DATA 4330 – Chapter 3 & 4 – Lab #2

Use the Antique Dataset to answer the following coding questions:

*For full credit, submit both your **coding answers** along with a **snipped image of your code output that adheres to screenshot requirements**. Both below examples qualify for the requirements. Also, some questions require explanations, in addition to code and code output.

An example is provided below:

This lab incorporates the DPC Antiques dataset that is used throughout this module. Your instructor will provide you with the DDL (CREATE TABLE) and DML (INSERT INTO) text files necessary to load the database.

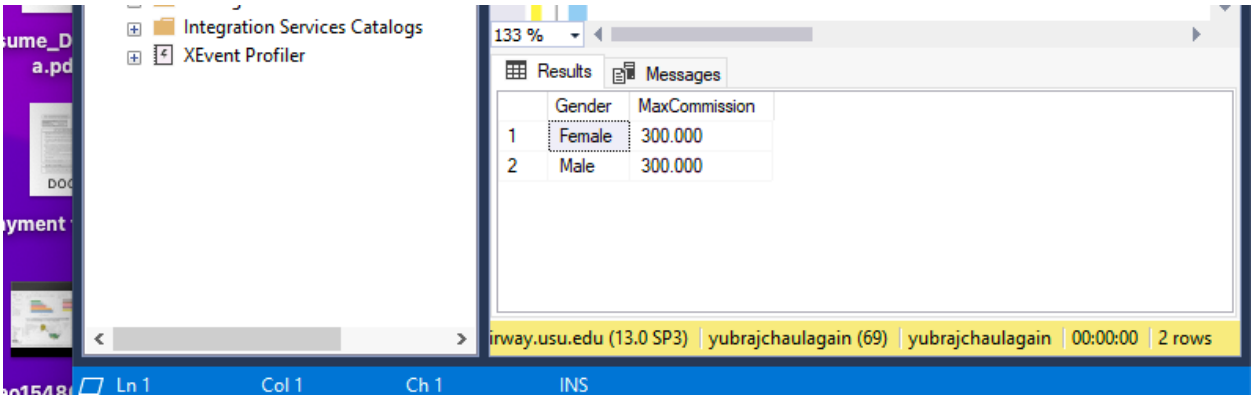
Part 1 - Joins

1. Write a query that shows the highest employee commission broken down by gender. Don't include groups with less than $100 max commission. (Hint: Commission is calculated by (quantity*unitprice*.1).

SELECT

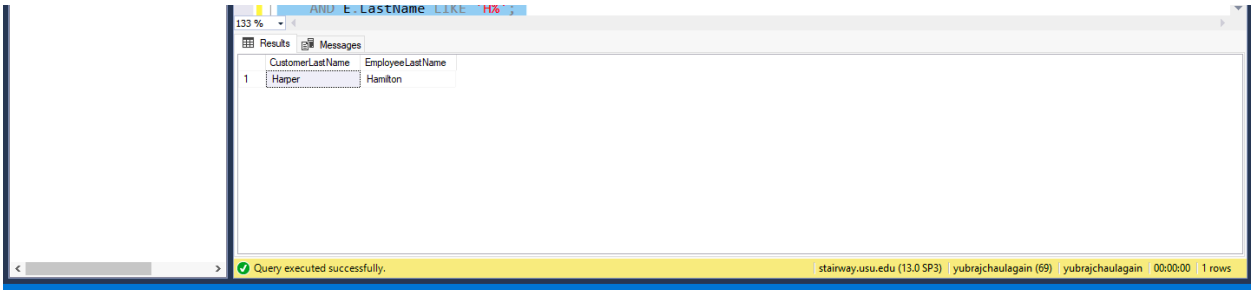
```
    E.Gender,
    MAX(SI.Quantity * SI.UnitPrice * 0.1) AS MaxCommission
FROM
    SALE AS S
JOIN
    SALE_ITEM AS SI ON S.SaleID = SI.SALEID JOIN EMPLOYEE AS E ON
E.EmployeeID = S.EmployeeID


GROUP BY
    E.Gender
HAVING
    MAX(SI.Quantity * SI.UnitPrice * 0.1) >= 100;
```



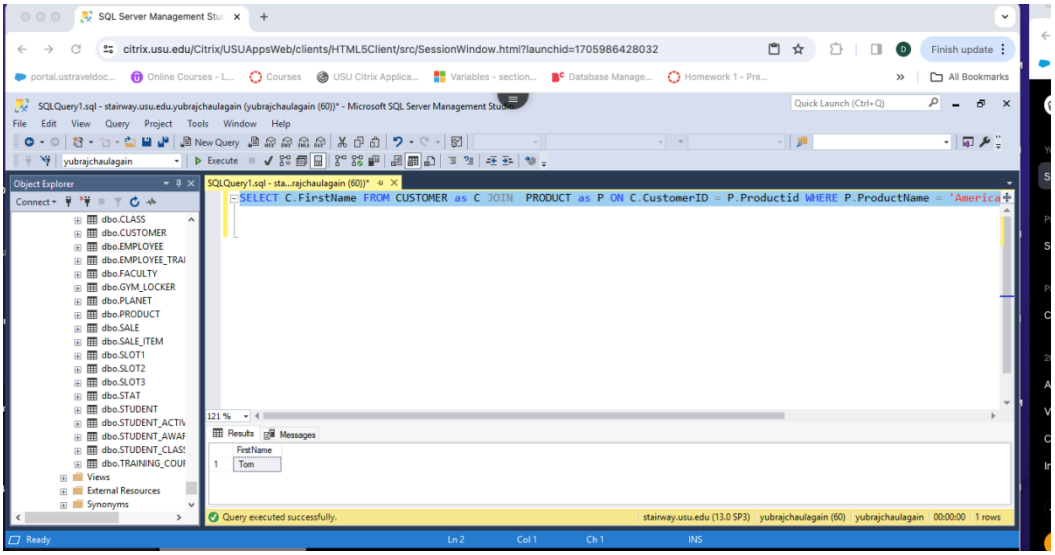
2. List the last name of both the last name of the customer and employee where an employee sold an item to a customer with a last name starting with the letter ‘H’. Use an appropriate alias even though you are not including an aggregate function.

```
SELECT
    C.LastName AS CustomerLastName,
E.LastName AS EmployeeLastName
FROM
CUSTOMER as C
JOIN
SALE as S ON C.CustomerID = S.CustomerID
JOIN
EMPLOYEE as E  ON S.EmployeeID = E.EmployeeID
WHERE
 C.LastName LIKE 'H%'
AND E.LastName LIKE 'H%';
```



3. Write a query that shows the first name of the customer who bought a product with a product name of ‘American Silver Eagle’. Do not include duplicate values.

```
SELECT C.FirstName FROM CUSTOMER as C JOIN  PRODUCT as P ON
C.CustomerID = P.Productid WHERE P.ProductName = 'American Silver Eagle';
```



4. List the Last Name, First Name, and average commission of each employee. Sort from highest commission to lowest. Use an alias where appropriate. Make the commission output in currency format. If you encounter an error, it's probably related to the ORDER BY clause. Try doing an order by without using an alias. (Hint: This will require a 3 table join, Commission is calculated by (quantity*unitprice*.1).

```
SELECT

    E.LastName,

    E.FirstName,

    FORMAT(AVG(SI.Quantity * SI.UnitPrice * 0.1), 'C', 'en-US') AS AverageCommission

FROM

    Employee AS E
```

JOIN

Sale AS S ON E.EmployeeID = S.EmployeeID

JOIN

Sale_Item AS SI ON S.SaleID = SI.SaleID

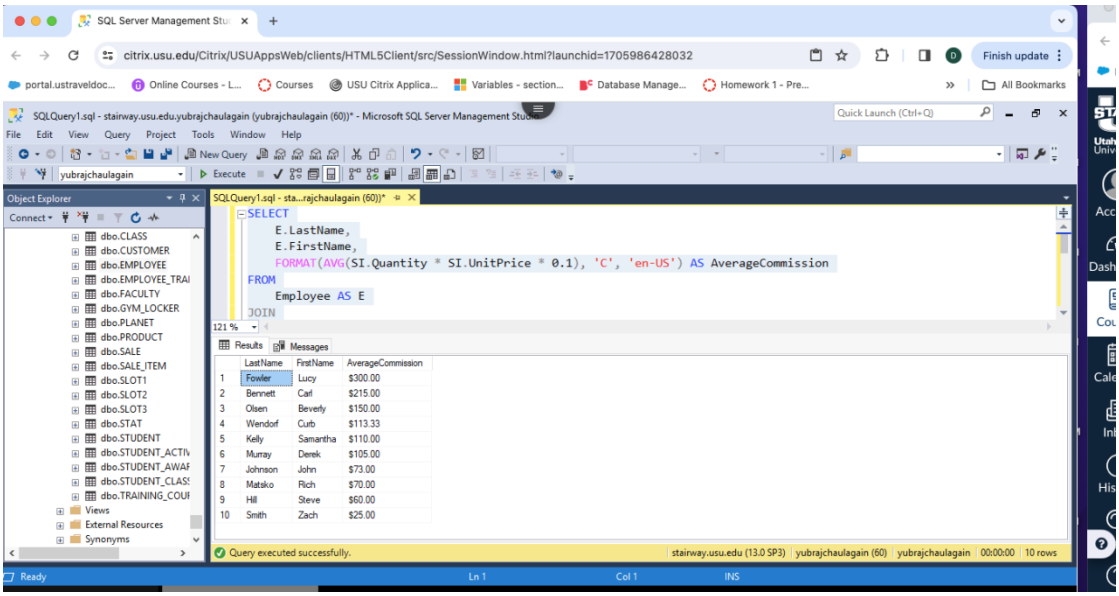
GROUP BY

E.LastName,

E.FirstName

ORDER BY

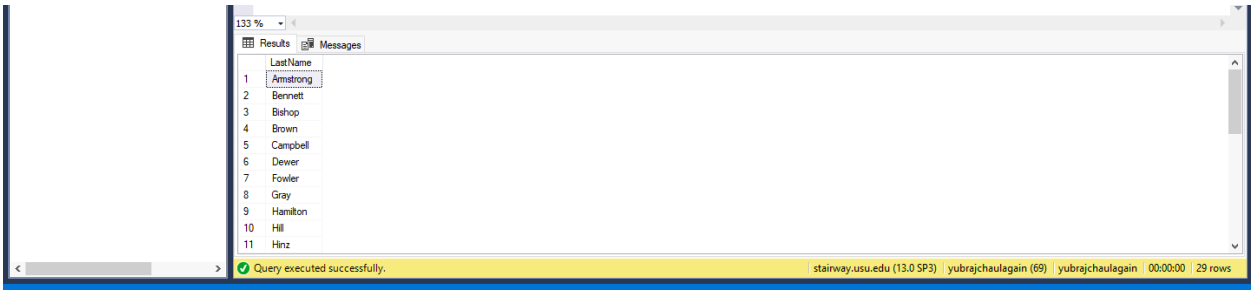
AVG(SI.Quantity * SI.UnitPrice * 0.1) DESC;



5. -- **Write a count aggregate** with a Left OUTER JOIN to show each employees' last name, and the number of times they have enrolled in a

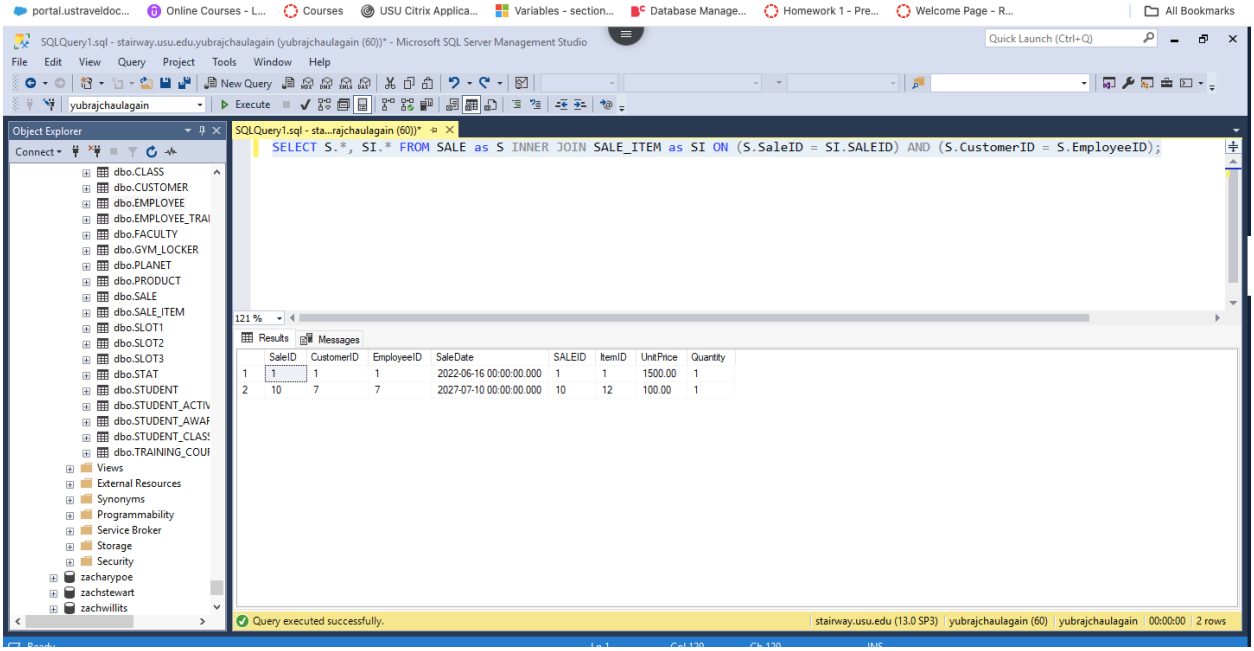
training course Use the EMPLOYEE and EMPLOYEE_TRAINING Tables to code the solution.

```
 SELECT
   E.LastName,
FROM
   EMPLOYEE AS E
LEFT JOIN
   EMPLOYEE_TRAINING AS ET ON E.EmployeeID = ET.EmployeeID
GROUP BY
   E.LastName;
```



6. First, write an INNER JOIN that connects the SALE and SALE_Item tables. Then write an additional ON clause shows any sales where customer and employees IDs are the same to create a **COMPOSITE JOIN**.

SELECT S.*, SI.* FROM SALE as S INNER JOIN SALE_ITEM as SI ON (S.SaleID = SI.SALEID) AND (S.CustomerID = S.EmployeeID);

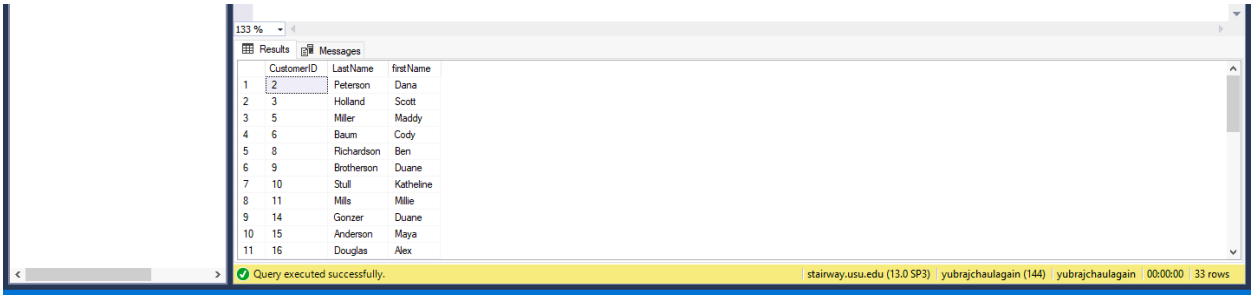


7. --Return customers who have not yet made a purchase (Use the Customer and Sale Table) and use a LEFT OUTER JOIN.

SELECT c.CustomerID, c.LastName, c.firstName

FROM CUSTOMER c LEFT OUTER JOIN SALE s ON c.CustomerID = s.CustomerID

WHERE s.CustomerID IS NULL;



133 %

Results | Messages

	CustomerID	LastName	firstName
1	2	Peterson	Dana
2	3	Holland	Scott
3	5	Miller	Maddy
4	6	Baum	Cody
5	8	Richardson	Ben
6	9	Brotherson	Duane
7	10	Stull	Katheline
8	11	Mills	Millie
9	14	Gonzer	Duane
10	15	Anderson	Maya
11	16	Douglas	Alex

Query executed successfully. | stairway.usu.edu (13.0 SP3) | yubrajchaulagain (144) | yubrajchaulagain | 00:00:00 | 33 rows

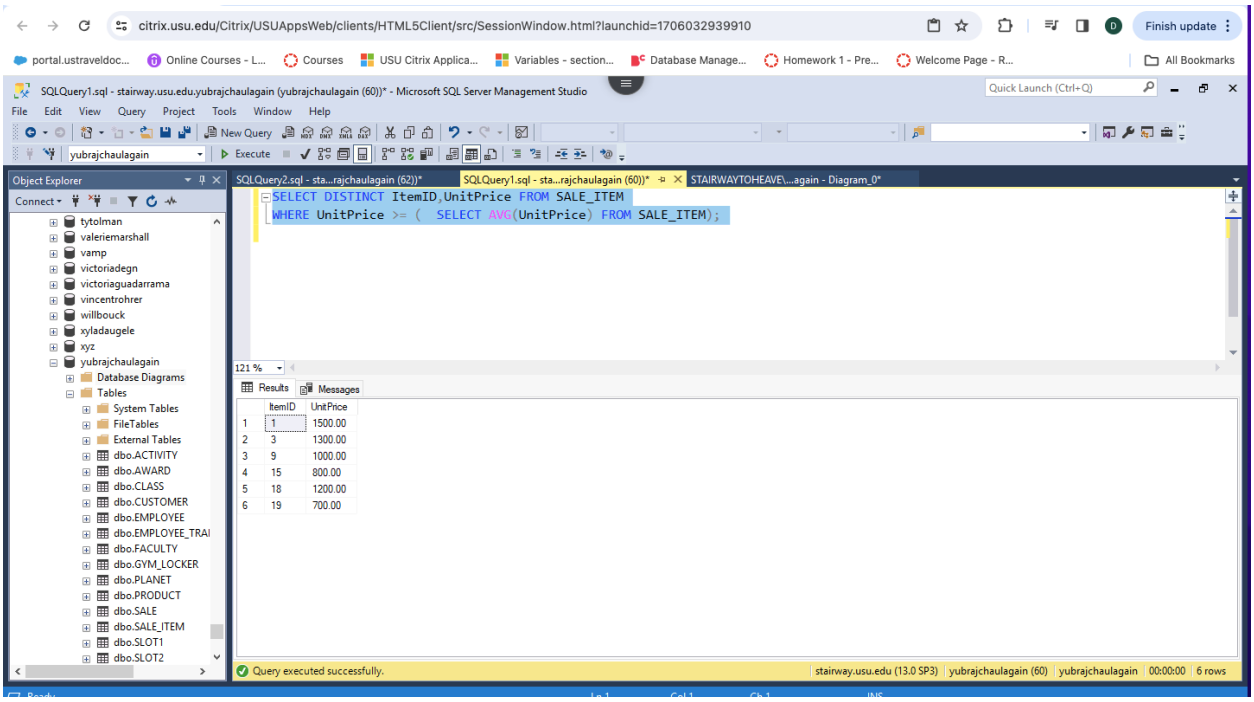
Sample Output:

Part 2 - Subqueries

8. Write a Subquery that shows the product ID and unitprice price of any products that are GREATER than or EQUAL to the current average unit price. Don’t include duplicate output.

   SELECT DISTINCT ItemID,UnitPrice FROM SALE_ITEM

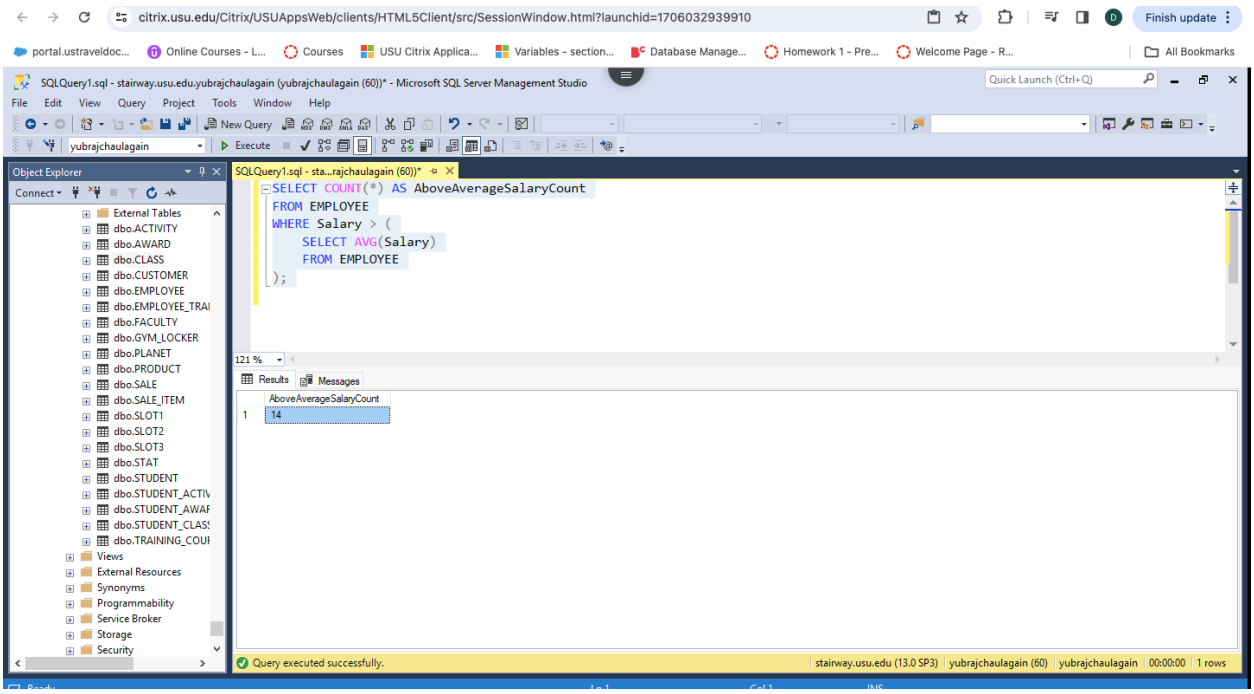
WHERE UnitPrice >= (SELECT AVG(UnitPrice) FROM SALE_ITEM);



9. Write an SQL statement that counts the number of employees that make an above average salary.

SELECT COUNT(*) AS AboveAverageSalaryCount FROM EMPLOYEE WHERE Salary > (

SELECT AVG(Salary) FROM EMPLOYEE);



10. Write an SQL statement that displays gender, and separately counts and displays the number of male and female (use a GROUP BY) employees that make an above average salary. Don't include groups that are less than 2.

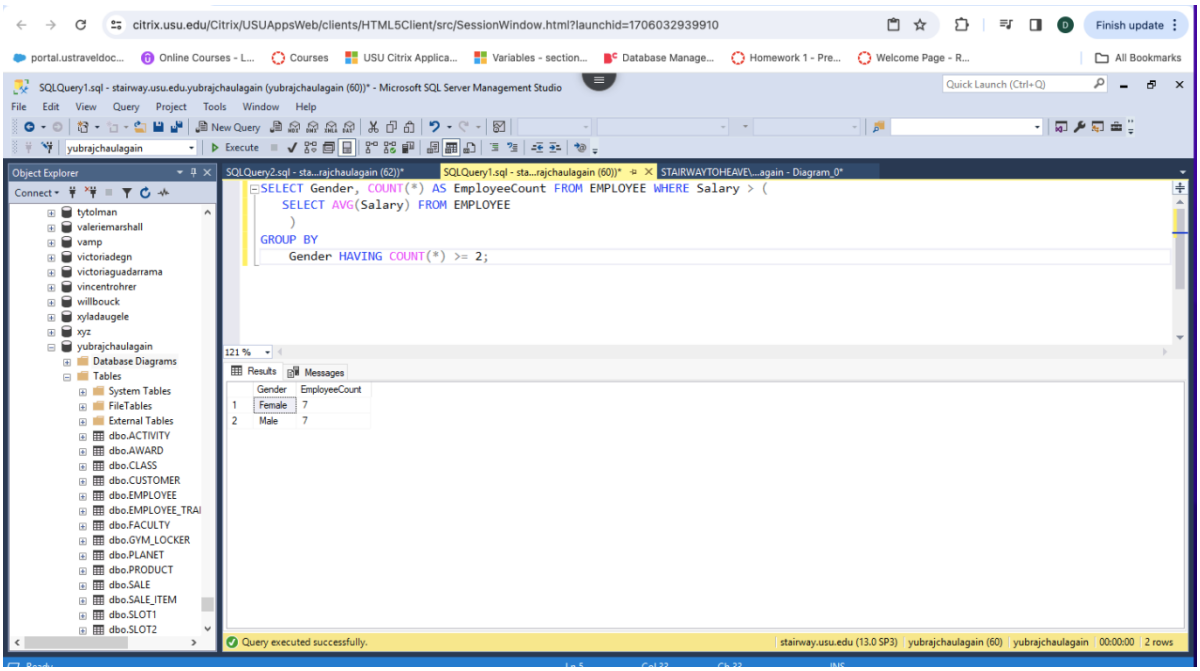
SELECT Gender, COUNT(*) AS EmployeeCount FROM EMPLOYEE WHERE Salary > (

SELECT AVG(Salary) FROM EMPLOYEE

)

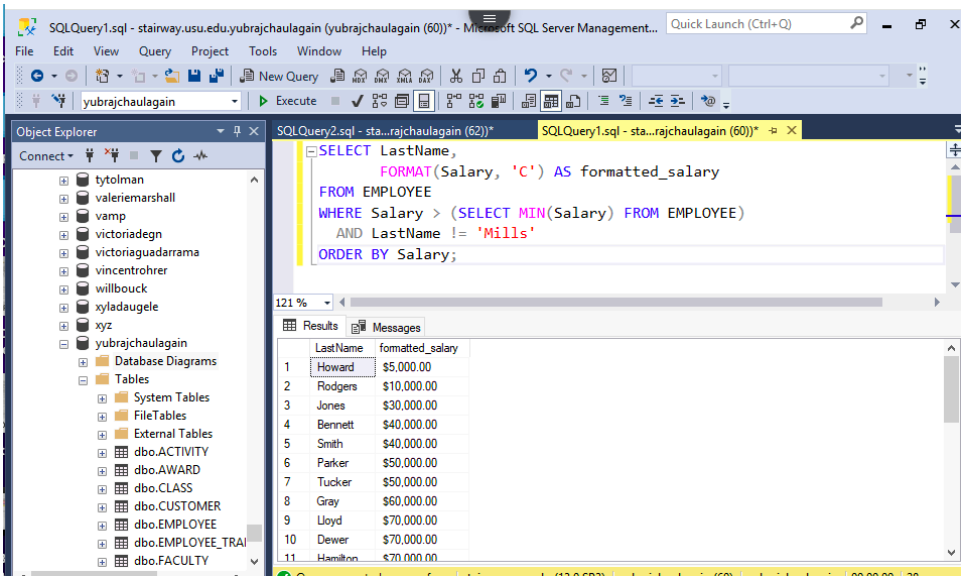
GROUP BY

Gender HAVING COUNT(*) >= 2;



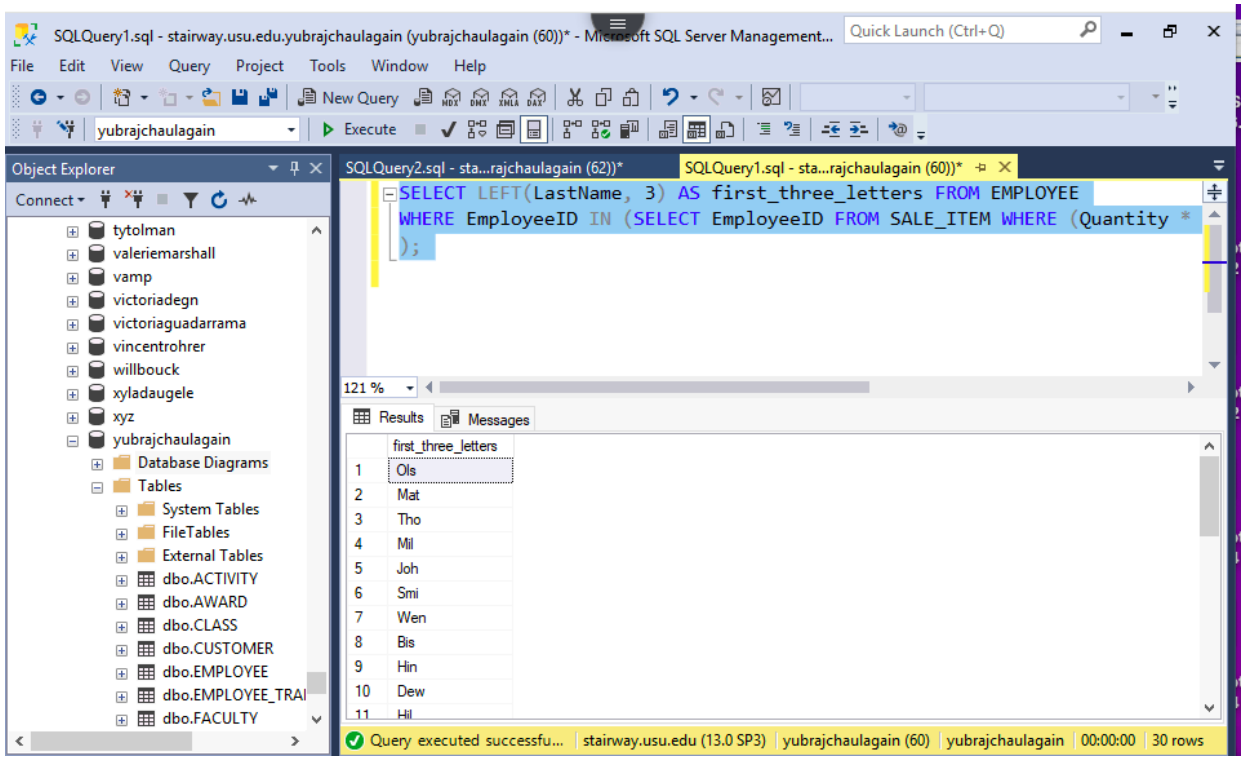
11. Write a Subquery that shows the last name and salary of employees that make over $25,000 the minimum salary of all employees. Don't include the employee with the last name 'Mills' in the output. Format the Salary output to currency (i.e., $100,000.00) and order output from smallest to largest. If you encounter an error, it's probably related to the ORDER BY clause. Try doing an order by without using an alias.

```
SELECT LastName, FORMAT(Salary, 'C') AS formatted_salary
FROM EMPLOYEE
WHERE Salary > (SELECT MIN(Salary) FROM EMPLOYEE)
  AND LastName != 'Mills'
ORDER BY Salary;
```



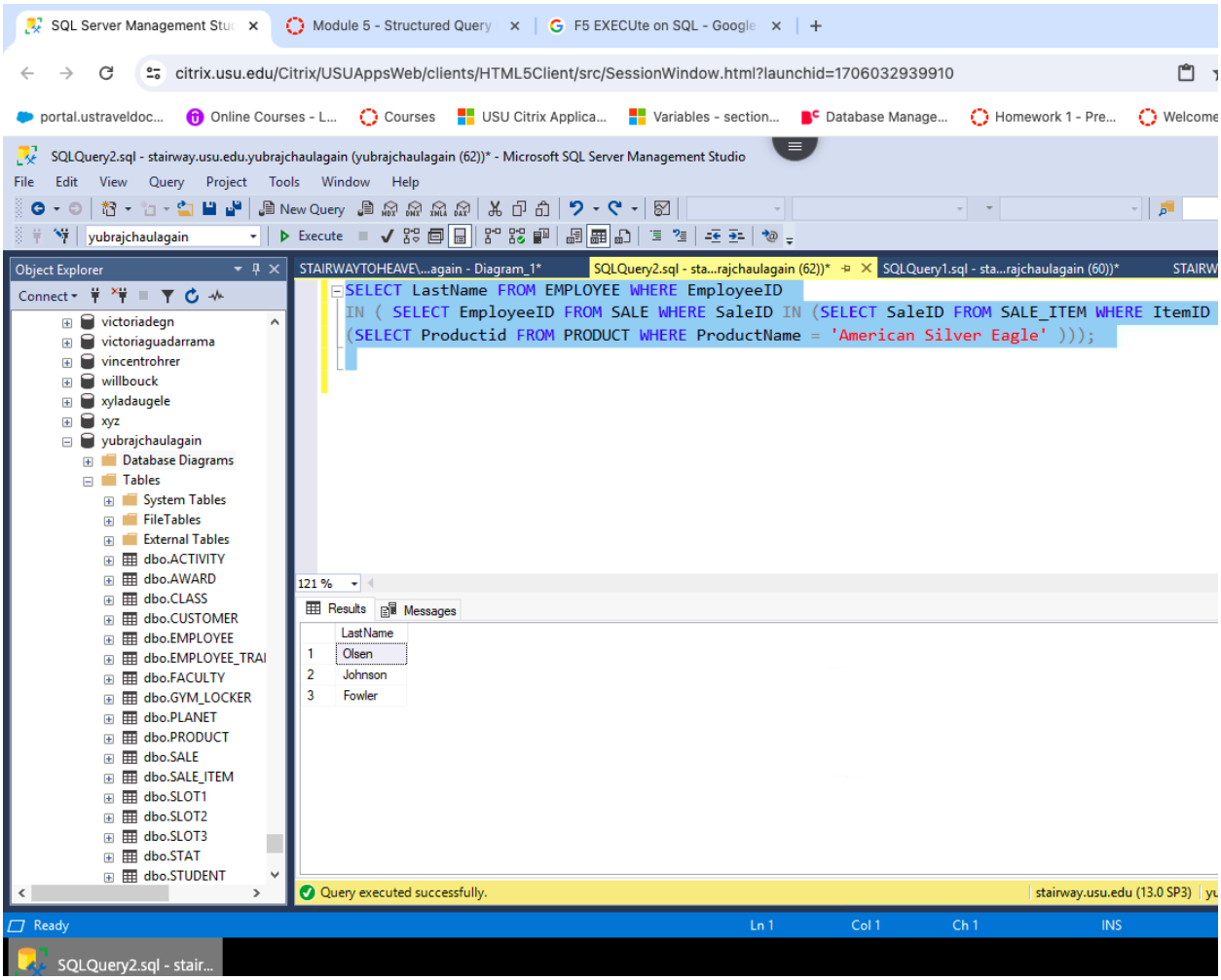
12. Write a Subquery that shows the first three letters of the employees' last name that earned a commission over 100. (Hint: (Quantity*Unitprice*.1)>=100).

SELECT LEFT(LastName, 3) AS first_three_letters FROM EMPLOYEEWHERE EmployeeID IN (SELECT EmployeeID FROM SALE_ITEM WHERE (Quantity * UnitPrice * 0.1) >= 100);



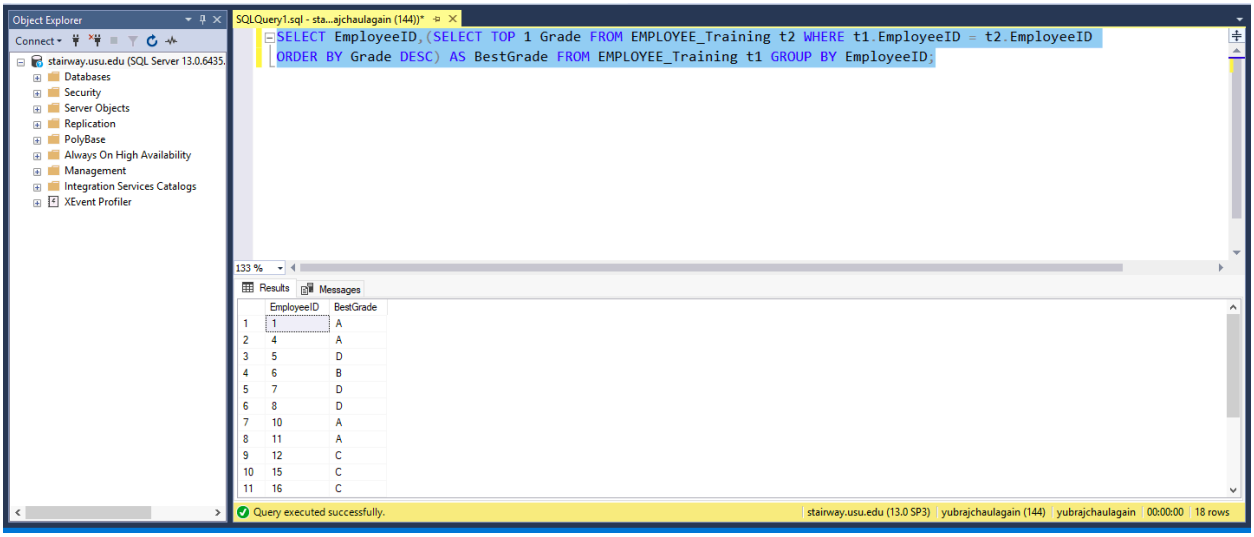
13. Write a Subquery that lists the Employees Last Name that have sold a product with the name “American Silver Eagle”. Question 7 above may provide some help with this question.

SELECT LastName FROM EMPLOYEE WHERE EmployeeID IN (SELECT EmployeeID FROM SALE WHERE SaleID IN (SELECT SaleID FROM SALE_ITEM WHERE ItemID IN (SELECT Productid FROM PRODUCT WHERE ProductName = 'American Silver Eagle')));



14. Write a **Correlated subquery** that shows the best grade earned by each student. Use the EMPLOYEE_Training table to --code this problem. Use DISTINCT if needed. Output should include the employeeID and highest grade. Also, would you use MIN(GRADE) or MAX(GRADE)? *Note, grades for this training only include A, B, C, D, and F.

SELECT EmployeeID,(SELECT TOP 1 Grade FROM EMPLOYEE_Training t2 WHERE t1.EmployeeID = t2.EmployeeID ORDER BY Grade DESC) AS BestGrade FROM EMPLOYEE_Training t1 GROUP BY EmployeeID;



Review the code and explain why it works. You might need to look up the ASCII function to better understand the solution.

The outer query is selecting the EmployeeID from the EMPLOYEE_Training table and creating a subquery.

The subquery (SELECT TOP 1 Grade FROM EMPLOYEE_Training t2 WHERE t1.EmployeeID = t2.EmployeeID ORDER BY ASCII(Grade) DESC) finds the top (highest) grade for each employee. It correlates with the outer query using t1.EmployeeID.

ORDER BY ASCII(Grade) DESC is used to order the grades based on their ASCII values in descending order. ASCII values are numeric representations of characters, so this ordering allows us to treat grades as numbers rather than characters.

ASCII(Grade) converts the character grade to its ASCII value. For example, the ASCII value of 'A' is lower than the ASCII value of 'B', so 'B' would be considered a higher grade.

The outer query groups the results by EmployeeID.

This code works by using the ASCII function to convert character grades into their corresponding ASCII values and then ordering them in descending order. This allows the query to find the highest grade for each employee, considering grades as numeric values.

15. Write a **correlated subquery** that shows the highest salary by state. Use the EMPLOYEE table to code the problem. * Your final WHERE clause in the correlated subquery DOESNT use

Employeeid at all in the problem… so don't write… (WHERE e1.EmployeeID = e2.EmployeeID).

```
SELECT   e1.State, e1.LastName,e1.FirstName, e1.Salary FROM EMPLOYEE e1 WHERE
   e1.Salary = (SELECT MAX(e2.Salary) FROM EMPLOYEE e2 WHERE
         e2.State = e1.State );
```