

Transaction(s):

```
conn.start_transaction(isolation_level='READ COMMITTED')
```

```
# --- Advanced query 1: Aggregate rentals per garage ---
cur.execute("""
SELECT g.GarageId, COUNT(r.RentalId) AS total_rentals
FROM Garages g
LEFT JOIN Rentals r ON g.GarageId = r.GarageId
JOIN GarageLocation gl ON g.Latitude = gl.Latitude AND g.Longitude = gl.Longitude
WHERE gl.City = %s
GROUP BY g.GarageId
""", (city,))
```

```
# --- Advanced query 2: Rental with highest total cost for each garage ---
cur.execute("""
SELECT g.GarageId, r.RentalId, r.TotalCost, r.StartTime, r.EndTime
FROM Rentals r
JOIN CarData c ON r.CarId = c.CarId
JOIN Garages g ON c.GarageId = g.GarageId
JOIN GarageLocation gl ON g.Latitude = gl.Latitude AND g.Longitude = gl.Longitude
WHERE gl.City = %s AND r.TotalCost = (
    SELECT MAX(r2.TotalCost)
    FROM Rentals r2
    JOIN CarData c2 ON r2.CarId = c2.CarId
    WHERE c2.GarageId = g.GarageId
)
ORDER BY g.GarageId
""", (city,))
```

Trigger: Trigger to maintain real-time Garage profits after rental transactions.

```
DELIMITER $$
```

```
CREATE TRIGGER after_rental_insert
AFTER INSERT ON Rentals
FOR EACH ROW
BEGIN
```

```
UPDATE Garages
SET Profit = COALESCE(Profit, 0) + NEW.TotalCost
WHERE GarageId = NEW.GarageId;
END$$
```

```
DELIMITER ;
```

Stored procedure(s):

```
CREATE DEFINER=`root`@`%` PROCEDURE `GetCustomerRentalSummaryById`(IN
p_CustomerId INT)
BEGIN
    DECLARE customerTotalSpending DECIMAL(10,2);

    -- customer's total spending
    SELECT COALESCE(SUM(r.TotalCost), 0)
    INTO customerTotalSpending
    FROM Rentals r
    WHERE r.CustomerId = p_CustomerId;

    -- rank
    SELECT main.CustomerId,
           main.CustomerName,
           main.TotalSpending,
           main.AverageRating,
           CASE WHEN main.NumberOfCustomersWithHigherSpending IS NULL THEN 1
                ELSE main.NumberOfCustomersWithHigherSpending + 1
           END AS CustomerSpendingRank
    FROM (
        SELECT c.CustomerId,
               c.Name AS CustomerName,
               COALESCE(SUM(r.TotalCost), 0) AS TotalSpending,
               COALESCE(AVG(cs.Rating), 0) AS AverageRating,
               (
                   SELECT COUNT(DISTINCT c2.CustomerId)
                   FROM Customers c2
                   JOIN Rentals r2 ON c2.CustomerId = r2.CustomerId
                   GROUP BY c2.CustomerId
                   HAVING SUM(r2.TotalCost) > customerTotalSpending
               )
    )
```

```
    ) AS NumberOfCustomersWithHigherSpending
FROM Customers c
LEFT JOIN Rentals r ON c.CustomerId = r.CustomerId
LEFT JOIN CustomerSatisfaction cs ON r.RentalId = cs.RentalId
WHERE c.CustomerId = p_CustomerId
GROUP BY c.CustomerId, c.Name
) AS main;
END
```