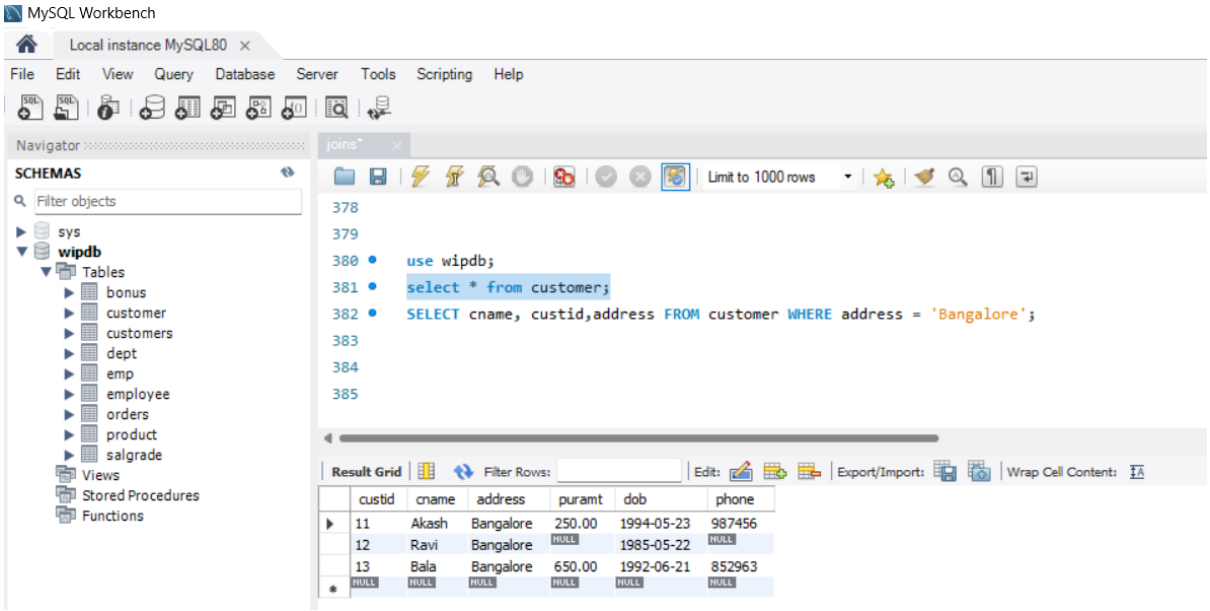
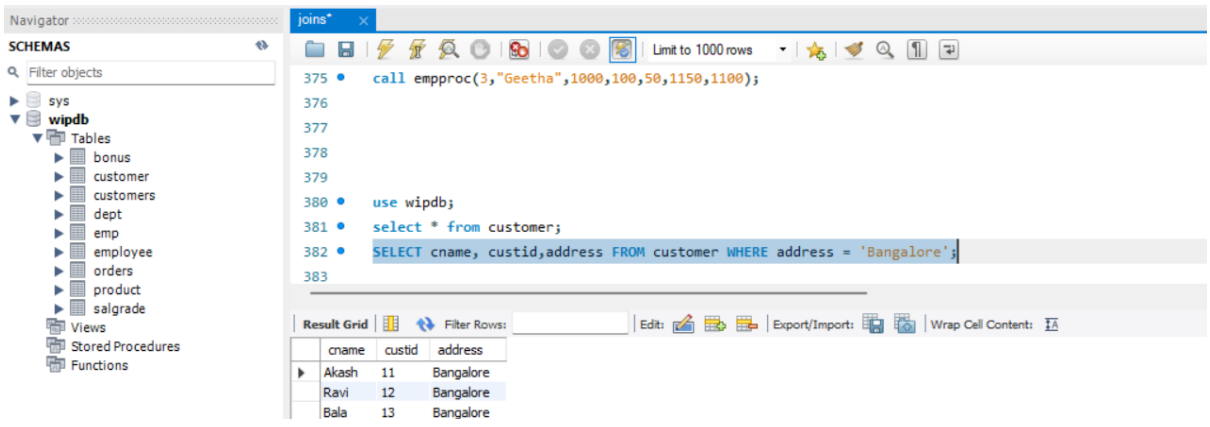
Assignment 1: Write a SELECT query to retrieve all columns from a 'customers' table, and modify it to return only the customer name and email address for customers in a specific city.

use wipdb;

select * from customer;

SELECT cname, custid,address FROM customer WHERE address = 'Bangalore';





Assignment 2: Craft a query using an INNER JOIN to combine 'orders' and 'customers' tables for customers in a specified region, and a LEFT JOIN to display all customers including those without orders.

```
SELECT customers.customer_id, customers.customer_name, customers.region, orders.order_id,
orders.order_date

FROM customers

INNER JOIN orders ON customers.customer_id = orders.customer_id

WHERE customers.region = 'ap';
```

```
SELECT customers.customer_id, customers.customer_name, customers.region, orders.order_id,
orders.order_date

FROM customers

LEFT JOIN orders ON customers.customer_id = orders.customer_id;
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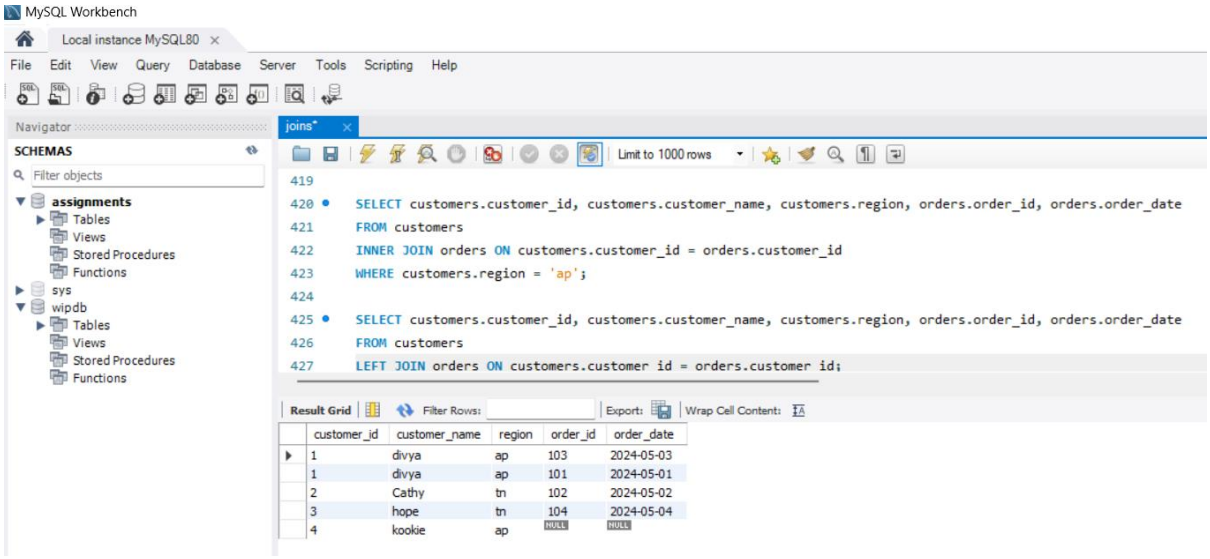
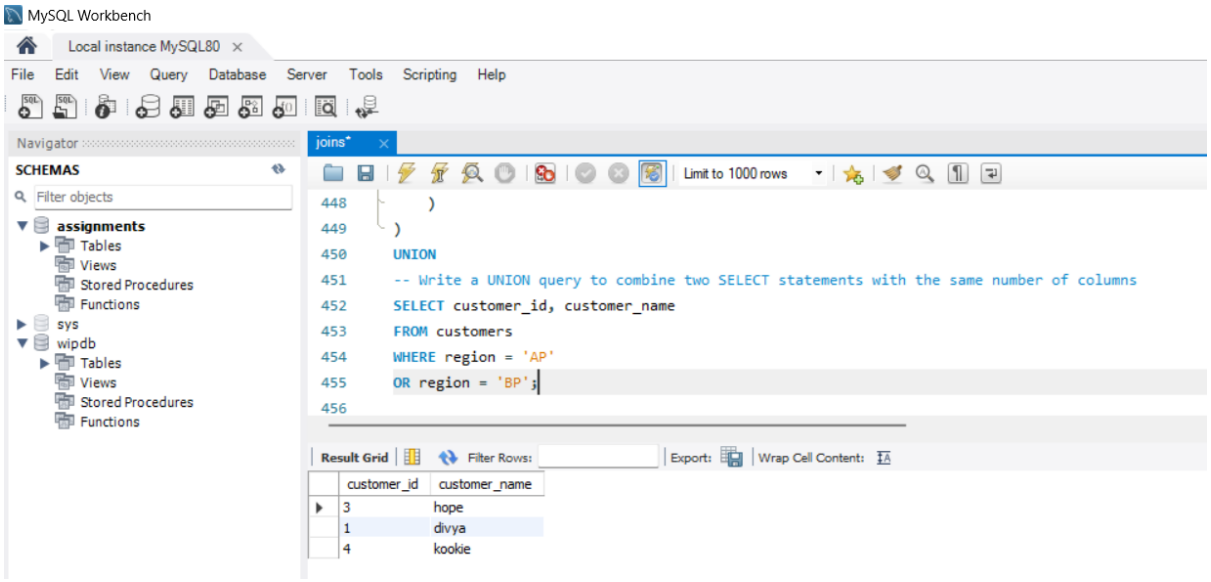
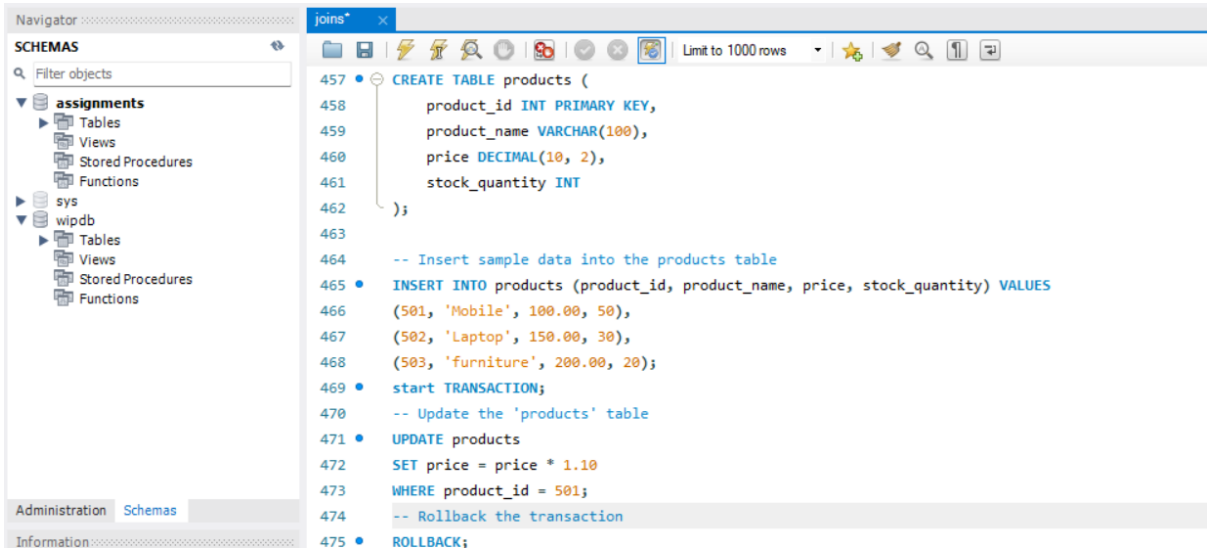


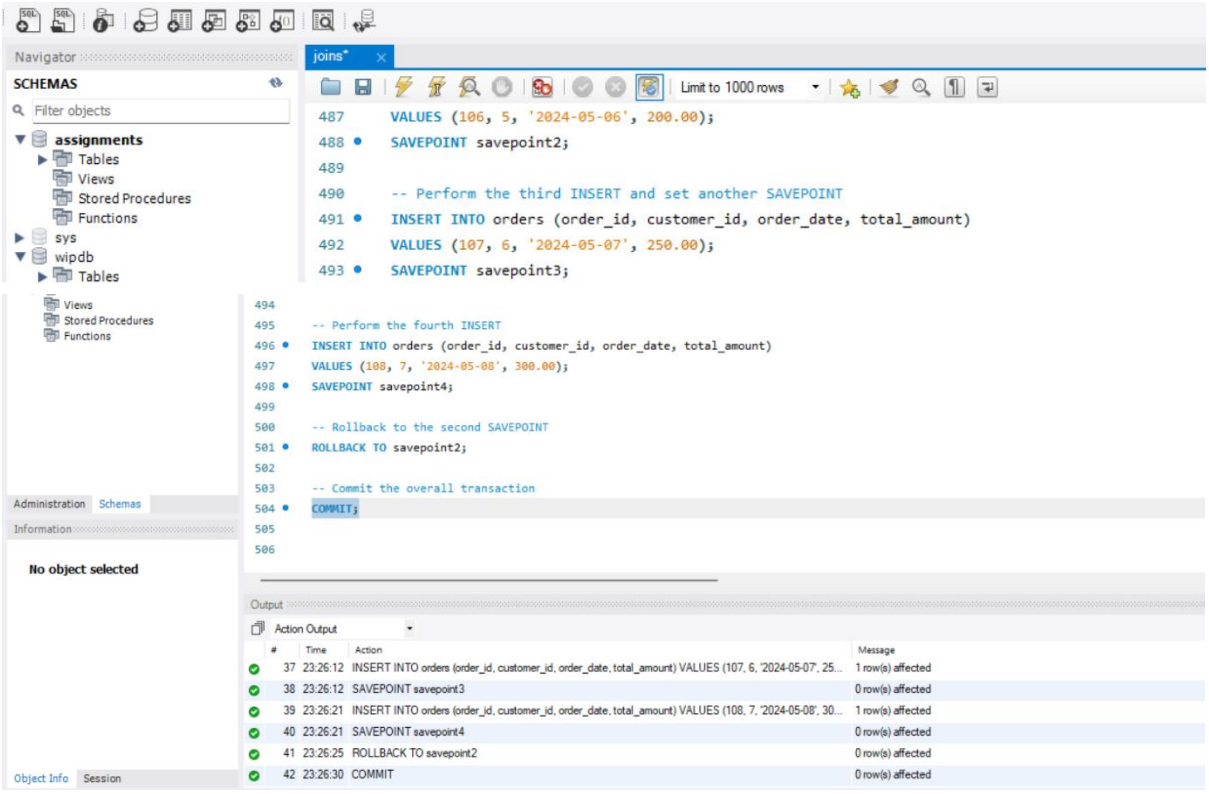
Assignment 3: Utilize a subquery to find customers who have placed orders above the average order value, and write a UNION query to combine two SELECT statements with the same number of columns.



Assignment 4: Compose SQL statements to BEGIN a transaction, INSERT a new record into the 'orders' table, COMMIT the transaction, then UPDATE the 'products' table, and ROLLBACK the transaction.



Assignment 5: Begin a transaction, perform a series of INSERTs into 'orders', setting a SAVEPOINT after each, rollback to the second SAVEPOINT, and COMMIT the overall transaction.



Assignment 6: Draft a brief report on the use of transaction logs for data recovery and create a hypothetical scenario where a transaction log is instrumental in data recovery after an unexpected shutdown.

Transaction logs play a crucial role in ensuring data integrity and facilitating data recovery in the event of unexpected system failures or shutdowns. These logs record all transactions performed on a database system, providing a detailed history of changes made to the data. In this report, we will explore the importance of transaction logs in data recovery and illustrate their significance through a hypothetical scenario.

Importance of Transaction Logs for Data Recovery: Transaction logs serve as a reliable mechanism for recovering data to a consistent state following system failures, such as power outages, hardware malfunctions, or software crashes. By recording each transaction in real-time or near-real-time, transaction logs enable the reconstruction of the database to a point-in-time before the failure occurred. This ensures that data remains consistent and accurate, minimizing the risk of data loss or corruption.

Scenario: Imagine a scenario in which a large e-commerce platform experiences an unexpected system shutdown during peak hours due to a sudden power outage. As a result of the shutdown, several ongoing transactions were left incomplete, leaving the database in an inconsistent state.

Upon restarting the system, the database administrator (DBA) initiates the recovery process using transaction logs. The transaction logs, which have been continuously capturing all transactions, provide a detailed record of the changes made to the database up to the moment of the shutdown.

The DBA begins the recovery process by analyzing the transaction logs and identifying the point-in-time at which the system failed. Using this information, they utilize database management tools to replay the transactions from the logs and roll back any incomplete or uncommitted transactions.

As the transactions are replayed and applied to the database, the system gradually returns to a consistent state, ensuring that all data remains intact and accurate. Once the recovery process is complete, the e-commerce platform is back online, and users can resume their transactions without experiencing any data loss or inconsistencies.

Conclusion: Transaction logs serve as a critical component of data recovery strategies, enabling organizations to restore databases to a consistent state following unexpected system failures. By maintaining a comprehensive record of transactions, transaction logs ensure data integrity and minimize the impact of disruptions on business operations. As demonstrated in the hypothetical scenario, the effective use of transaction logs can facilitate swift and reliable data recovery, helping organizations mitigate the risks associated with system downtime.