:24  drop table employees                                                          0 row(s) affected                                                                          0.031 sec
60  21:45:31  drop table departments                                                        0 row(s) affected                                                                          0.032 sec
61  21:47:32  CREATE TABLE customers (    CustomerID INT PRIMARY KEY AUTO_INCREMENT,    Name VARCHAR(1...  0 row(s) affected                                                   0.047 sec
62  21:47:37  INSERT INTO customers (Name, Age, Email) VALUES ('sharvin bhau', 30, 'shera@example.com'), ('abhishek ...  3 row(s) affected Records: 3  Duplicates: 0  Warnings: 0     0.079 sec
63  21:49:34  INSERT INTO customers (Name, Age, Email) VALUES (NULL, 28, 'nullname@example.com')  Error Code: 1048. Column 'Name' cannot be null                                            0.000 sec
```

Negative Age (CHECK constraint violation)

```
INSERT INTO customers (Name, Age, Email)VALUES ('Fake Person', -5,
```

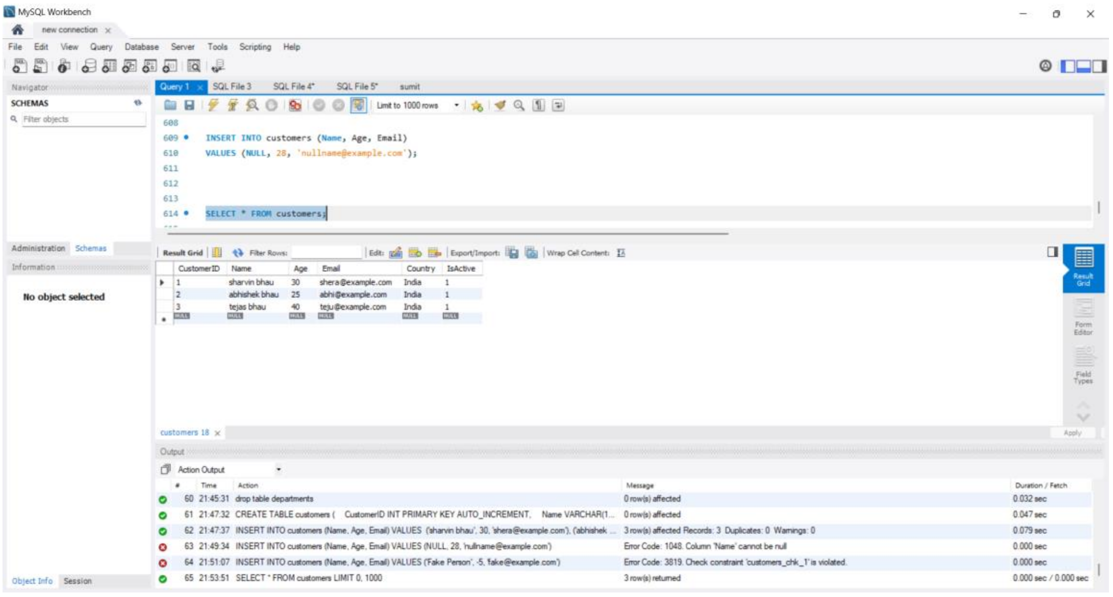


```
    Name VARCHAR(100) NOT NULL,                    -- NOT NULL
    Age INT CHECK (Age > 0 AND Age < 120),         -- CHECK
    Email VARCHAR(100) UNIQUE NOT NULL,            -- NOT NULL + UNIQUE
    Country VARCHAR(50) DEFAULT 'India',           -- DEFAULT
    IsActive BOOLEAN DEFAULT TRUE                  -- DEFAULT
);
INSERT INTO customers (Name, Age, Email)
VALUES
('sharvin bhau', 30, 'shera@example.com'),
('abhishek bhau', 25, 'abhi@example.com'),
('tejas bhau', 40, 'teju@example.com');


INSERT INTO customers (Name, Age, Email)
VALUES (NULL, 28, 'nullname@example.com');


INSERT INTO customers (Name, Age, Email)
VALUES ('Fake Person', -5, 'fake@example.com');
```

```
#   Time      Action                                                                                      Message                                                          Duration / Fetch
59  21:45:24  drop table employees                                                                        0 row(s) affected                                                0.031 sec
60  21:45:31  drop table departments                                                                      0 row(s) affected                                                0.032 sec
61  21:47:32  CREATE TABLE customers (    CustomerID INT PRIMARY KEY AUTO_INCREMENT,    Name VARCHAR(1...  0 row(s) affected                                                0.047 sec
62  21:47:37  INSERT INTO customers (Name, Age, Email) VALUES  ('sharvin bhau', 30, 'shera@example.com'), ('abhishek ...  3 row(s) affected Records: 3  Duplicates: 0  Warnings: 0  0.079 sec
63  21:49:34  INSERT INTO customers (Name, Age, Email) VALUES (NULL, 28, 'nullname@example.com')         Error Code: 1048. Column 'Name' cannot be null                   0.000 sec
64  21:51:07  INSERT INTO customers (Name, Age, Email) VALUES ('Fake Person', -5, 'fake@example.com')      Error Code: 3819. Check constraint 'customers_chk_1' is violated.  0.000 sec
```

View the Valid Data

SELECT * FROM customers;



```
INSERT INTO customers (Name, Age, Email)
VALUES (NULL, 28, 'nullname@example.com');



SELECT * FROM customers;
```

	CustomerID	Name	Age	Email	Country	IsActive
▶	1	sharvin bhau	30	shera@example.com	India	1
	2	abhishek bhau	25	abhi@example.com	India	1
	3	tejas bhau	40	teju@example.com	India	1
*	NULL	NULL	NULL	NULL	NULL	NULL

```
#   Time      Action                                                                                      Message                                                          Duration / Fetch
60  21:45:31  drop table departments                                                                      0 row(s) affected                                                0.032 sec
61  21:47:32  CREATE TABLE customers (    CustomerID INT PRIMARY KEY AUTO_INCREMENT,    Name VARCHAR(1...  0 row(s) affected                                                0.047 sec
62  21:47:37  INSERT INTO customers (Name, Age, Email) VALUES  ('sharvin bhau', 30, 'shera@example.com'), ('abhishek ...  3 row(s) affected Records: 3  Duplicates: 0  Warnings: 0  0.079 sec
63  21:49:34  INSERT INTO customers (Name, Age, Email) VALUES (NULL, 28, 'nullname@example.com')         Error Code: 1048. Column 'Name' cannot be null                   0.000 sec
64  21:51:07  INSERT INTO customers (Name, Age, Email) VALUES ('Fake Person', -5, 'fake@example.com')      Error Code: 3819. Check constraint 'customers_chk_1' is violated.  0.000 sec
65  21:53:51  SELECT * FROM customers LIMIT 0, 1000                                                       3 row(s) returned                                                0.000 sec / 0.000 sec
```

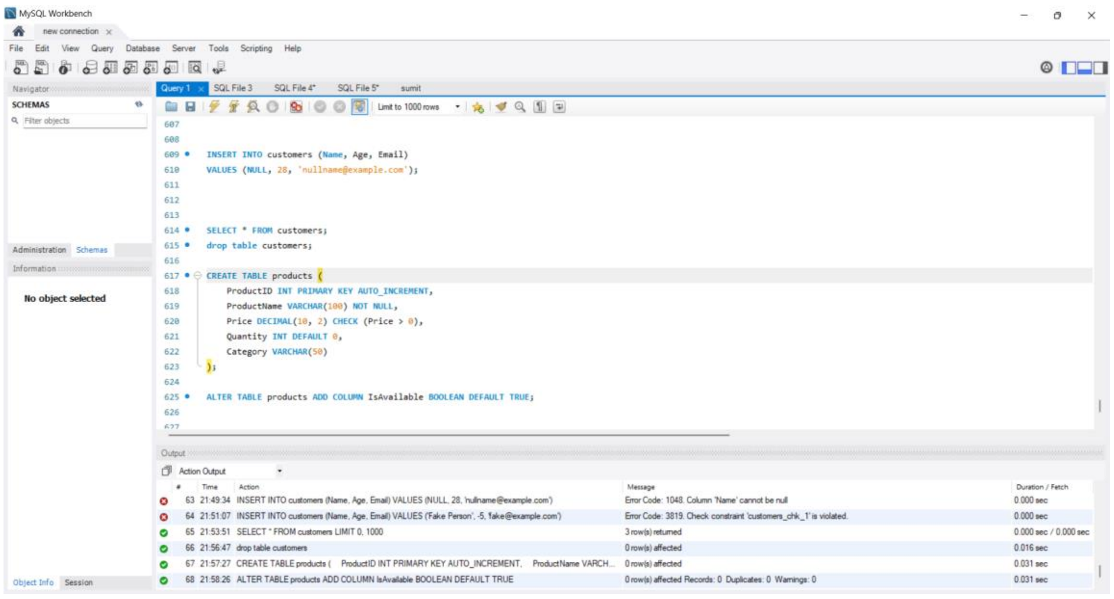
6. Use DDL commands to create tables and DML commands to insert, update, and delete data. Write SELECT queries to retrieve and verify data changes.

Ans CREATE TABLE products (

```
    ProductID INT PRIMARY KEY AUTO_INCREMENT,
    ProductName VARCHAR(100) NOT NULL,
    Price DECIMAL(10, 2) CHECK (Price > 0),
    Quantity INT DEFAULT 0,
    Category VARCHAR(50)
);
```

Alter Table – Add a new column

```
ALTER TABLE products ADD COLUMN IsAvailable BOOLEAN DEFAULT TRUE;
```



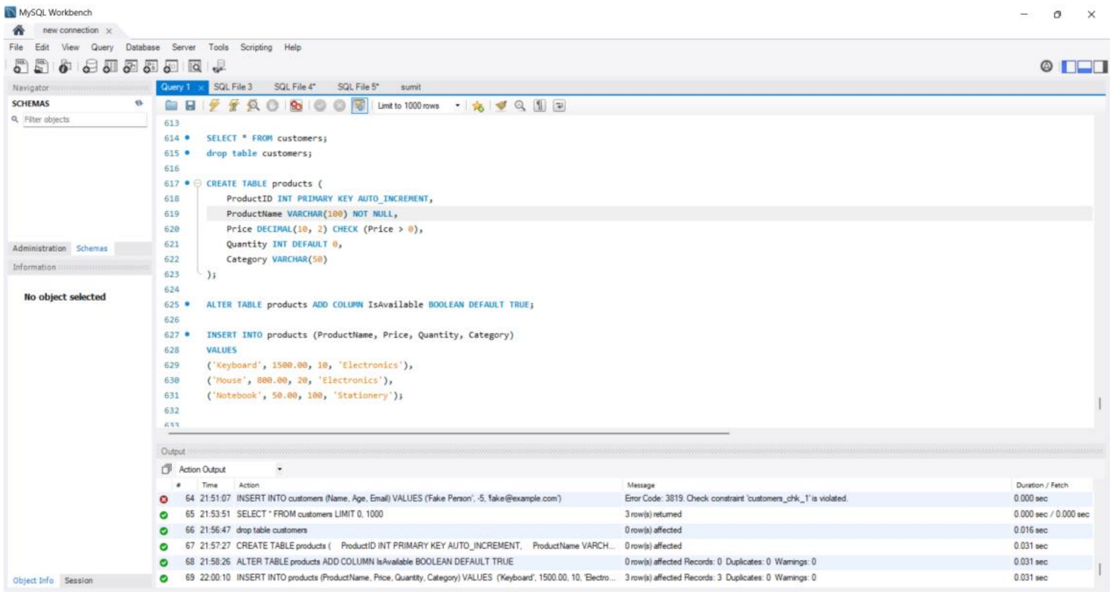
```
INSERT INTO customers (Name, Age, Email)
VALUES (NULL, 28, 'nullname@example.com');



SELECT * FROM customers;
drop table customers;

CREATE TABLE products (
    ProductID INT PRIMARY KEY AUTO_INCREMENT,
    ProductName VARCHAR(100) NOT NULL,
    Price DECIMAL(10, 2) CHECK (Price > 0),
    Quantity INT DEFAULT 0,
    Category VARCHAR(50)
);

ALTER TABLE products ADD COLUMN IsAvailable BOOLEAN DEFAULT TRUE;
```

```
#   Time      Action                                                                          Message                                                      Duration / Fetch
63  21:49:34  INSERT INTO customers (Name, Age, Email) VALUES (NULL, 28, 'nullname@example.com')  Error Code: 1048. Column 'Name' cannot be null               0.000 sec
64  21:51:07  INSERT INTO customers (Name, Age, Email) VALUES ('Fake Person', -5, 'fake@example.com') Error Code: 3819. Check constraint 'customers_chk_1' is violated. 0.000 sec
65  21:53:51  SELECT * FROM customers LIMIT 0, 1000                                            3 row(s) returned                                            0.000 sec / 0.000 sec
66  21:56:47  drop table customers                                                             0 row(s) affected                                            0.016 sec
67  21:57:27  CREATE TABLE products (    ProductID INT PRIMARY KEY AUTO_INCREMENT,    ProductName VARCH...  0 row(s) affected                           0.031 sec
68  21:58:26  ALTER TABLE products ADD COLUMN IsAvailable BOOLEAN DEFAULT TRUE                  0 row(s) affected Records: 0  Duplicates: 0  Warnings: 0     0.031 sec
```

Use DML Commands

◈ INSERT Data

```
INSERT INTO products (ProductName, Price, Quantity, Category)VALUES
('Keyboard', 1500.00, 10, 'Electronics'),
('Mouse', 800.00, 20, 'Electronics'),
('Notebook', 50.00, 100, 'Stationery');
```

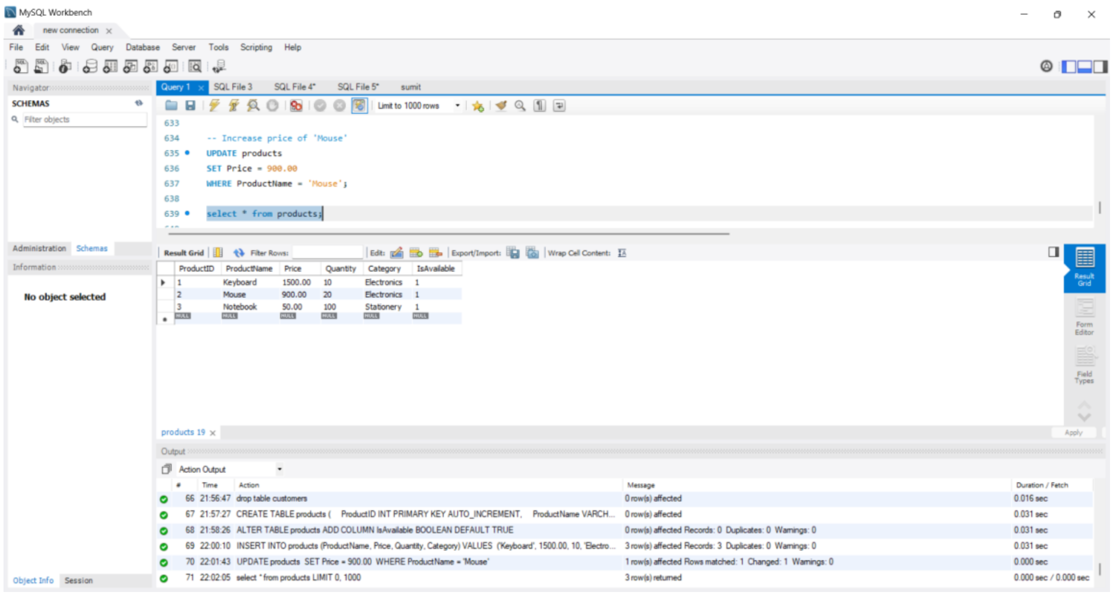


```sql
SELECT * FROM customers;
drop table customers;

CREATE TABLE products (
    ProductID INT PRIMARY KEY AUTO_INCREMENT,
    ProductName VARCHAR(100) NOT NULL,
    Price DECIMAL(10, 2) CHECK (Price > 0),
    Quantity INT DEFAULT 0,
    Category VARCHAR(50)
);

ALTER TABLE products ADD COLUMN IsAvailable BOOLEAN DEFAULT TRUE;

INSERT INTO products (ProductName, Price, Quantity, Category)
VALUES
('Keyboard', 1500.00, 10, 'Electronics'),
('Mouse', 800.00, 20, 'Electronics'),
('Notebook', 50.00, 100, 'Stationery');
```

```
#   Time      Action                                                                                   Message                                                          Duration / Fetch
64  21:51:07  INSERT INTO customers (Name, Age, Email) VALUES ('Fake Person', -5, 'fake@example.com')   Error Code: 3819. Check constraint 'customers_chk_1' is violated.  0.000 sec
65  21:53:51  SELECT * FROM customers LIMIT 0, 1000                                                     3 row(s) returned                                                0.000 sec / 0.000 sec
66  21:56:47  drop table customers                                                                      0 row(s) affected                                                0.016 sec
67  21:57:27  CREATE TABLE products (    ProductID INT PRIMARY KEY AUTO_INCREMENT,    ProductName VARCH...   0 row(s) affected                                          0.031 sec
68  21:58:26  ALTER TABLE products ADD COLUMN IsAvailable BOOLEAN DEFAULT TRUE                           0 row(s) affected Records: 0  Duplicates: 0  Warnings: 0         0.031 sec
69  22:00:10  INSERT INTO products (ProductName, Price, Quantity, Category) VALUES  ('Keyboard', 1500.00, 10, 'Electro...   3 row(s) affected Records: 3  Duplicates: 0  Warnings: 0   0.031 sec
```

UPDATE Data

UPDATE products SET Price = 900.00 WHERE ProductName = ’Mouse’;



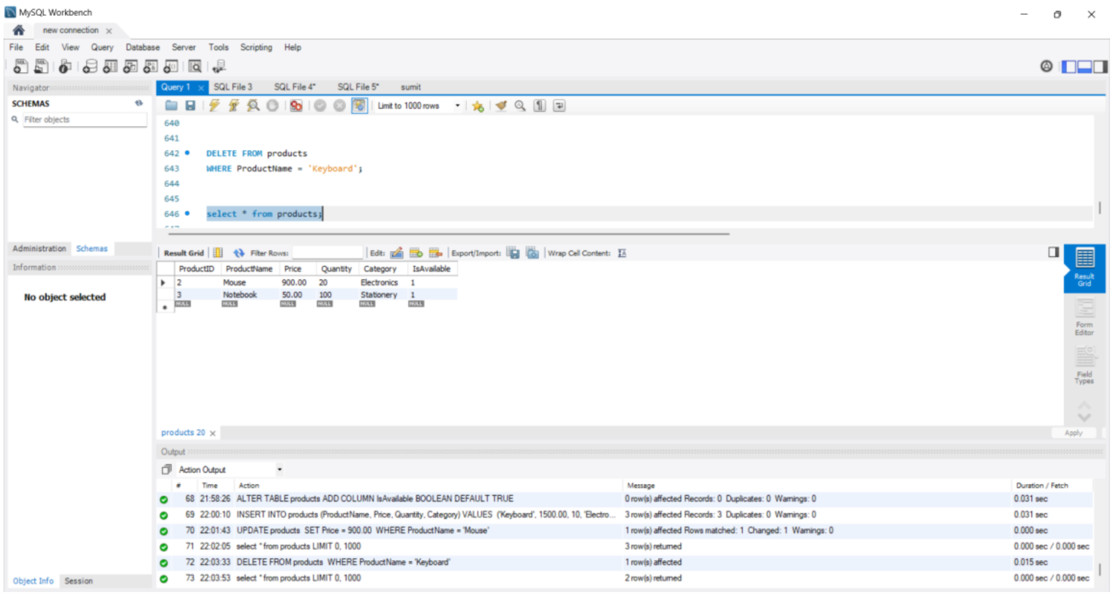
```sql
-- Increase price of 'Mouse'
UPDATE products
SET Price = 900.00
WHERE ProductName = 'Mouse';

select * from products;
```

ProductID	ProductName	Price	Quantity	Category	IsAvailable
1	Keyboard	1500.00	10	Electronics	1
2	Mouse	900.00	20	Electronics	1
3	Notebook	50.00	100	Stationery	1
NULL	NULL	NULL	NULL	NULL	NULL

```
#   Time      Action                                                                                   Message                                                          Duration / Fetch
66  21:56:47  drop table customers                                                                      0 row(s) affected                                                0.016 sec
67  21:57:27  CREATE TABLE products (    ProductID INT PRIMARY KEY AUTO_INCREMENT,    ProductName VARCH...   0 row(s) affected                                          0.031 sec
68  21:58:26  ALTER TABLE products ADD COLUMN IsAvailable BOOLEAN DEFAULT TRUE                           0 row(s) affected Records: 0  Duplicates: 0  Warnings: 0         0.031 sec
69  22:00:10  INSERT INTO products (ProductName, Price, Quantity, Category) VALUES  ('Keyboard', 1500.00, 10, 'Electro...   3 row(s) affected Records: 3  Duplicates: 0  Warnings: 0   0.031 sec
70  22:01:43  UPDATE products  SET Price = 900.00  WHERE ProductName = 'Mouse'                           1 row(s) affected Rows matched: 1  Changed: 1  Warnings: 0      0.000 sec
71  22:02:05  select * from products LIMIT 0, 1000                                                      3 row(s) returned                                                0.000 sec / 0.000 sec
```

DELETE Data

DELETE FROM products WHERE ProductName = ’Keyboard’;



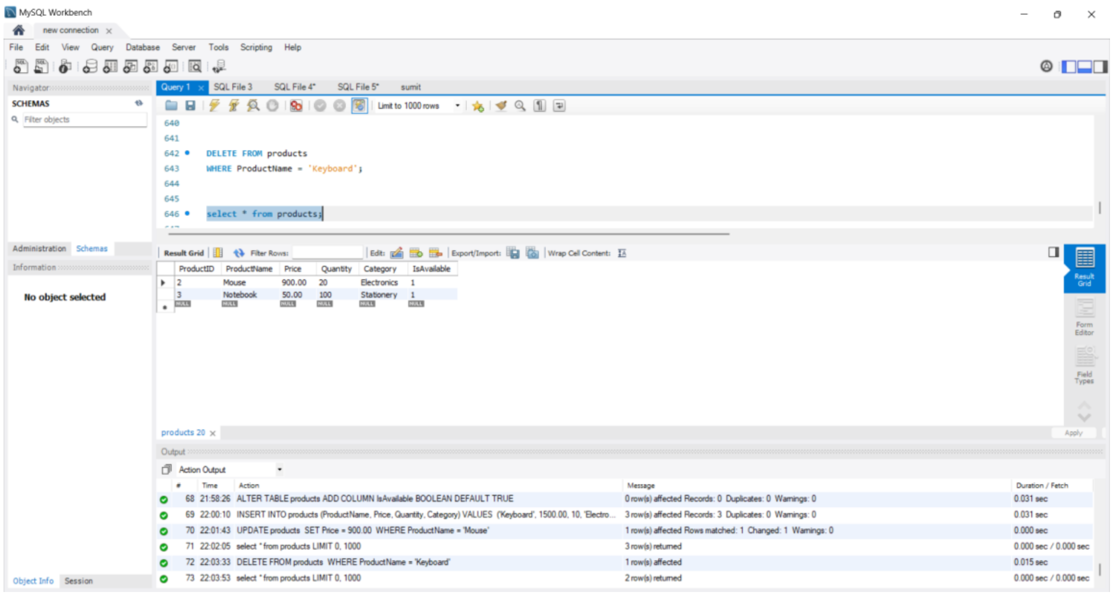
```
DELETE FROM products
WHERE ProductName = 'Keyboard';


select * from products;
```

ProductID	ProductName	Price	Quantity	Category	IsAvailable
2	Mouse	900.00	20	Electronics	1
3	Notebook	50.00	100	Stationery	1
NULL	NULL	NULL	NULL	NULL	NULL

```
#   Time      Action                                                                                   Message                                                          Duration / Fetch
68  21:58:26  ALTER TABLE products ADD COLUMN IsAvailable BOOLEAN DEFAULT TRUE                         0 row(s) affected Records: 0  Duplicates: 0  Warnings: 0         0.031 sec
69  22:00:10  INSERT INTO products (ProductName, Price, Quantity, Category) VALUES ('Keyboard', 1500.00, 10, 'Electro...   3 row(s) affected Records: 3  Duplicates: 0  Warnings: 0   0.031 sec
70  22:01:43  UPDATE products  SET Price = 900.00  WHERE ProductName = 'Mouse'                         1 row(s) affected Rows matched: 1  Changed: 1  Warnings: 0      0.000 sec
71  22:02:05  select * from products LIMIT 0, 1000                                                     3 row(s) returned                                                0.000 sec / 0.000 sec
72  22:03:33  DELETE FROM products  WHERE ProductName = 'Keyboard'                                     1 row(s) affected                                                0.015 sec
73  22:03:53  select * from products LIMIT 0, 1000                                                     2 row(s) returned                                                0.000 sec / 0.000 sec
```

View All Products

```
SELECT * FROM products;
```



```
DELETE FROM products
WHERE ProductName = 'Keyboard';


select * from products;
```

ProductID	ProductName	Price	Quantity	Category	IsAvailable
2	Mouse	900.00	20	Electronics	1
3	Notebook	50.00	100	Stationery	1
NULL	NULL	NULL	NULL	NULL	NULL

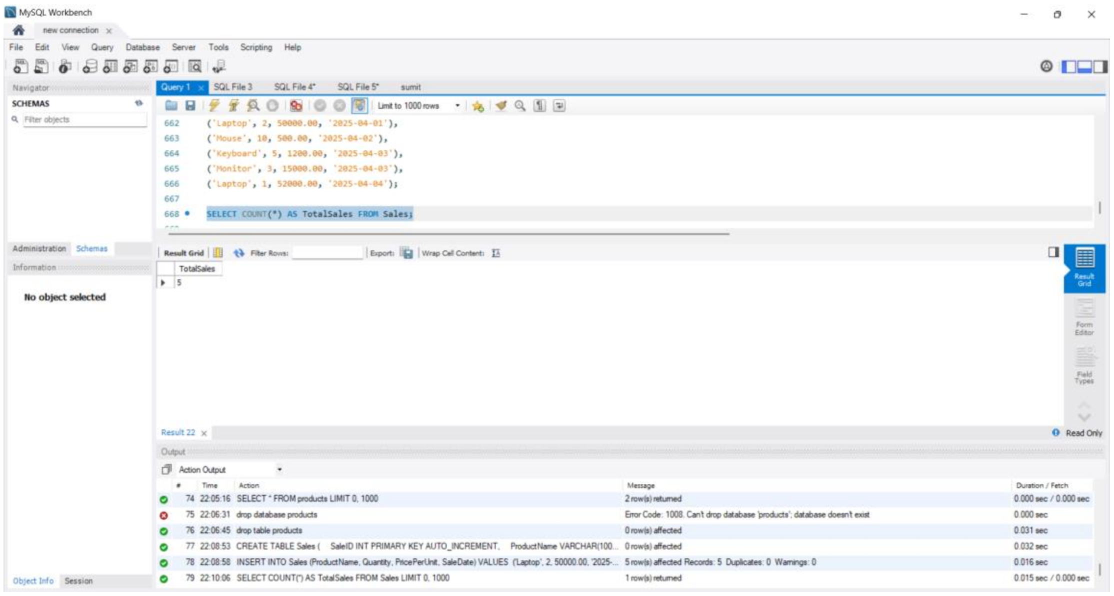
```
#   Time      Action                                                                                   Message                                                          Duration / Fetch
68  21:58:26  ALTER TABLE products ADD COLUMN IsAvailable BOOLEAN DEFAULT TRUE                         0 row(s) affected Records: 0  Duplicates: 0  Warnings: 0         0.031 sec
69  22:00:10  INSERT INTO products (ProductName, Price, Quantity, Category) VALUES ('Keyboard', 1500.00, 10, 'Electro...   3 row(s) affected Records: 3  Duplicates: 0  Warnings: 0   0.031 sec
70  22:01:43  UPDATE products  SET Price = 900.00  WHERE ProductName = 'Mouse'                         1 row(s) affected Rows matched: 1  Changed: 1  Warnings: 0      0.000 sec
71  22:02:05  select * from products LIMIT 0, 1000                                                     3 row(s) returned                                                0.000 sec / 0.000 sec
72  22:03:33  DELETE FROM products  WHERE ProductName = 'Keyboard'                                     1 row(s) affected                                                0.015 sec
73  22:03:53  select * from products LIMIT 0, 1000                                                     2 row(s) returned                                                0.000 sec / 0.000 sec
```

7. Create a Sales table and use aggregate functions like COUNT, SUM, AVG, MIN, and MAX to summarize sales data and calculate statistics.

```
CREATE TABLE Sales (
    SaleID INT PRIMARY KEY AUTO_INCREMENT,
    ProductName VARCHAR(100) NOT NULL,
    Quantity INT NOT NULL CHECK (Quantity > 0),
    PricePerUnit DECIMAL(10, 2) NOT NULL CHECK (PricePerUnit > 0),
    SaleDate DATE NOT NULL
);
INSERT INTO Sales (ProductName, Quantity, PricePerUnit, SaleDate)
VALUES
('Laptop', 2, 50000.00, '2025-04-01'),
('Mouse', 10, 500.00, '2025-04-02'),
('Keyboard', 5, 1200.00, '2025-04-03'),
('Monitor', 3, 15000.00, '2025-04-03'),
('Laptop', 1, 52000.00, '2025-04-04');
```

COUNT() - Total number of sales

```
SELECT COUNT(*) AS TotalSales FROM Sales;
```



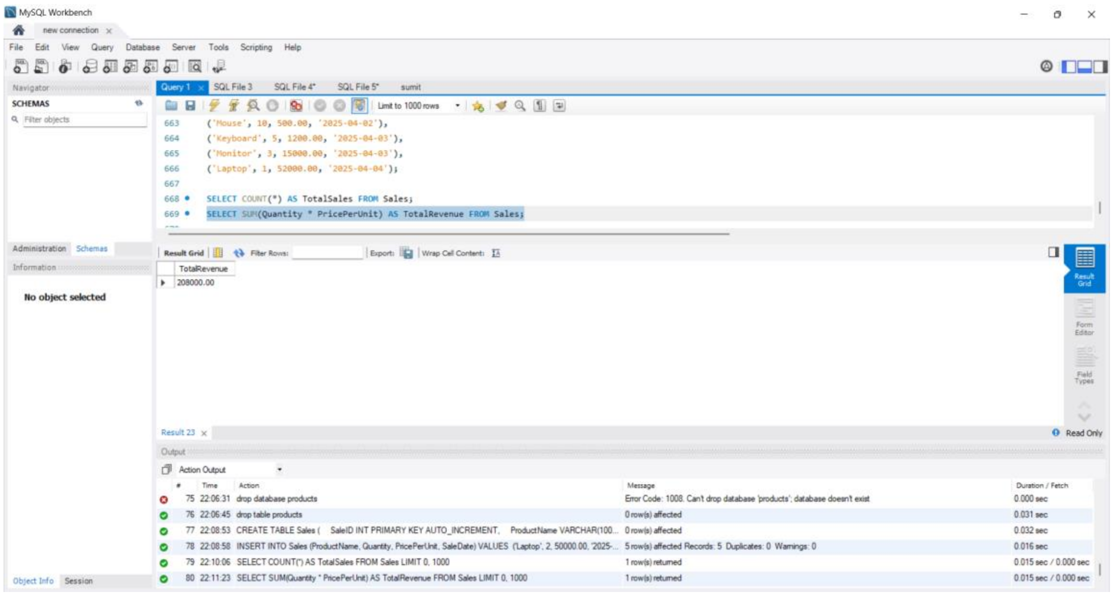
```
('Laptop', 2, 50000.00, '2025-04-01'),
('Mouse', 10, 500.00, '2025-04-02'),
('Keyboard', 5, 1200.00, '2025-04-03'),
('Monitor', 3, 15000.00, '2025-04-03'),
('Laptop', 1, 52000.00, '2025-04-04');

SELECT COUNT(*) AS TotalSales FROM Sales;
```

	TotalSales
▶	5

	#	Time	Action	Message	Duration / Fetch
✓	74	22:05:16	SELECT * FROM products LIMIT 0, 1000	2 row(s) returned	0.000 sec / 0.000 sec
✗	75	22:06:31	drop database products	Error Code: 1008. Can't drop database 'products'; database doesn't exist	0.000 sec
✓	76	22:06:45	drop table products	0 row(s) affected	0.031 sec
✓	77	22:08:53	CREATE TABLE Sales (SaleID INT PRIMARY KEY AUTO_INCREMENT, ProductName VARCHAR(100...	0 row(s) affected	0.032 sec
✓	78	22:08:58	INSERT INTO Sales (ProductName, Quantity, PricePerUnit, SaleDate) VALUES ('Laptop', 2, 50000.00, '2025-...	5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0	0.016 sec
✓	79	22:10:06	SELECT COUNT(*) AS TotalSales FROM Sales LIMIT 0, 1000	1 row(s) returned	0.015 sec / 0.000 sec

SUM() - Total revenue from all sales

```
SELECT SUM(Quantity * PricePerUnit) AS TotalRevenue FROM Sales;
```



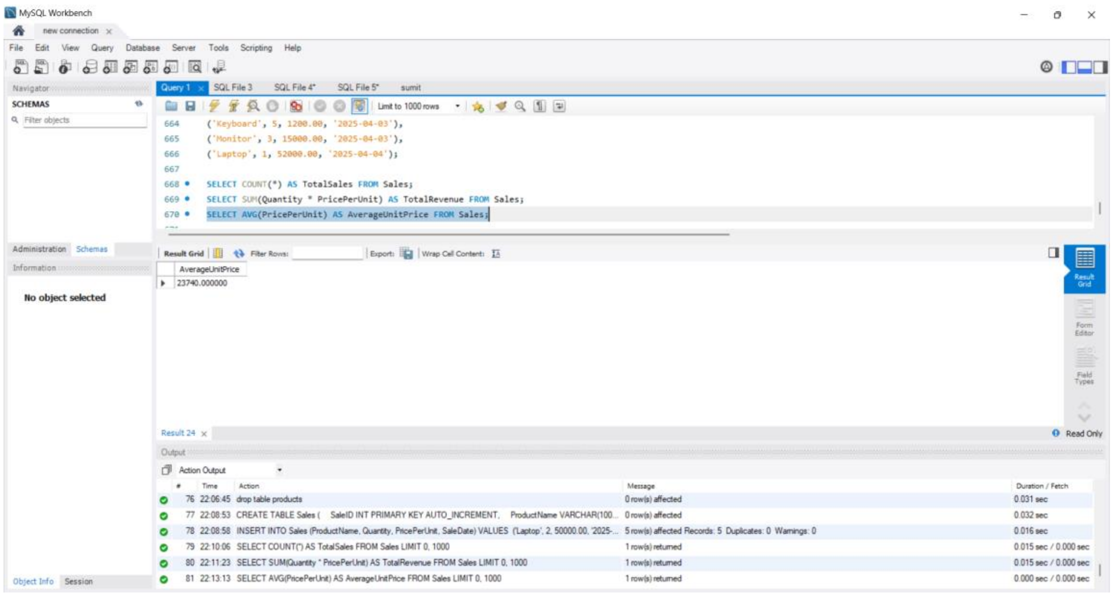
```
('Mouse', 10, 500.00, '2025-04-02'),
('Keyboard', 5, 1200.00, '2025-04-03'),
('Monitor', 3, 15000.00, '2025-04-03'),
('Laptop', 1, 52000.00, '2025-04-04');

SELECT COUNT(*) AS TotalSales FROM Sales;
SELECT SUM(Quantity * PricePerUnit) AS TotalRevenue FROM Sales;
```

	TotalRevenue
▶	208000.00

```
#   Time     Action                                                                                    Message                                                                      Duration / Fetch
75  22:06:31 drop database products                                                                    Error Code: 1008. Can't drop database 'products'; database doesn't exist    0.000 sec
76  22:06:45 drop table products                                                                       0 row(s) affected                                                            0.031 sec
77  22:08:53 CREATE TABLE Sales (    SaleID INT PRIMARY KEY AUTO_INCREMENT,    ProductName VARCHAR(100...  0 row(s) affected                                                            0.032 sec
78  22:08:58 INSERT INTO Sales (ProductName, Quantity, PricePerUnit, SaleDate) VALUES ('Laptop', 2, 50000.00, '2025-...  5 row(s) affected Records: 5  Duplicates: 0  Warnings: 0  0.016 sec
79  22:10:06 SELECT COUNT(*) AS TotalSales FROM Sales LIMIT 0, 1000                                    1 row(s) returned                                                            0.015 sec / 0.000 sec
80  22:11:23 SELECT SUM(Quantity * PricePerUnit) AS TotalRevenue FROM Sales LIMIT 0, 1000             1 row(s) returned                                                            0.015 sec / 0.000 sec
```

AVG() – Average price per unit across all sales

SELECT AVG(PricePerUnit) AS AverageUnitPrice FROM Sales;



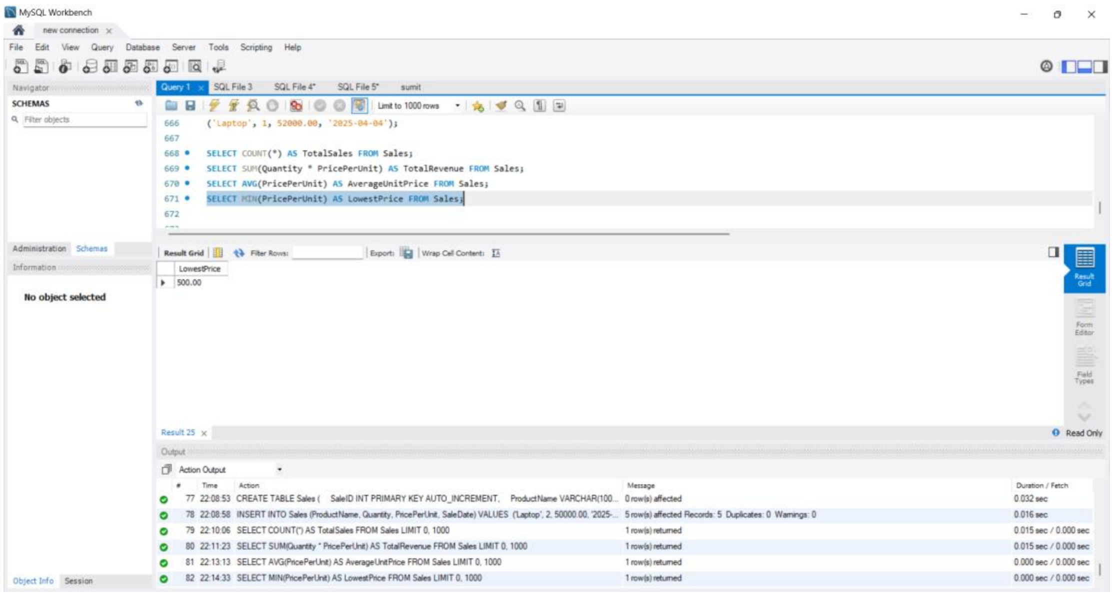
```
('Keyboard', 5, 1200.00, '2025-04-03'),
('Monitor', 3, 15000.00, '2025-04-03'),
('Laptop', 1, 52000.00, '2025-04-04');

SELECT COUNT(*) AS TotalSales FROM Sales;
SELECT SUM(Quantity * PricePerUnit) AS TotalRevenue FROM Sales;
SELECT AVG(PricePerUnit) AS AverageUnitPrice FROM Sales;
```

	AverageUnitPrice
▶	23740.000000

```
#   Time     Action                                                                                    Message                                                                      Duration / Fetch
76  22:06:45 drop table products                                                                       0 row(s) affected                                                            0.031 sec
77  22:08:53 CREATE TABLE Sales (    SaleID INT PRIMARY KEY AUTO_INCREMENT,    ProductName VARCHAR(100...  0 row(s) affected                                                            0.032 sec
78  22:08:58 INSERT INTO Sales (ProductName, Quantity, PricePerUnit, SaleDate) VALUES ('Laptop', 2, 50000.00, '2025-...  5 row(s) affected Records: 5  Duplicates: 0  Warnings: 0  0.016 sec
79  22:10:06 SELECT COUNT(*) AS TotalSales FROM Sales LIMIT 0, 1000                                    1 row(s) returned                                                            0.015 sec / 0.000 sec
80  22:11:23 SELECT SUM(Quantity * PricePerUnit) AS TotalRevenue FROM Sales LIMIT 0, 1000             1 row(s) returned                                                            0.015 sec / 0.000 sec
81  22:13:13 SELECT AVG(PricePerUnit) AS AverageUnitPrice FROM Sales LIMIT 0, 1000                    1 row(s) returned                                                            0.000 sec / 0.000 sec
```

MIN() – Lowest price per unit

SELECT MIN(PricePerUnit) AS LowestPrice FROM Sales;



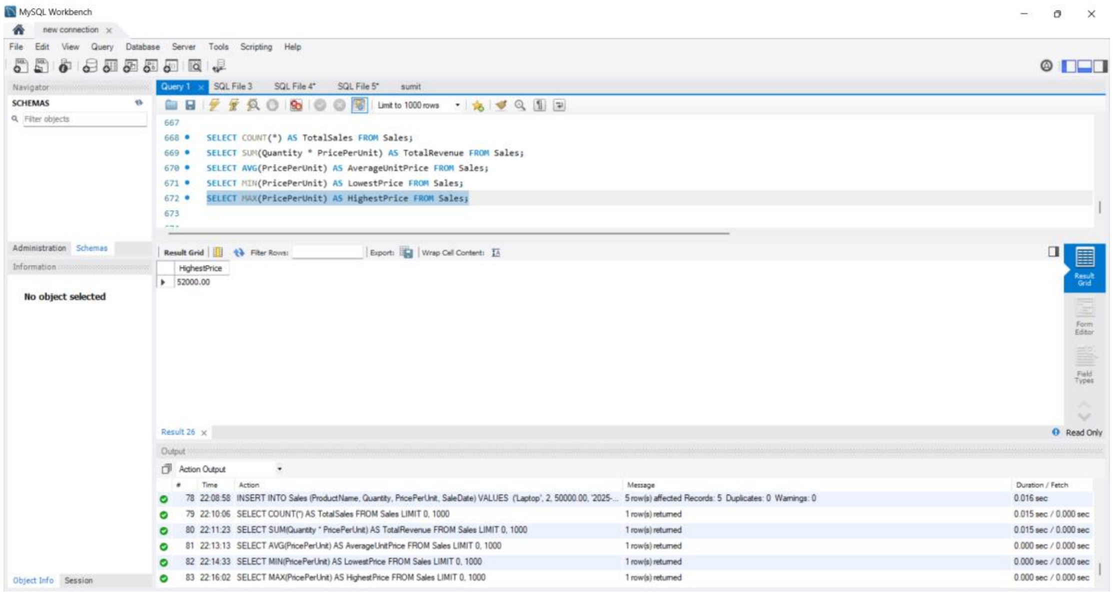
```
('Laptop', 1, 52000.00, '2025-04-04');

SELECT COUNT(*) AS TotalSales FROM Sales;
SELECT SUM(Quantity * PricePerUnit) AS TotalRevenue FROM Sales;
SELECT AVG(PricePerUnit) AS AverageUnitPrice FROM Sales;
SELECT MIN(PricePerUnit) AS LowestPrice FROM Sales;
```

```
LowestPrice
500.00
```

```
#   Time      Action                                                                                                   Message                                                   Duration / Fetch
77  22:08:53  CREATE TABLE Sales (   SaleID INT PRIMARY KEY AUTO_INCREMENT,   ProductName VARCHAR(100...         0 row(s) affected                                         0.032 sec
78  22:08:58  INSERT INTO Sales (ProductName, Quantity, PricePerUnit, SaleDate) VALUES ('Laptop', 2, 50000.00, '2025-...  5 row(s) affected Records: 5  Duplicates: 0  Warnings: 0  0.016 sec
79  22:10:06  SELECT COUNT(*) AS TotalSales FROM Sales LIMIT 0, 1000                                                 1 row(s) returned                                         0.015 sec / 0.000 sec
80  22:11:23  SELECT SUM(Quantity * PricePerUnit) AS TotalRevenue FROM Sales LIMIT 0, 1000                           1 row(s) returned                                         0.015 sec / 0.000 sec
81  22:13:13  SELECT AVG(PricePerUnit) AS AverageUnitPrice FROM Sales LIMIT 0, 1000                                  1 row(s) returned                                         0.000 sec / 0.000 sec
82  22:14:33  SELECT MIN(PricePerUnit) AS LowestPrice FROM Sales LIMIT 0, 1000                                       1 row(s) returned                                         0.000 sec / 0.000 sec
```

MAX() – Highest price per unit

```
SELECT MAX(PricePerUnit) AS HighestPrice FROM Sales;
```



```
SELECT COUNT(*) AS TotalSales FROM Sales;
SELECT SUM(Quantity * PricePerUnit) AS TotalRevenue FROM Sales;
SELECT AVG(PricePerUnit) AS AverageUnitPrice FROM Sales;
SELECT MIN(PricePerUnit) AS LowestPrice FROM Sales;
SELECT MAX(PricePerUnit) AS HighestPrice FROM Sales;
```

```
HighestPrice
52000.00
```

```
#   Time      Action                                                                                                   Message                                                   Duration / Fetch
78  22:08:58  INSERT INTO Sales (ProductName, Quantity, PricePerUnit, SaleDate) VALUES ('Laptop', 2, 50000.00, '2025-...  5 row(s) affected Records: 5  Duplicates: 0  Warnings: 0  0.016 sec
79  22:10:06  SELECT COUNT(*) AS TotalSales FROM Sales LIMIT 0, 1000                                                 1 row(s) returned                                         0.015 sec / 0.000 sec
80  22:11:23  SELECT SUM(Quantity * PricePerUnit) AS TotalRevenue FROM Sales LIMIT 0, 1000                           1 row(s) returned                                         0.015 sec / 0.000 sec
81  22:13:13  SELECT AVG(PricePerUnit) AS AverageUnitPrice FROM Sales LIMIT 0, 1000                                  1 row(s) returned                                         0.000 sec / 0.000 sec
82  22:14:33  SELECT MIN(PricePerUnit) AS LowestPrice FROM Sales LIMIT 0, 1000                                       1 row(s) returned                                         0.000 sec / 0.000 sec
83  22:16:02  SELECT MAX(PricePerUnit) AS HighestPrice FROM Sales LIMIT 0, 1000                                      1 row(s) returned                                         0.000 sec / 0.000 sec
```

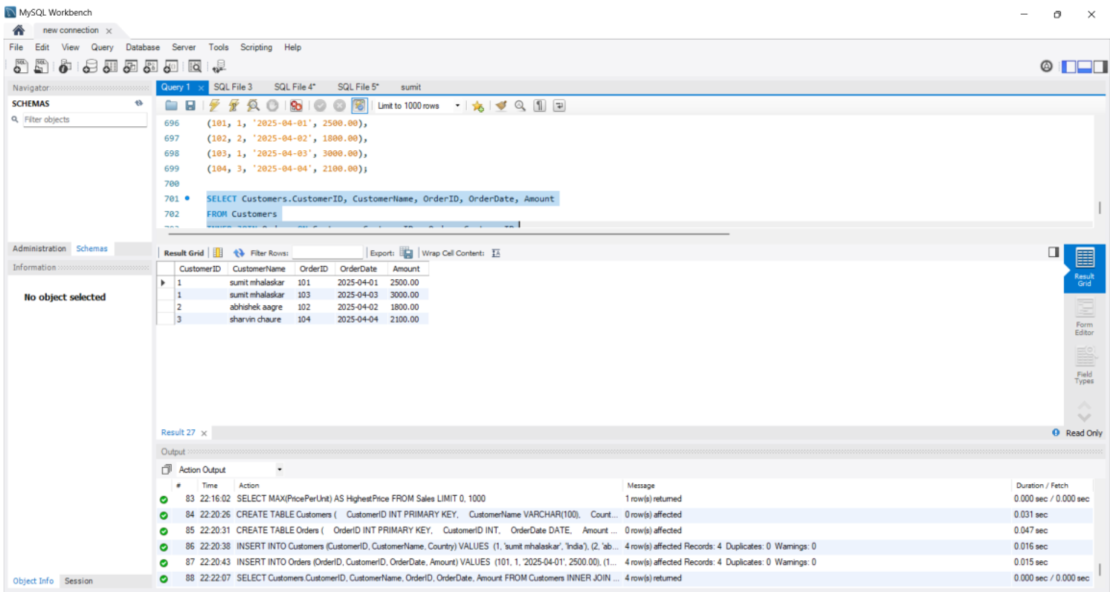
8. Given Customers and Orders tables, write SQL queries to perform INNER JOIN, LEFT
JOIN, and RIGHT JOIN to retrieve combined data for customer orders.

Ans : CREATE TABLE Customers (
```
   CustomerID INT PRIMARY KEY,
   CustomerName VARCHAR(100),
   Country VARCHAR(50)
);
CREATE TABLE Orders (
   OrderID INT PRIMARY KEY,
   CustomerID INT,
   OrderDate DATE,
   Amount DECIMAL(10, 2),
   FOREIGN KEY (CustomerID) REFERENCES Customers(CustomerID)
);
INSERT INTO Customers (CustomerID, CustomerName, Country)
VALUES
(1, 'sumit mhalaskar', 'India'),
(2, 'abhishek aagre', 'USA'),
(3, 'sharvin chaure', 'UK'),
(4, 'pratik hirave', 'India');


INSERT INTO Orders (OrderID, CustomerID, OrderDate, Amount)
VALUES
(101, 1, '2025-04-01', 2500.00),
(102, 2, '2025-04-02', 1800.00),
(103, 1, '2025-04-03', 3000.00),
(104, 3, '2025-04-04', 2100.00);
```

INNER JOIN

(Returns only matching records in both tables)

```
SELECT Customers.CustomerID, CustomerName, OrderID, OrderDate,
AmountFROM CustomersINNER JOIN Orders ON Customers.CustomerID =
Orders.CustomerID;
```



```sql
(101, 1, '2025-04-01', 2500.00),
(102, 2, '2025-04-02', 1800.00),
(103, 1, '2025-04-03', 3000.00),
(104, 3, '2025-04-04', 2100.00);

SELECT Customers.CustomerID, CustomerName, OrderID, OrderDate, Amount
FROM Customers
```

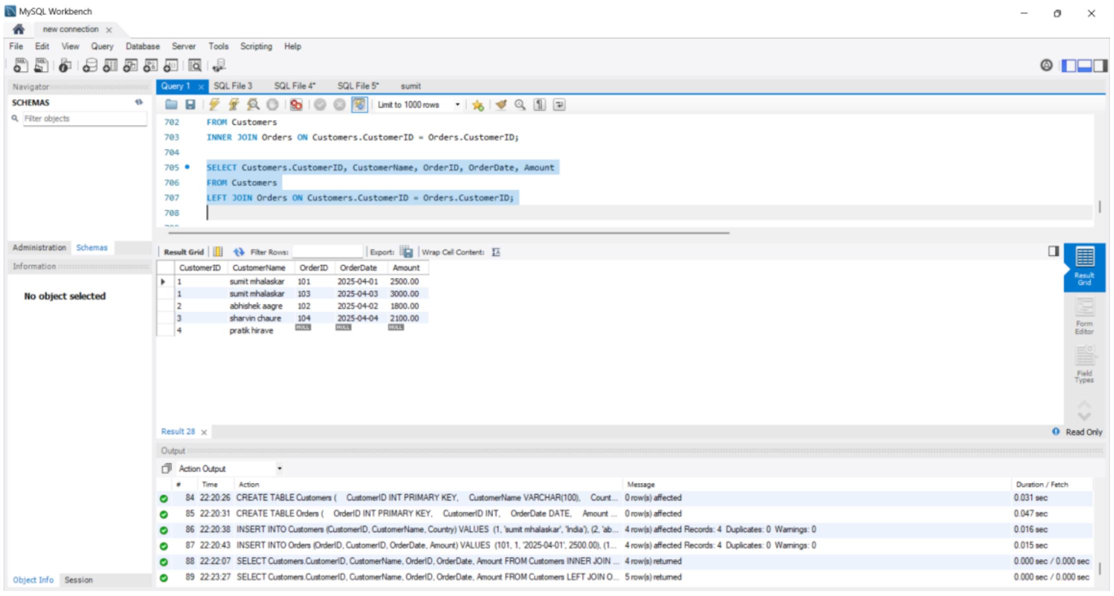
	CustomerID	CustomerName	OrderID	OrderDate	Amount
▶	1	sumit mhalaskar	101	2025-04-01	2500.00
	1	sumit mhalaskar	103	2025-04-03	3000.00
	2	abhishek aagre	102	2025-04-02	1800.00
	3	sharvin chaure	104	2025-04-04	2100.00

```
#   Time      Action                                                                                               Message                                                 Duration / Fetch
83  22:16:02  SELECT MAX(PricePerUnit) AS HighestPrice FROM Sales LIMIT 0, 1000                                    1 row(s) returned                                       0.000 sec / 0.000 sec
84  22:20:26  CREATE TABLE Customers (    CustomerID INT PRIMARY KEY,    CustomerName VARCHAR(100),    Count...     0 row(s) affected                                       0.031 sec
85  22:20:31  CREATE TABLE Orders (    OrderID INT PRIMARY KEY,    CustomerID INT,    OrderDate DATE,    Amount ...    0 row(s) affected                                       0.047 sec
86  22:20:38  INSERT INTO Customers (CustomerID, CustomerName, Country) VALUES  (1, 'sumit mhalaskar', 'India'), (2, 'ab...  4 row(s) affected Records: 4  Duplicates: 0  Warnings: 0  0.016 sec
87  22:20:43  INSERT INTO Orders (OrderID, CustomerID, OrderDate, Amount) VALUES  (101, 1, '2025-04-01', 2500.00), (1...  4 row(s) affected Records: 4  Duplicates: 0  Warnings: 0  0.015 sec
88  22:22:07  SELECT Customers.CustomerID, CustomerName, OrderID, OrderDate, Amount FROM Customers INNER JOIN ...  4 row(s) returned                                       0.000 sec / 0.000 sec
```

LEFT JOIN

(Returns all customers and their orders if any. Orders will be `NULL` if not found.)

SELECT Customers.CustomerID, CustomerName, OrderID, OrderDate, AmountFROM CustomersLEFT JOIN Orders ON Customers.CustomerID = Orders.CustomerID;



```sql
FROM Customers
INNER JOIN Orders ON Customers.CustomerID = Orders.CustomerID;

SELECT Customers.CustomerID, CustomerName, OrderID, OrderDate, Amount
FROM Customers
LEFT JOIN Orders ON Customers.CustomerID = Orders.CustomerID;
```

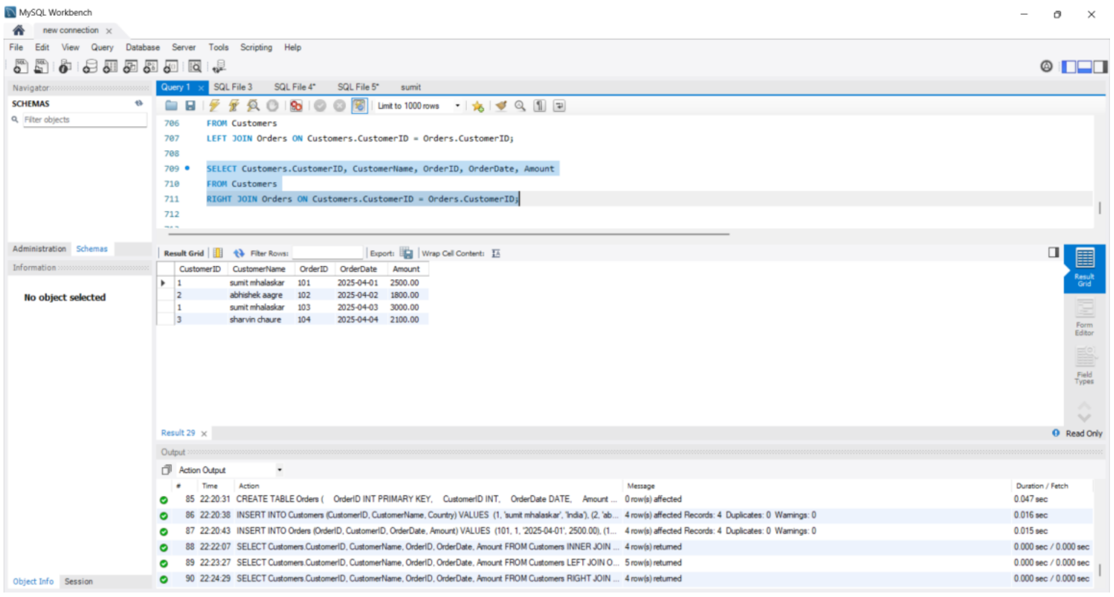
	CustomerID	CustomerName	OrderID	OrderDate	Amount
▶	1	sumit mhalaskar	101	2025-04-01	2500.00
	1	sumit mhalaskar	103	2025-04-03	3000.00
	2	abhishek aagre	102	2025-04-02	1800.00
	3	sharvin chaure	104	2025-04-04	2100.00
	4	pratik hirave	NULL	NULL	NULL

```
#   Time      Action                                                                                               Message                                                 Duration / Fetch
84  22:20:26  CREATE TABLE Customers (    CustomerID INT PRIMARY KEY,    CustomerName VARCHAR(100),    Count...     0 row(s) affected                                       0.031 sec
85  22:20:31  CREATE TABLE Orders (    OrderID INT PRIMARY KEY,    CustomerID INT,    OrderDate DATE,    Amount ...    0 row(s) affected                                       0.047 sec
86  22:20:38  INSERT INTO Customers (CustomerID, CustomerName, Country) VALUES  (1, 'sumit mhalaskar', 'India'), (2, 'ab...  4 row(s) affected Records: 4  Duplicates: 0  Warnings: 0  0.016 sec
87  22:20:43  INSERT INTO Orders (OrderID, CustomerID, OrderDate, Amount) VALUES  (101, 1, '2025-04-01', 2500.00), (1...  4 row(s) affected Records: 4  Duplicates: 0  Warnings: 0  0.015 sec
88  22:22:07  SELECT Customers.CustomerID, CustomerName, OrderID, OrderDate, Amount FROM Customers INNER JOIN ...  4 row(s) returned                                       0.000 sec / 0.000 sec
89  22:23:27  SELECT Customers.CustomerID, CustomerName, OrderID, OrderDate, Amount FROM Customers LEFT JOIN O...  5 row(s) returned                                       0.000 sec / 0.000 sec
```

RIGHT JOIN

(Returns all orders with customer info. Customer info is `NULL` if not found.)

```
SELECT Customers.CustomerID, CustomerName, OrderID, OrderDate,
AmountFROM CustomersRIGHT JOIN Orders ON Customers.CustomerID =
Orders.CustomerID;
```



```
FROM Customers
LEFT JOIN Orders ON Customers.CustomerID = Orders.CustomerID;

SELECT Customers.CustomerID, CustomerName, OrderID, OrderDate, Amount
FROM Customers
RIGHT JOIN Orders ON Customers.CustomerID = Orders.CustomerID;
```

CustomerID	CustomerName	OrderID	OrderDate	Amount
1	sumit mhalaskar	101	2025-04-01	2500.00
2	abhishek aagre	102	2025-04-02	1800.00
1	sumit mhalaskar	103	2025-04-03	3000.00
3	sharvin chaure	104	2025-04-04	2100.00

```
#   Time      Action                                                                                          Message                                                    Duration / Fetch
85  22:20:31  CREATE TABLE Orders (    OrderID INT PRIMARY KEY,    CustomerID INT,    OrderDate DATE,    Amount ...   0 row(s) affected                                          0.047 sec
86  22:20:38  INSERT INTO Customers (CustomerID, CustomerName, Country) VALUES  (1, 'sumit mhalaskar', 'India'), (2, 'ab...   4 row(s) affected Records: 4  Duplicates: 0  Warnings: 0   0.016 sec
87  22:20:43  INSERT INTO Orders (OrderID, CustomerID, OrderDate, Amount) VALUES  (101, 1, '2025-04-01', 2500.00), (1...   4 row(s) affected Records: 4  Duplicates: 0  Warnings: 0   0.015 sec
88  22:22:07  SELECT Customers.CustomerID, CustomerName, OrderID, OrderDate, Amount FROM Customers INNER JOIN ...   4 row(s) returned                                          0.000 sec / 0.000 sec
89  22:23:27  SELECT Customers.CustomerID, CustomerName, OrderID, OrderDate, Amount FROM Customers LEFT JOIN O...   5 row(s) returned                                          0.000 sec / 0.000 sec
90  22:24:29  SELECT Customers.CustomerID, CustomerName, OrderID, OrderDate, Amount FROM Customers RIGHT JOIN ...   4 row(s) returned                                          0.000 sec / 0.000 sec
```