# CSCI 5408

# DATA MANAGEMENT AND WAREHOUSING

## LAB - 4

Banner ID: B00984406
GitLab Assignment Link:
https://git.cs.dal.ca/jems/csci5408_s24_b00984406_jems_patel.git

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## DDL Commands

**Create a database called “local_lab4”:**

CREATE DATABASE IF NOT EXISTS local_lab4;

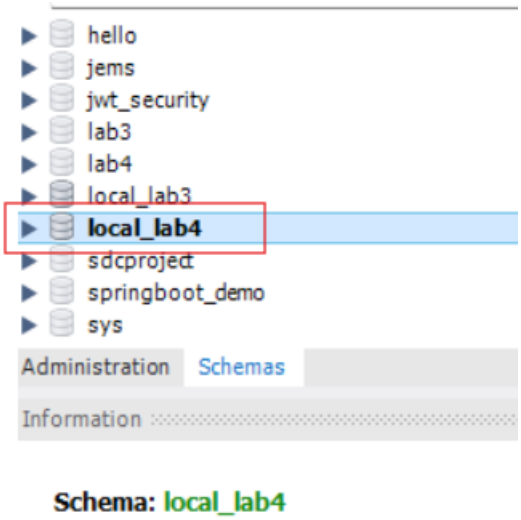



*Figure 1.1: Database local_lab4 created*

**Create a database called “remote_lab4”:**

CREATE DATABASE IF NOT EXIST remote_lab4;

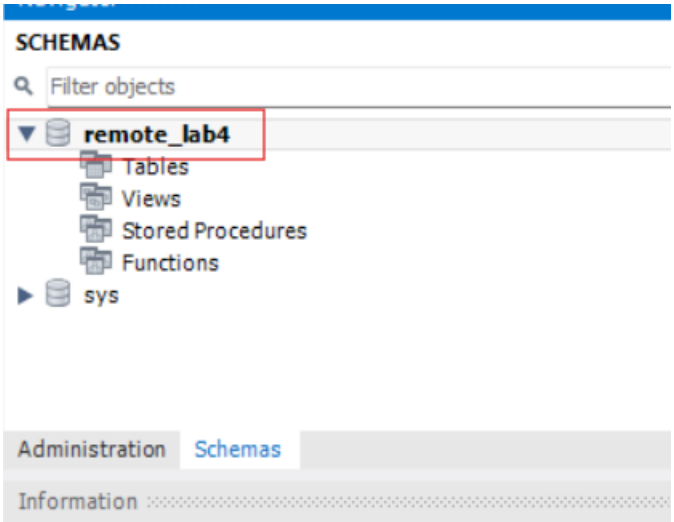



*Figure 1.2: Database remote_lab4 created*

**Create a table “user”:**

```
CREATE TABLE User (
    id INT PRIMARY KEY AUTO_INCREMENT,
    name VARCHAR(100) NOT NULL,
    email VARCHAR(100) UNIQUE NOT NULL,
    phone VARCHAR(15),
    address VARCHAR(255)
);——
```

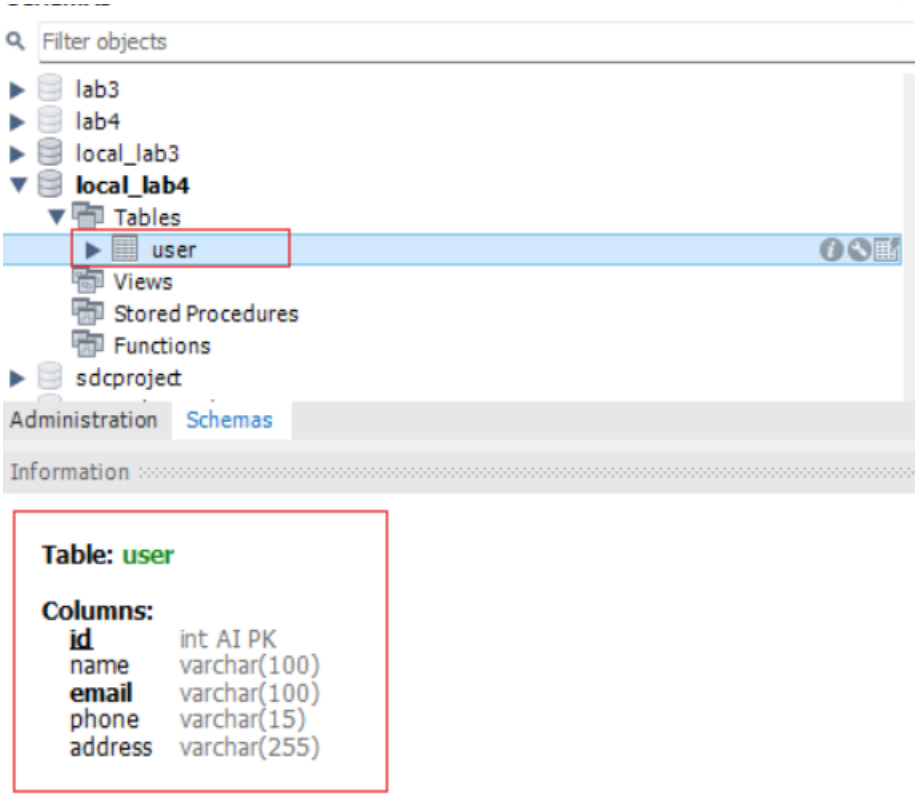



*Figure 1.3: user table created*

**Create a table “Order_info”:**

```
CREATE TABLE Order_info (
    order_id INT PRIMARY KEY AUTO_INCREMENT,
    user_id INT,
    item_name VARCHAR(100) NOT NULL,
    quantity INT NOT NULL,
    order_date DATETIME NOT NULL
);
```

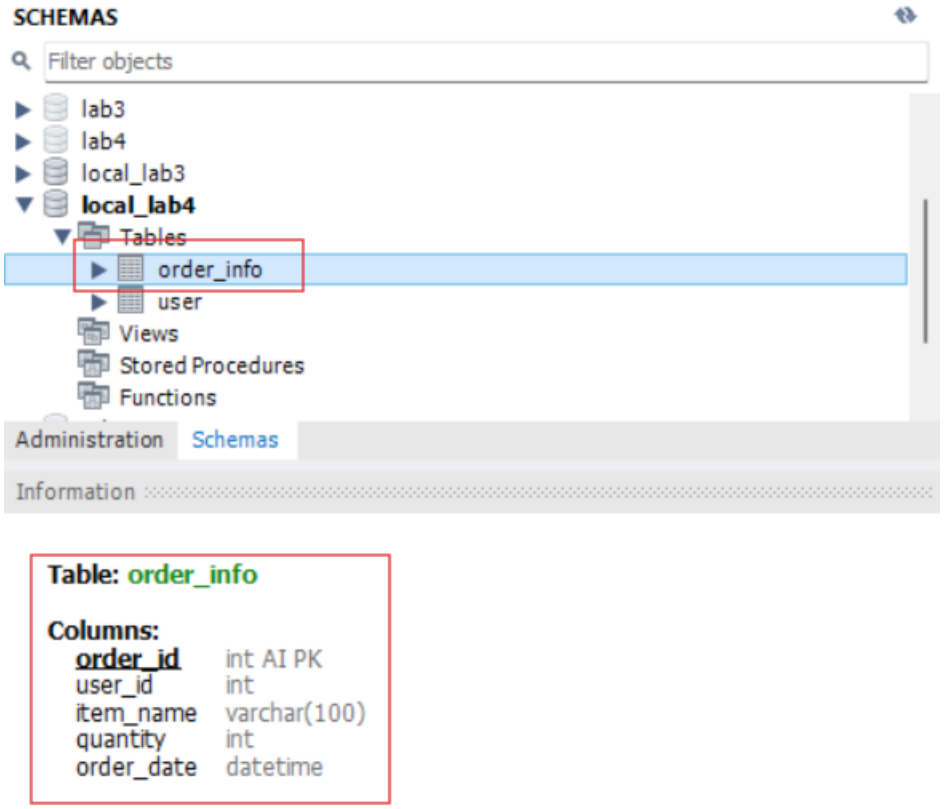



*Figure 1.4: Order_info table created*

**Create a table “Inventory”:**

```
CREATE TABLE Inventory(
item_id INT PRIMARY KEY,
item_name VARCHAR(15),
available_quantity INT
)
```

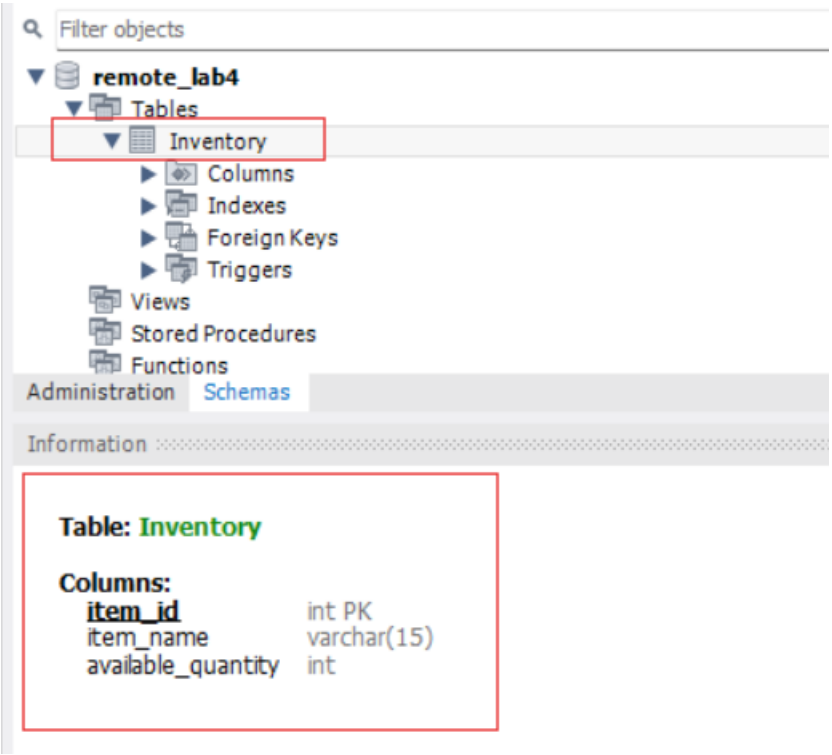



*Figure 1.5: Inventory table created*

## DML Commands

**Inserting the data into the table “user”(local_lab4):**

INSERT INTO User (name, email, phone, address) VALUES
('JEMS', 'jems007patel@gmail.com', '7828825653', '1881 Brunswick Street'),
('JOLI', 'joli130@gmail.com', '7855572425', '2001 Brunswick Street');

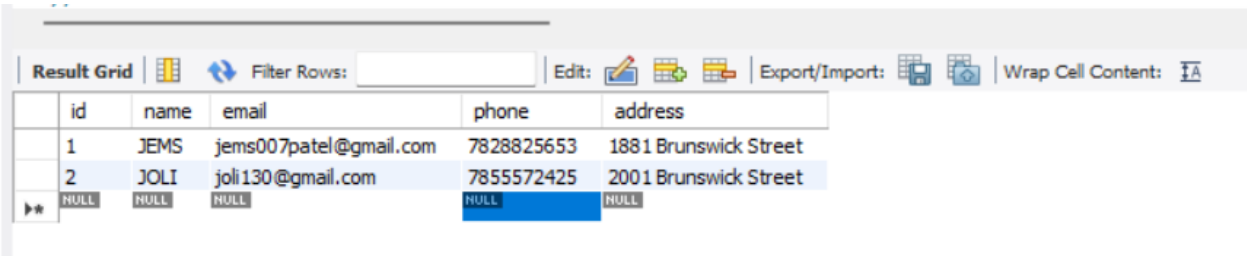



*Figure 2.1: inserting data into the customer_details table*

**Inserting the data into the table “order_info”(local_lab):**

(INSERT INTO Order_info (user_id, item_name, quantity, order_date)
VALUES (1, 'Laptop', 6, now());
INSERT INTO Order_info (user_id, item_name, quantity, order_date)
VALUES (2, 'Mobile', 10, now());

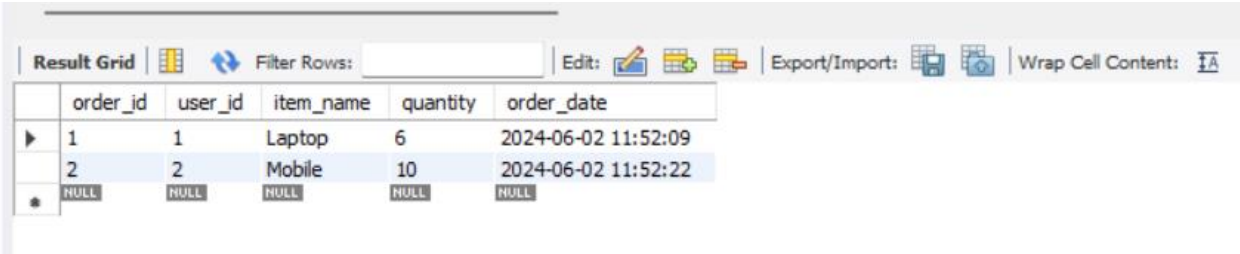



*Figure 2.2: inserting data into the order_info table*

**Inserting the data into the table “Inventory” (remote_lab):**

INSERT INTO Inventory (item_id, item_name, available_quantity)
VALUES
(1, 'Laptop', 10),
(2, 'Phone', 15);

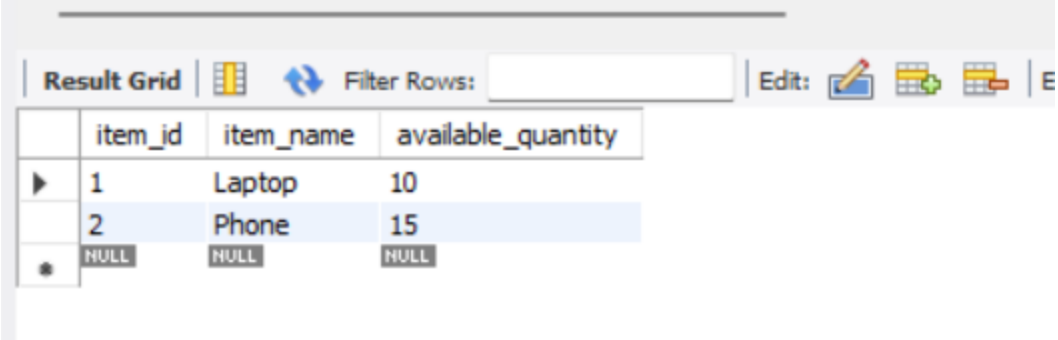



*Figure 2.3: inserting data into the Inventory*

## Step 3

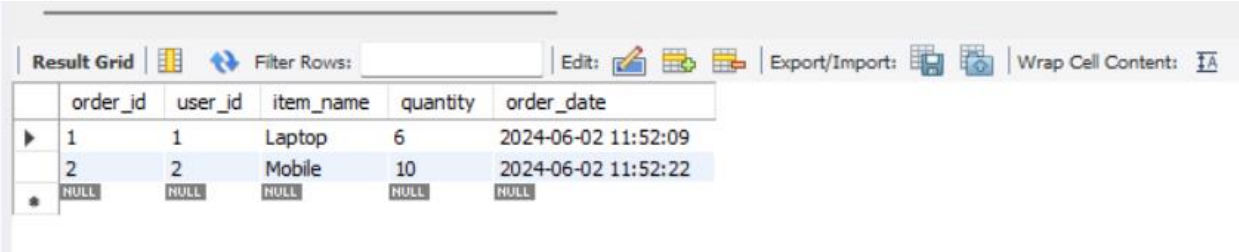
### Explanation about your program flow and what each component does.

### Program flow

Step 1 – Connection of the system with localdb and with remotedb.
Step 2 – It executes a query to retrieve data from the inventory table of remotedb and returns the fields. It is coordinated with time and the time it takes is also shown on the terminal.
Step 3 – The following step includes taking input for order placement from the users.
Step 4 – update the order_info table in localdb by inserting new order information.
Step 5 – And now the final step is done which is to update the inventory table present in the remoteDB.

**Order_info table before and after order was placed (locally):**

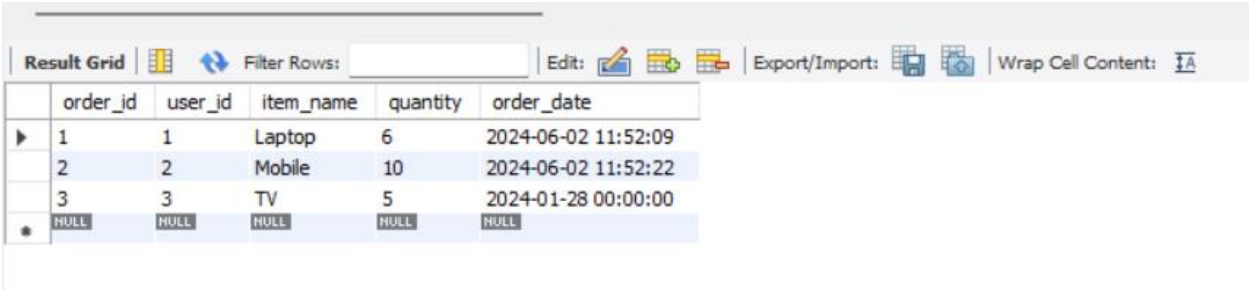
**Before:**




| order_id | user_id | item_name | quantity | order_date |
|---|---|---|---|---|
| 1 | 1 | Laptop | 6 | 2024-06-02 11:52:09 |
| 2 | 2 | Mobile | 10 | 2024-06-02 11:52:22 |
| NULL | NULL | NULL | NULL | NULL |

*Figure 3.1: order_info table before order placed*

**After:**




| order_id | user_id | item_name | quantity | order_date |
|---|---|---|---|---|
| 1 | 1 | Laptop | 6 | 2024-06-02 11:52:09 |
| 2 | 2 | Mobile | 10 | 2024-06-02 11:52:22 |
| 3 | 3 | TV | 5 | 2024-01-28 00:00:00 |
| NULL | NULL | NULL | NULL | NULL |

*Figure 3.2: order_info table after order placed*

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2023.3.2\lib\idea_rt.jar=57824:C:\
Databases connected successfully.
Item_id : 1 Item_name : Laptop Available_quantity :10
Item_id : 2 Item_name : Phone Available_quantity :15
SQL query execution time for fetching details of items : 0.006 sec
Enter item name :
TV
Enter quantity :
5
Order placed successfully.
SQL query execution time for inserting details into Order_info : 0.043 sec
No rows updated. Item not found: TV

Process finished with exit code 0
```

*Figure 3.3: Output of java code in CLI*

**Inventory table before and after order was placed (remotely):**

**Before:**

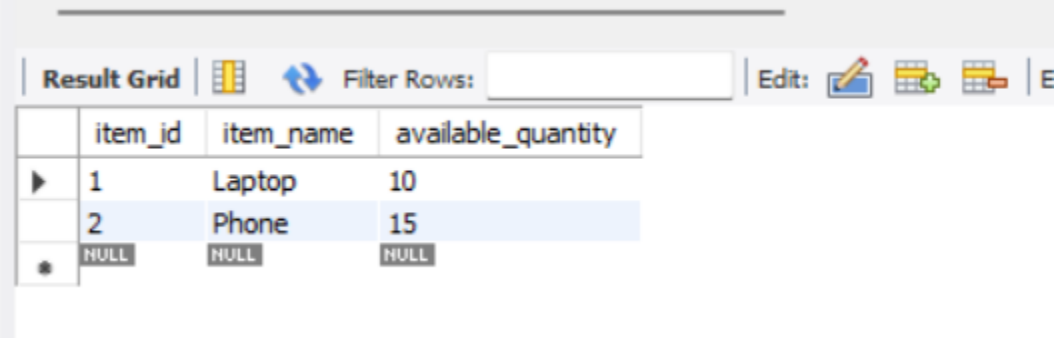



*Figure 3.4: Inventory table before order placed*

**After:**

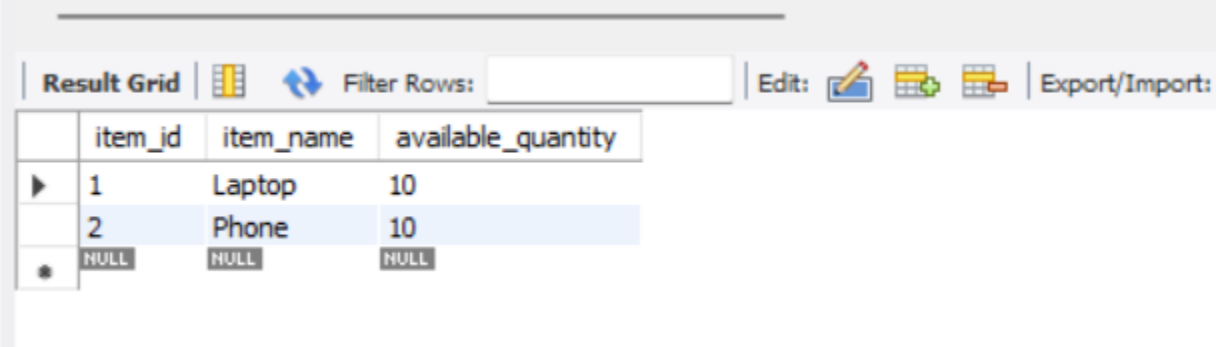



*Figure 3.5: Inventory table after order placed*

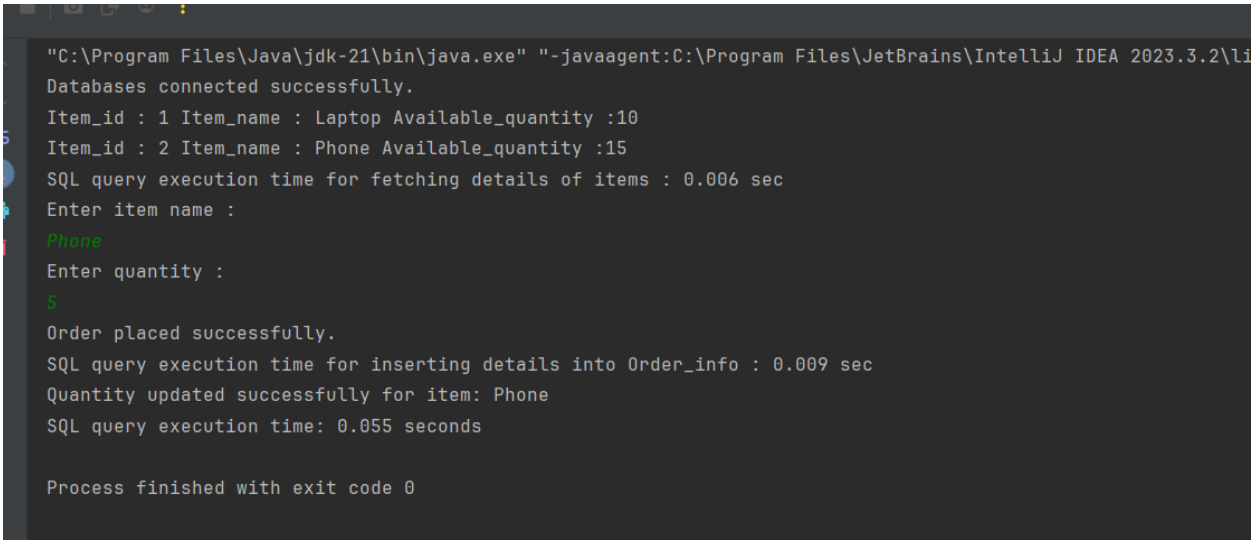



*Figure 3.6: Inventory table before order placed*

## Step 4

**Provide brief explanation about why there is a difference in the execution time for performing operation on local database and on remote database.**

The time taken when performing operations on the local database rather than the remote database is mainly attributed by the system architecture and the latency resulting from connectivity.

In the case of handling local databases, all the transactions take place on the same computer where the database exists. As a result, data is computed and collected from within the local system resource thus making it run faster in most cases. Since no data traverses through the network, the issue of latency is not prominent and there is optimized speed for the operations to be conducted.

On the other hand, when working with a remote database, operations entail the client –server communication on a network with a database server. This only added more variables that may cause a direct impact on the Execution time; these include time needed to traverse through the network, time required to go through network bandwidth, and others because of possible congestion on the network. Information must be sent from the client to the server and back to the client, which can cause time lags that can be exasperating, particularly over long distances or ineffective networking.

Additionally, remote databases can be placed on third party, isolated hosts that may be accessible by anyone or on commercial providers' data centers that can possess different performance characteristics. This can affect the general interaction with the database server and can lead to variability in time taken when compared to running the application locally from a separate access database.

In general, the role of the differences in the timing of local and remote Database Systems depends on how efficient the local resources are used in contrast with the considerations of time and resource overhead for the interaction with a network and a multi-tier server architecture in the case of a remote Database System.

**NOTE:**

**In the Java code, I use a simple IntelliJ project, and I have also provided the MySQL Connector JAR file in the GitLab repository.**