DATABASE MANAGEMENT SYSTEM ASSIGNMENT

- 28th May 2025
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- 1. Create the tables below in the database. Use foreign keys and primary keys as required.
 - a. Create a table called as student with the following columns student_id, first_name, last_name, birthdate, department_id ,address_id.
 - b. Create Address table with following columns address_id , street_address, city, State, postal_code
 - c. Create department table department_id, department name.
 Make sure you are using the right data type against all the columns.

Solution:

```
    ○ CREATE TABLE student (
    student_id SERIAL PRIMARY KEY,
    first_name VARCHAR(50),
    last_name VARCHAR(50),
    birthdate DATE,
    department_id INT REFERENCES department(department_id),
     address_id INT REFERENCES address(address_id)
 );
  14 • ⊖ CREATE TABLE address (
              address id SERIAL PRIMARY KEY,
  15
  16
              street_address VARCHAR(255),
  17
              city VARCHAR(100),
              state VARCHAR(50),
  18
               postal code VARCHAR(20)
      );
  20
  21
  22 ● 

○ CREATE TABLE department (
         department_id SERIAL PRIMARY KEY,
  23
             department_name VARCHAR(100) NOT NULL
  24
  25
  26
  27 • show tables;
                                 Export: Wrap
Result Grid Filter Rows:
    Tables_in_assignment
   address
    department
```

2. Use Sample data from <u>sampledata.txt</u> to insert data into the database.

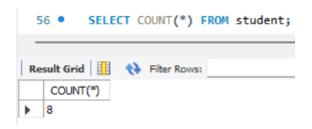
Answer:

```
28 •
            INSERT INTO department (department_id, department_name) VALUES
   29
            (1, 'Computer Science'),
            (2, 'Mechanical Engineering'),
            (3, 'Electrical Engineering'),
   31
          (4, 'Civil Engineering'),
   32
            (5, 'Mathematics'),
   33
   34
          (6, 'Biology');
  INSERT INTO address (address id, street address, city, state, postal code) VALUES
    (1, '123 Elm St', 'Springfield', 'IL', '62701'),
    (2, '456 Oak St', 'Decatur', 'IL', '62521'),
    (3, '789 Pine St', 'Champaign', 'IL', '61820'),
   (4, '102 Birch Rd', 'Peoria', 'IL', '61602'),
    (5, '205 Cedar Ave', 'Chicago', 'IL', '60601'),
    (6, '310 Maple Dr', 'Urbana', 'IL', '61801'),
    (7, '415 Oak Blvd', 'Champaign', 'IL', '61821'),
    (8, '520 Pine Rd', 'Carbondale', 'IL', '62901');

    INSERT INTO student (student_id, first_name, last_name, birthdate, department_id, address_id) VALUES

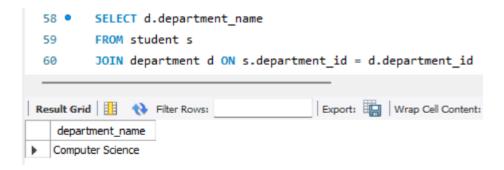
   (1, 'John', 'Doe', '1995-04-15', 1, 1),
   (2, 'Jane', 'Smith', '1996-07-22', 2, 2),
   (3, 'Alice', 'Johnson', '1994-11-30', 3, 3),
   (4, 'Michael', 'Brown', '1997-02-19', 4, 4),
   (5, 'Sophia', 'Davis', '1998-01-05', 5, 5),
   (6, 'Daniel', 'Wilson', '1995-06-10', 6, 6),
   (7, 'Olivia', 'Martinez', '1997-11-25', 1, 7),
   (8, 'Ethan', 'Miller', '1996-03-30', 2, 8);
```

3. Write a guery to find the total number of students.



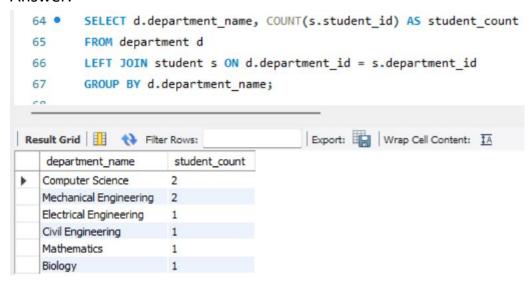
4. Write a query to find which department john belongs to.

Answer:



John belong to Computer Science department.

5. List All Departments with Their Number of Students (Including Departments with No Students)



6. Select all students with their department and address.

Answer:

```
71 •
        SELECT s.*, d.department_name, a.city, a.street_address
72
        FROM student s
        JOIN department d ON s.department id = d.department id
73
        JOIN address a ON s.address id = a.address id;
 74
75
                                         Export: Wrap Cell Content: IA
student_id first_name last_name birthdate
                                           department_id address_id department_name
                                                                                     city
                                                                                                street_address
            John
                      Doe
                                1995-04-15 1
                                                        1
                                                                  Computer Science
                                                                                     Springfield
                                                                                                123 Elm St
                     Smith
                                1996-07-22 2
            Jane
                                                        2
                                                                 Mechanical Engineering Decatur
                                                                                                456 Oak St
                      Johnson
                                1994-11-30
                                                                  Electrical Engineering
                                                                                     Champaign
                                                                                                789 Pine St
                      Brown 1997-02-19 4
                                                                 Civil Engineering
            Michael
                                                       4
                                                                                     Peoria
                                                                                                102 Birch Rd
            Sophia
                                1998-01-05 5
                                                                  Mathematics
                                                                                                205 Cedar Ave
                      Davis
                                                        5
                                                                                     Chicago
                     Wilson 1995-06-10 6
                                                                                                310 Maple Dr
                      Martinez
            Olivia
                                1997-11-25 1
                                                                  Computer Science
                                                                                     Champaign
                                                                                                415 Oak Blvd
                     Miller
                               1996-03-30 2
                                                        8
                                                                  Mechanical Engineering Carbondale 520 Pine Rd
```

7. Find all students who are in the 'Computer Science' department

Answer:

```
SELECT s.*
 76 •
        FROM student s
        JOIN department d ON s.department_id = d.department_id
        WHERE d.department name = 'Computer Science';
                                       Export: Wrap Cell Content: IA
department_id address_id
   student_id first_name last_name birthdate
            John
                               1995-04-15
                      Doe
  7
            Olivia
                     Martinez
                               1997-11-25 1
```

8. Update Jane's city name to New York.

```
UPDATE address
SET city = 'New York'

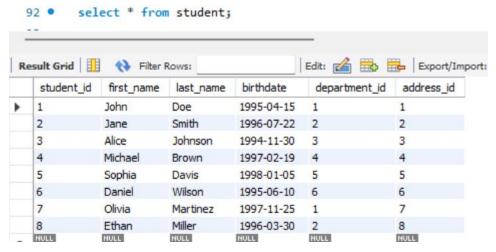
WHERE address_id = (
    SELECT address_id FROM student WHERE first_name = 'Jane'
);
```

```
SELECT s.first_name, s.last_name, a.city
 87 •
        FROM student s
 88
        JOIN address a ON s.address_id = a.address_id
 89
       WHERE s.first_name = 'Jane';
 90
 91
Export: Wra
  first_name
            last_name
                    city
 Jane
           Smith
                    New York
```

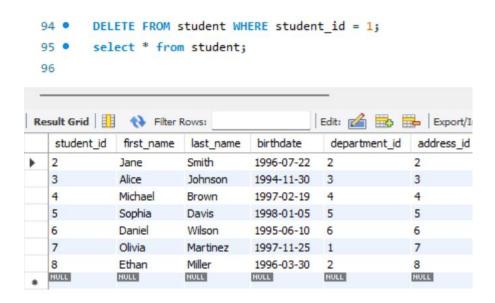
9. Delete a student from the student table.

Answer:

Before deleting:



After deleting:



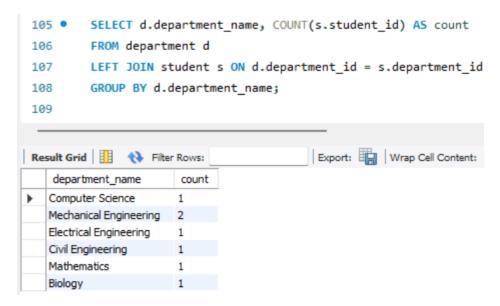
John with student_id = 1 is deleted.

10. Select all students with their department and address in New York.



11. Count how many students are in each department

Answer:



12. Find students who live in 'Springfield'

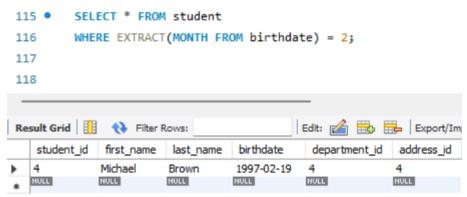
Answer:



There is no student from city = Springfield.

13. Select students whose birthday falls in February





14. Get the department and address details for a specific student, example john

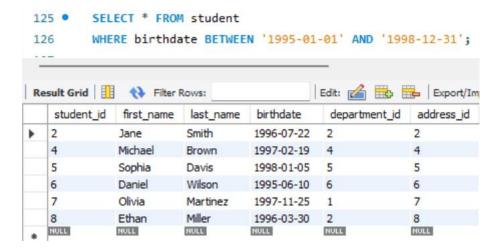
Answer:

Since John is deleted form database because of earlier query, took the example of Jane

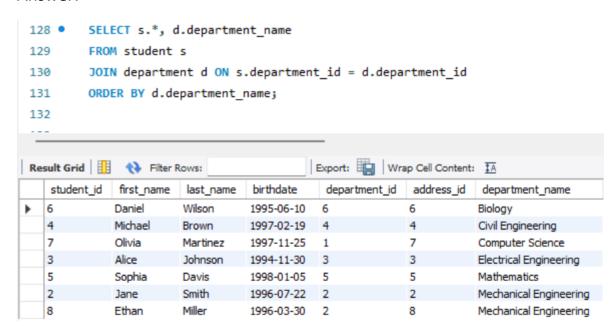


15. Find all students who are born within 1995 to 1998

Answer:

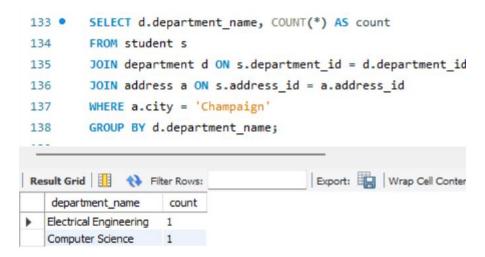


16. List all students and their corresponding department names, sorted by department



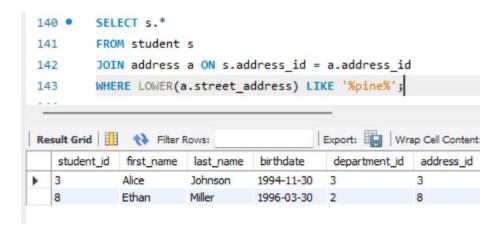
17. Find the number of students in each department who are living in 'Champaign'

Answer:



18. Retrieve the names of students who live on 'Pine' street

Answer:

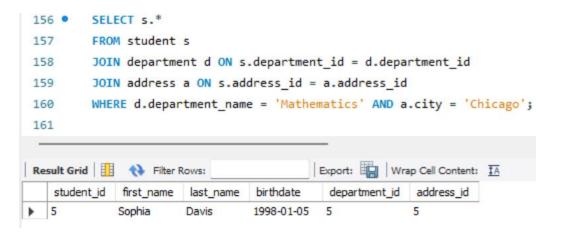


19. Update the department of a student with student_id = 6 to 'Mechanical Engineering'

Query to check:

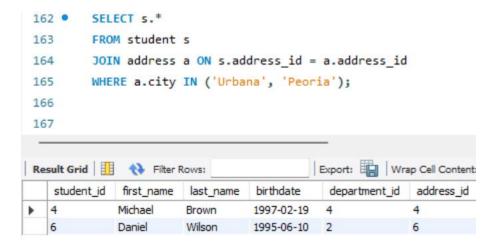
```
SELECT s.student_id, s.first_name, s.department_id, d.department_name
152
        FROM student s
153
        JOIN department d ON s.department_id = d.department_id
        WHERE s.student_id = 6;
154
155
156
157
Export: Wrap Cell Content: IA
   student_id first_name
                      department_id
                                  department_name
                                  Mechanical Engineering
            Daniel
```

20. Find the student(s) who live in the city 'Chicago' and are in the 'Mathematics' department



21. List all students who have an address in 'Urbana' or 'Peoria'

Answer:

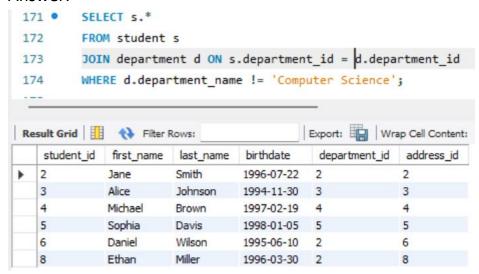


22. Find the student with the highest student_id

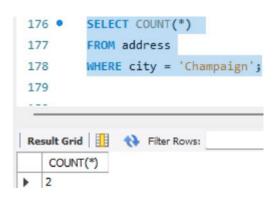


23. Find all students who are not in the 'Computer Science' department

Answer:

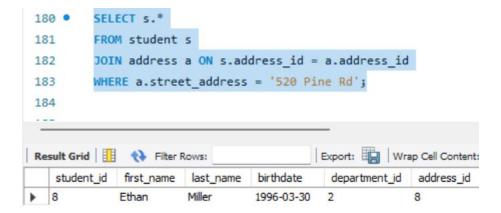


24. Count the total number of addresses in the 'Champaign' city

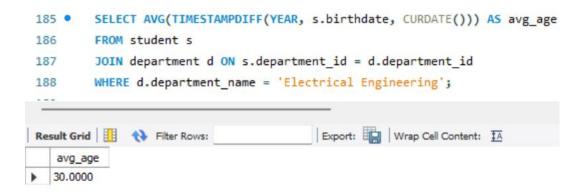


25. Find the name of the student who lives at '520 Pine Rd'

Answer:

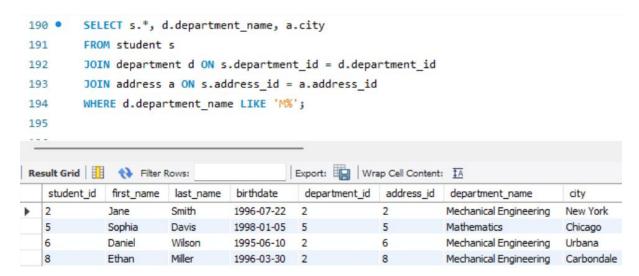


26. Get the average age of students in the 'Electrical Engineering' department



27. List the students, their department, and the city where they live, but only for those in departments starting with 'M'

Answer:



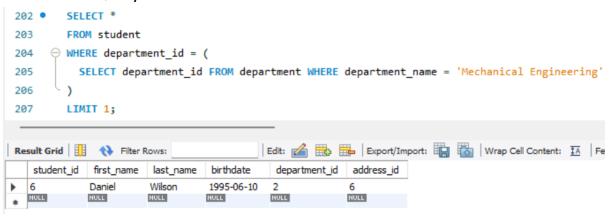
28. Delete a student from the 'Mechanical Engineering' department

Answer:

```
DELETE FROM student

O WHERE department_id = (
    SELECT department_id FROM department WHERE department_name = 'Mechanical Engineering'
)
LIMIT 1;
```

Verification Query:



Download order.sql

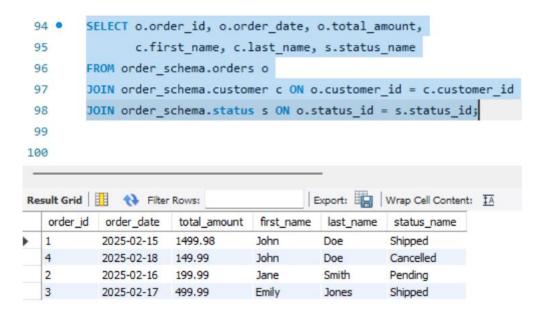
Open PG Admin and open query tool and select any database of your choice.

Click on "Open file" and select <u>order.sql</u> from your device and execute it.

Questions:

1. Retrieve All Orders with Their Customer Details and Current Status

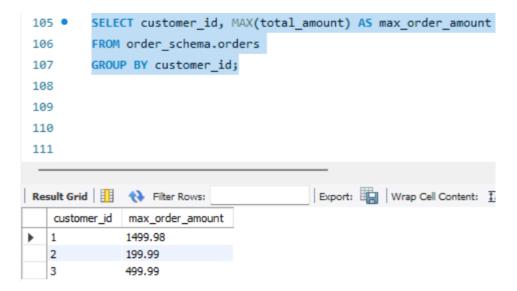
Answer:



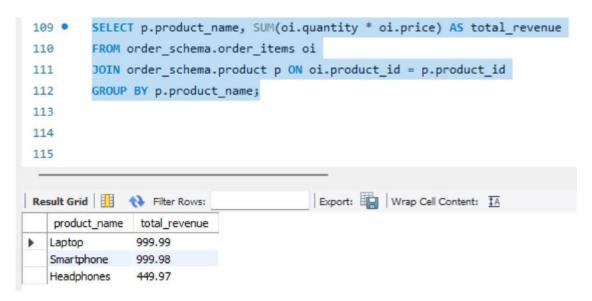
2. Get the Total Value of Orders for a Given Customer in a Specific Time Period

3. Find the Most Expensive Order by Customer

Answer:

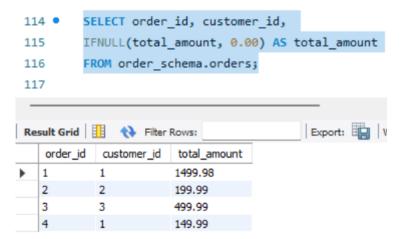


4. Find the Total Revenue for Each Product Based on Orders

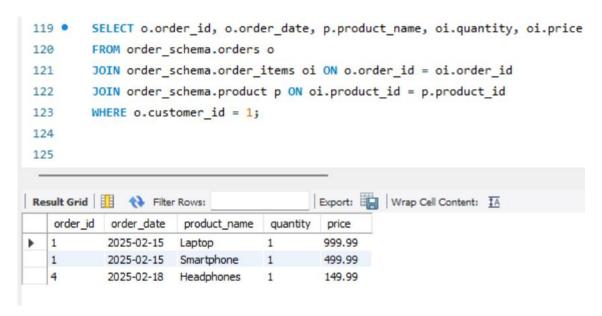


5. Write a query to retrieve the order ID, customer ID, and the total amount of each order. If the total amount is null, display '0.00' instead.

Answer:



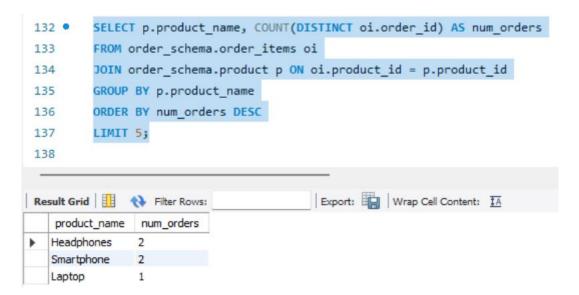
6. Retrieve the Order History of a Specific Customer Along with Product Details



7. Get the Average Order Value Per Customer in the Last 30 Days.

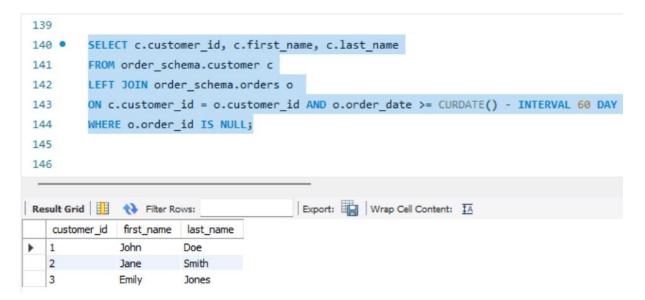
Answer:

8. Get the Top 5 Products with the Highest Number of Orders.

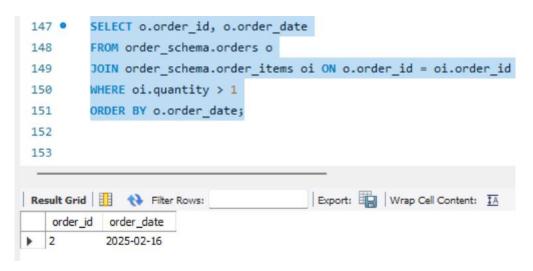


9. Get the Customers Who Have Not Placed Any Orders in the Last 60 Days

Answer:

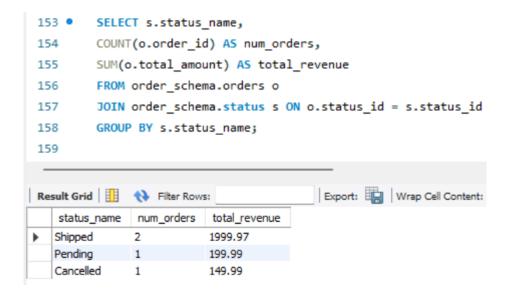


10.List the Orders with Products Ordered More Than Once, Sorted by Order Date

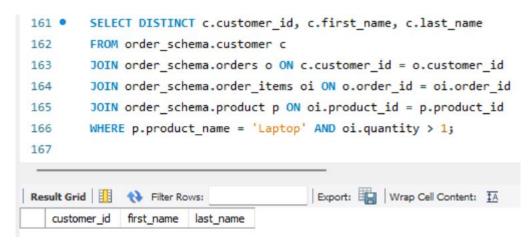


11. Retrieve the Number of Orders and Total Revenue for Each Status

Answer:



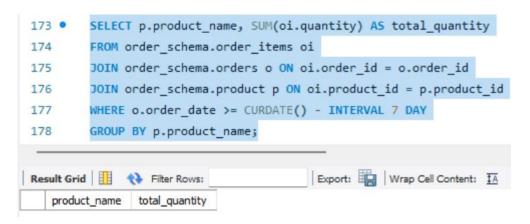
12.Find Customers Who Have Ordered More Than a Specific Product (e.g., "Laptop")



13. Find the Products That Have Never Been Ordered

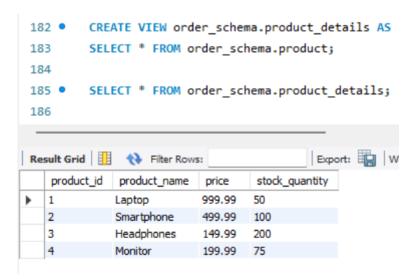
Answer:

14. Get the Total Quantity of Products Ordered in the Last 7 Days



15.Create a view named product_details that includes all columns from the product table.

Answer:



16.Create a view named order_summary that includes the order_id, customer_id, order_date, total_amount, and status_name (from the status table) for each order.

