SQL Assignment

**Creating TABLES**

CREATE TABLE BOATS (

REG\_NUM VARCHAR(7),

YEAR NUMERIC(4),

MAKE VARCHAR(10),

LENGTH NUMERIC(4,1),

BEAM NUMERIC(3),

CONSTRAINT BOATS\_PK PRIMARY KEY (REG\_NUM),

CONSTRAINT BOATS\_YR\_CC CHECK (YEAR > 1900),

CONSTRAINT BOATS\_LENGTH\_CC CHECK (LENGTH > 0),

CONSTRAINT BOATS\_BEAM\_CC CHECK (BEAM > 0)

);

INSERT INTO BOATS VALUES ('WN123AB',1977,'Hunter',25,96);

INSERT INTO BOATS VALUES ('WN234CD',1999,'Calabria',23,103);

INSERT INTO BOATS VALUES ('WN234EF',1962,'Del Mar',16,72);

INSERT INTO BOATS VALUES ('WN456GH',1957,'Harvey',13.5,70);

INSERT INTO BOATS VALUES ('WN567IJ',1997,'Seadoo',9,46);

INSERT INTO BOATS VALUES ('WN678JL',1996,'Bayliner',47,179);

CREATE TABLE ENGINE\_TYPES(

MAKE VARCHAR(12),

MODEL VARCHAR(12),

HP NUMERIC(4,1),

FUEL VARCHAR(6),

CONSTRAINT ENGINE\_TYPES\_PK PRIMARY KEY (MAKE, MODEL),

CONSTRAINT ENGINE\_TYPES\_HP\_CC CHECK (HP >= 0),

CONSTRAINT ENGINE\_TYPES\_FUEL\_CC CHECK (FUEL IN ('Gas', 'Petrol','Diesel'))

);

INSERT INTO ENGINE\_TYPES VALUES ('Clinton','K990',9.9,'Gas');

INSERT INTO ENGINE\_TYPES VALUES ('Mercruiser','350MagMPI',300,'Gas');

INSERT INTO ENGINE\_TYPES VALUES ('Mannem','Arjun',30,'Gas');

INSERT INTO ENGINE\_TYPES VALUES ('Tohatsu','M50CEPTS',50,'Gas');

INSERT INTO ENGINE\_TYPES VALUES ('Rotax','720CC',85,'Gas');

INSERT INTO ENGINE\_TYPES VALUES ('Hino','W06DTA',310,'Diesel');

CREATE TABLE ENGINES(

SERIAL\_NUM VARCHAR(7),

YEAR NUMERIC(4),

MAKE VARCHAR(12),

MODEL VARCHAR(12),

CONSTRAINT ENGINES\_PK PRIMARY KEY (SERIAL\_NUM),

CONSTRAINT ENGINES\_YR\_CC CHECK (YEAR > 1900),

CONSTRAINT ENGINES\_FK FOREIGN KEY (MAKE, MODEL) REFERENCES ENGINE\_TYPES (MAKE,MODEL) ON DELETE SET NULL

);

INSERT INTO ENGINES VALUES ('C1075',1975,'Clinton','K990');

INSERT INTO ENGINES VALUES ('M30099',1999,'Mercruiser','350MagMPI');

INSERT INTO ENGINES VALUES ('M3060',1962,'Mannem','Arjun');

INSERT INTO ENGINES VALUES ('T5090',1990,'Tohatsu','M50CEPTS');

INSERT INTO ENGINES VALUES ('R8596',1997,'Rotax','720CC');

INSERT INTO ENGINES VALUES ('H31096A',1996,'Hino','W06DTA');

INSERT INTO ENGINES VALUES ('H31096B',1996,'Hino','W06DTA');

CREATE TABLE BOAT\_ENGINES(

ENGINE\_SERIAL\_NUM VARCHAR(7),

BOAT\_ID VARCHAR(7),

CONSTRAINT BOAT\_ENGINES\_SERIALNUM\_FK FOREIGN KEY (ENGINE\_SERIAL\_NUM) REFERENCES ENGINES (SERIAL\_NUM) ON DELETE SET NULL,

CONSTRAINT BOAT\_ENGINES\_BOATID\_FK FOREIGN KEY (BOAT\_ID) REFERENCES BOATS (REG\_NUM) ON DELETE SET NULL

);

INSERT INTO BOAT\_ENGINES VALUES ('C1075','WN123AB');

INSERT INTO BOAT\_ENGINES VALUES ('M30099','WN234CD');

INSERT INTO BOAT\_ENGINES VALUES ('M3060','WN234EF');

INSERT INTO BOAT\_ENGINES VALUES ('T5090','WN456GH');

INSERT INTO BOAT\_ENGINES VALUES ('R8596','WN567IJ');

INSERT INTO BOAT\_ENGINES VALUES ('H31096A','WN678JL');

INSERT INTO BOAT\_ENGINES VALUES ('H31096B','WN678JL');

CREATE TABLE BOAT\_REGISTRY (

CUST\_ID SERIAL PRIMARY KEY,

L\_NAME VARCHAR(255),

F\_NAME VARCHAR(255),

ADDRESS VARCHAR(255),

ZIP VARCHAR(10),

EMAIL VARCHAR(255),

BALANCE NUMERIC CHECK (BALANCE >= 0),

BOAT\_ID VARCHAR(10) REFERENCES BOATS (REG\_NUM) ON DELETE SET NULL

);

INSERT INTO BOAT\_REGISTRY (L\_NAME, F\_NAME, ADDRESS, ZIP, EMAIL, BALANCE, BOAT\_ID)

VALUES ('Bach', 'David', '2039 76th St.', '10001', 'david@davidbach.com', 1250.00, 'WN123AB');

INSERT INTO BOAT\_REGISTRY (L\_NAME, F\_NAME, ADDRESS, ZIP, EMAIL, BALANCE, BOAT\_ID)

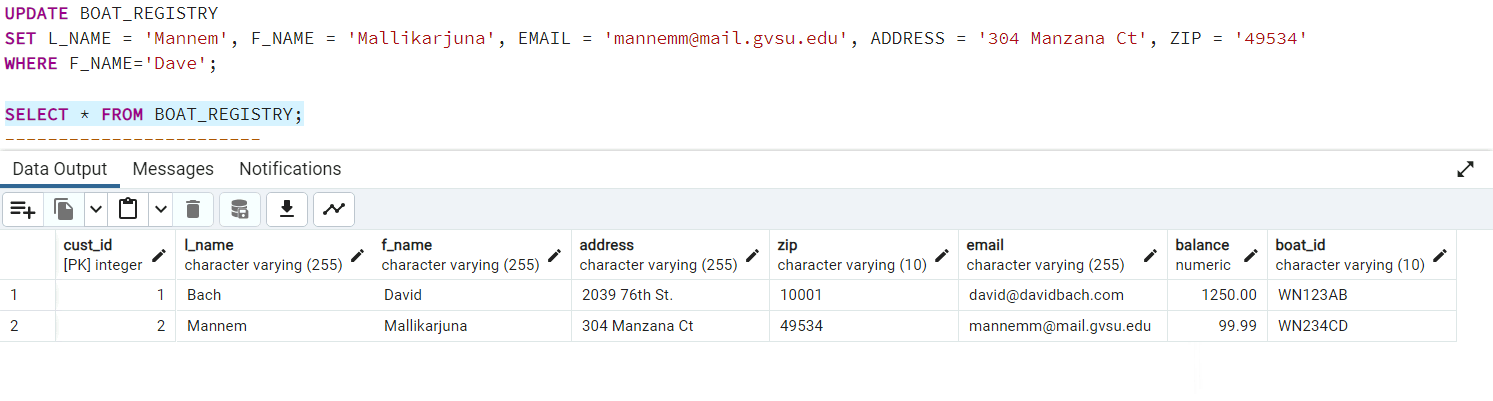
VALUES ('Ramsey', 'Dave', '8391 Main St.', '37212', 'dave@daveramsey.com', 99.99, 'WN234CD');

**UPDATE BOAT\_REGISTRY**

SET L\_NAME = 'Mannem', F\_NAME = 'Mallikarjuna', EMAIL = 'mannemm@mail.gvsu.edu', ADDRESS = '304 Manzana Ct', ZIP = '49534'

WHERE F\_NAME='Dave';

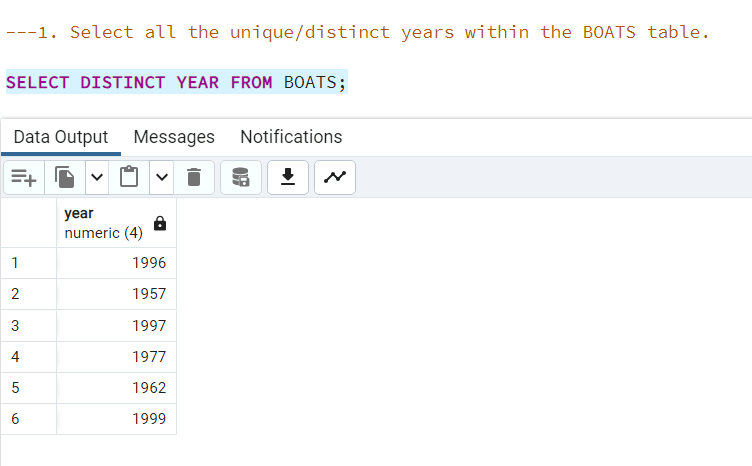
SELECT \* FROM BOAT\_REGISTRY;



-------------------------------------------------------------------------------------------------------------------------------

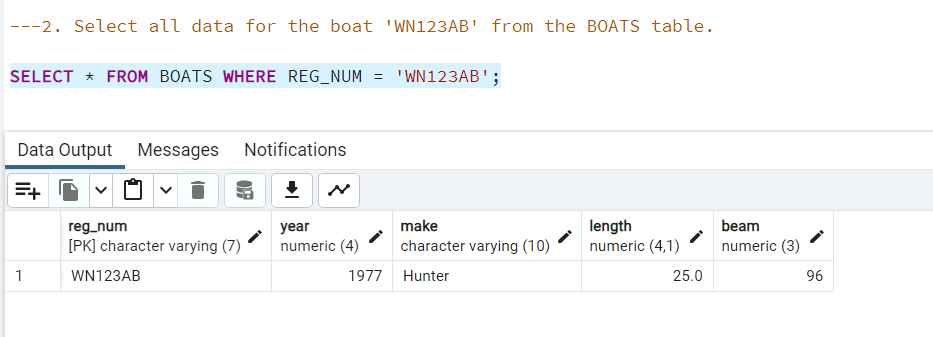
---1. ***Select all the unique/distinct years within the BOATS table.***

SELECT DISTINCT YEAR FROM BOATS;



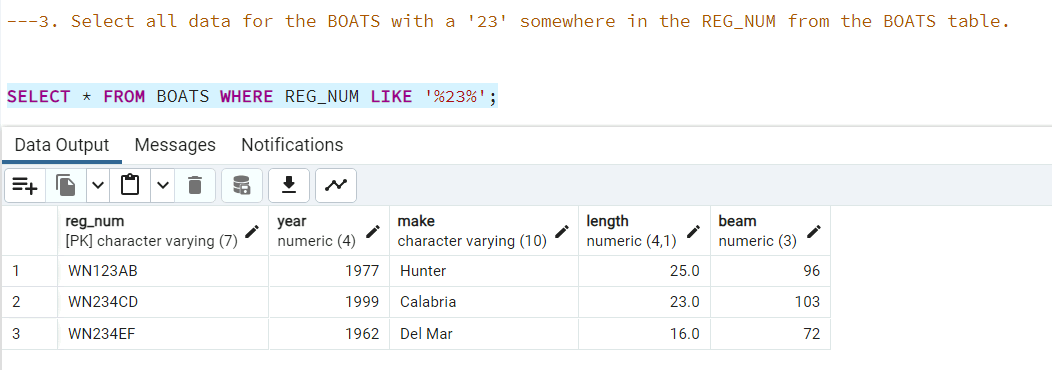
---2. ***Select all data for the boat 'WN123AB' from the BOATS table.***

SELECT \* FROM BOATS WHERE REG\_NUM = 'WN123AB';



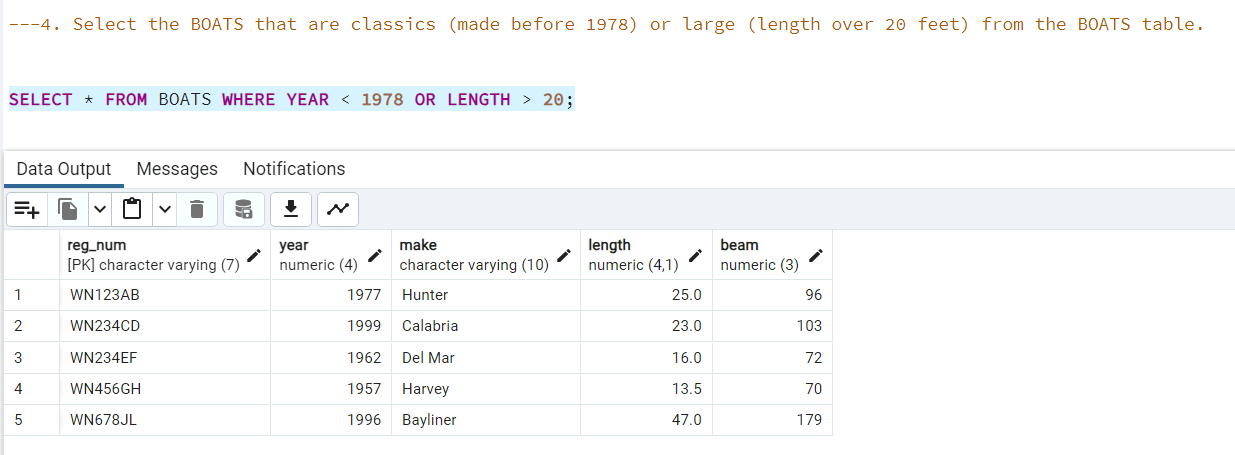
---3. ***Select all data for the BOATS with a '23' somewhere in the REG\_NUM from the BOATS table.***

SELECT \* FROM BOATS WHERE REG\_NUM LIKE '%23%';



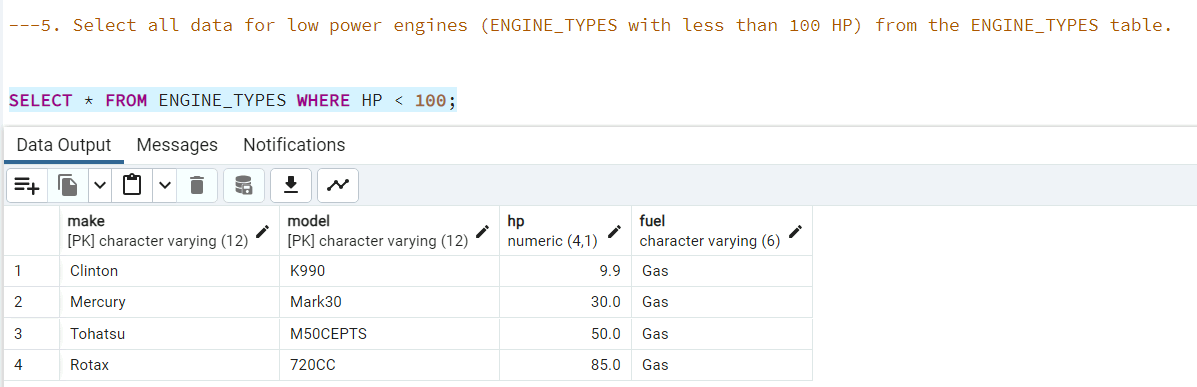
---4. ***Select the BOATS that are classics (made before 1978) or large (length over 20 feet) from the BOATS table.***

SELECT \* FROM BOATS WHERE YEAR < 1978 OR LENGTH > 20;



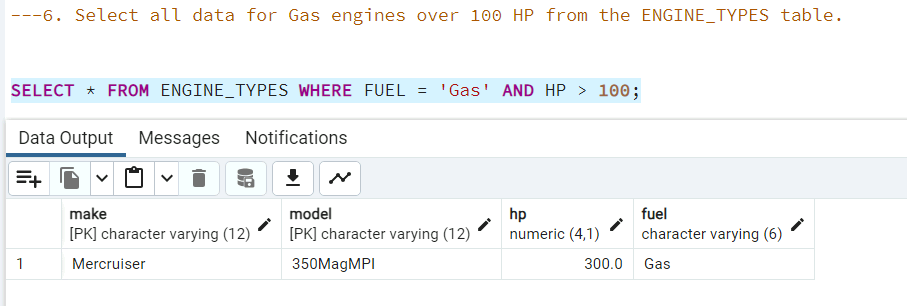
---5. ***Select all data for low power engines (ENGINE\_TYPES with less than 100 HP) from the ENGINE\_TYPES table.***

SELECT \* FROM ENGINE\_TYPES WHERE HP < 100;



---6. ***Select all data for Gas engines over 100 HP from the ENGINE\_TYPES table.***

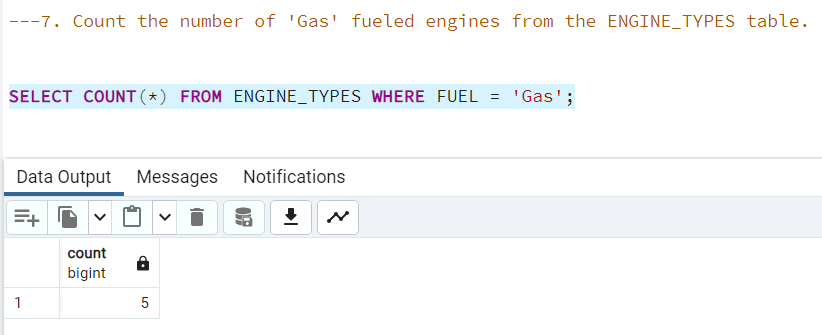
SELECT \* FROM ENGINE\_TYPES WHERE FUEL = 'Gas' AND HP > 100;



---Aggregate Queries:

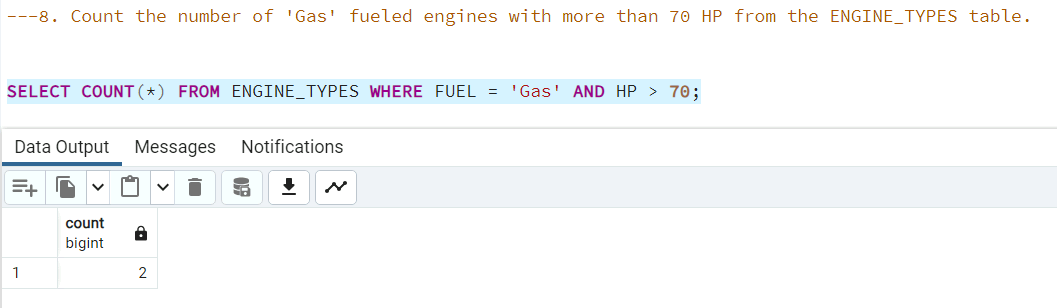
---7. ***Count the number of 'Gas' fueled engines from the ENGINE\_TYPES table.***

SELECT COUNT(\*) FROM ENGINE\_TYPES WHERE FUEL = 'Gas';



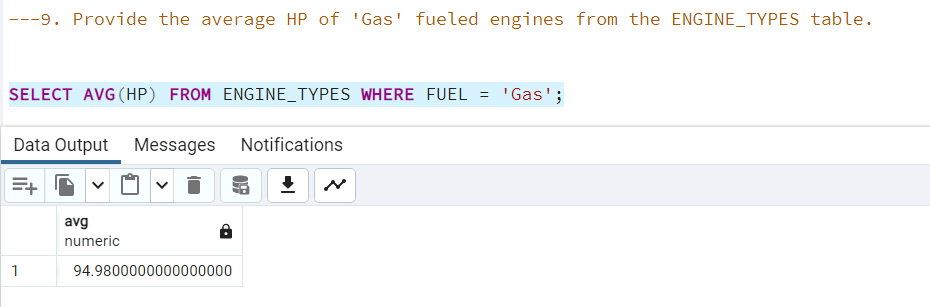
---8. ***Count the number of 'Gas' fueled engines with more than 70 HP from the ENGINE\_TYPES table.***

SELECT COUNT(\*) FROM ENGINE\_TYPES WHERE FUEL = 'Gas' AND HP > 70;



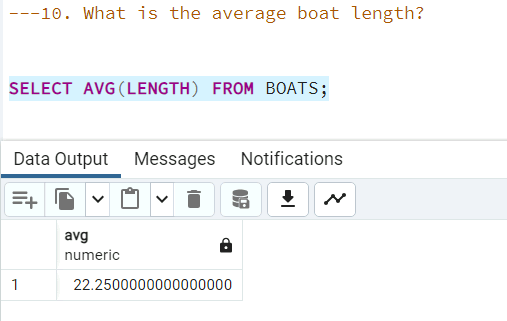
---9. ***Provide the average HP of 'Gas' fueled engines from the ENGINE\_TYPES table.***

SELECT AVG(HP) FROM ENGINE\_TYPES WHERE FUEL = 'Gas';



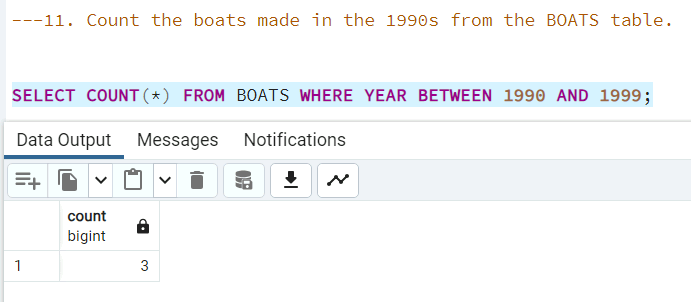
---10. ***What is the average boat length?***

SELECT AVG(LENGTH) FROM BOATS;



---11. ***Count the boats made in the 1990s from the BOATS table.***

SELECT COUNT(\*) FROM BOATS WHERE YEAR BETWEEN 1990 AND 1999;

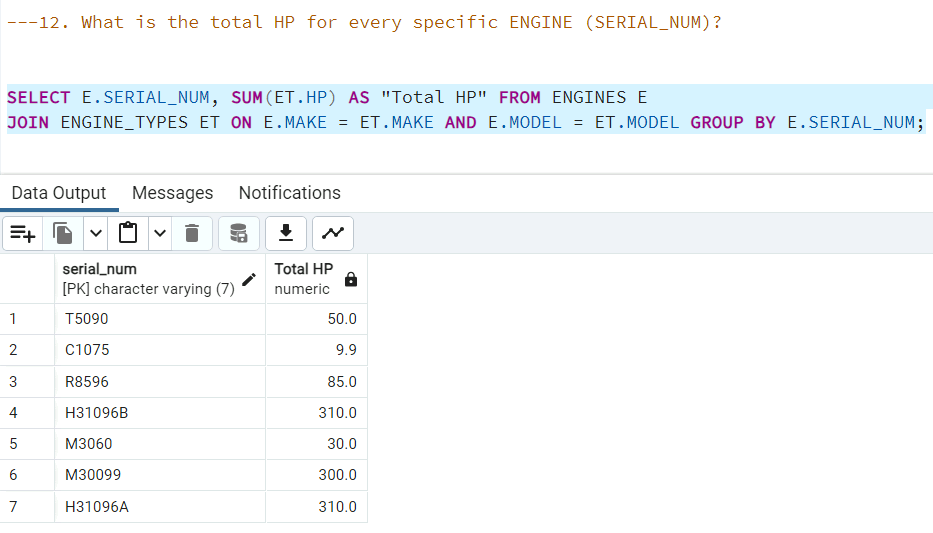


---Multi-table Joins:

---12. ***What is the total HP for every specific ENGINE (SERIAL\_NUM)?***

SELECT E.SERIAL\_NUM, SUM(ET.HP) AS "Total HP" FROM ENGINES E

INNER JOIN ENGINE\_TYPES ET ON E.MAKE = ET.MAKE AND E.MODEL = ET.MODEL GROUP BY E.SERIAL\_NUM;

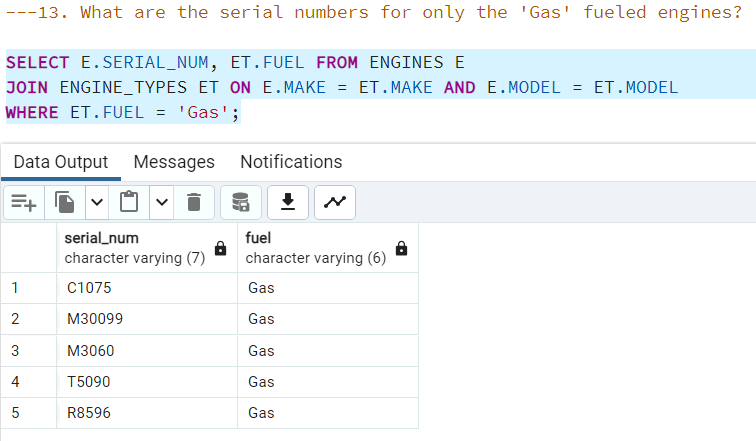


---13. ***What are the serial numbers for only the 'Gas' fueled engines?***

SELECT E.SERIAL\_NUM, ET.FUEL FROM ENGINES E

INNER JOIN ENGINE\_TYPES ET ON E.MAKE = ET.MAKE AND E.MODEL = ET.MODEL

WHERE ET.FUEL = 'Gas';



---14. ***Which BOATS have over 100 total HP?***

SELECT B.REG\_NUM, SUM(ET.HP) AS "Total HP" FROM BOATS B

JOIN BOAT\_ENGINES BE ON B.REG\_NUM = BE.BOAT\_ID

JOIN ENGINES E ON BE.ENGINE\_SERIAL\_NUM = E.SERIAL\_NUM

JOIN ENGINE\_TYPES ET ON E.MAKE = ET.MAKE AND E.MODEL = ET.MODEL

GROUP BY B.REG\_NUM HAVING SUM(ET.HP) > 100;

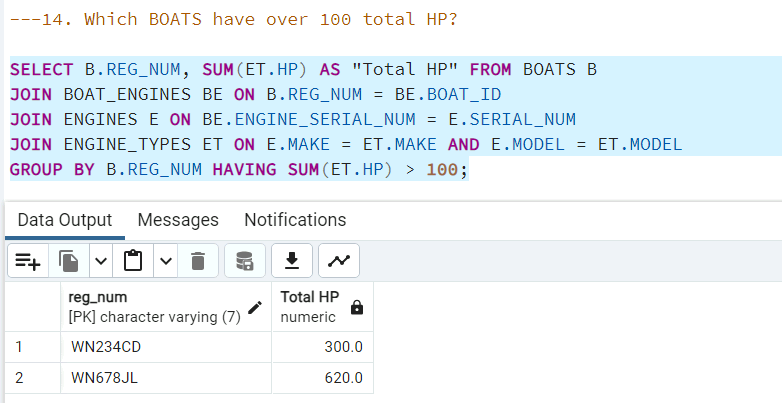
*---OR MORE EFFICIENTLY*

SELECT BE.BOAT\_ID, SUM(ET.HP) AS "Total HP" FROM BOAT\_ENGINES BE

JOIN ENGINES E ON BE.ENGINE\_SERIAL\_NUM = E.SERIAL\_NUM

JOIN ENGINE\_TYPES ET ON E.MAKE = ET.MAKE AND E.MODEL = ET.MODEL

GROUP BY BE.BOAT\_ID HAVING SUM(ET.HP) > 100;



---Sub-Queries:

---***15. Which newer full-sized BOATS (LENGTH > 20 and YEAR > 1990) also have an ENGINE with over 300 HP?***

SELECT REG\_NUM FROM BOATS WHERE LENGTH > 20 AND YEAR > 1990

AND REG\_NUM IN (

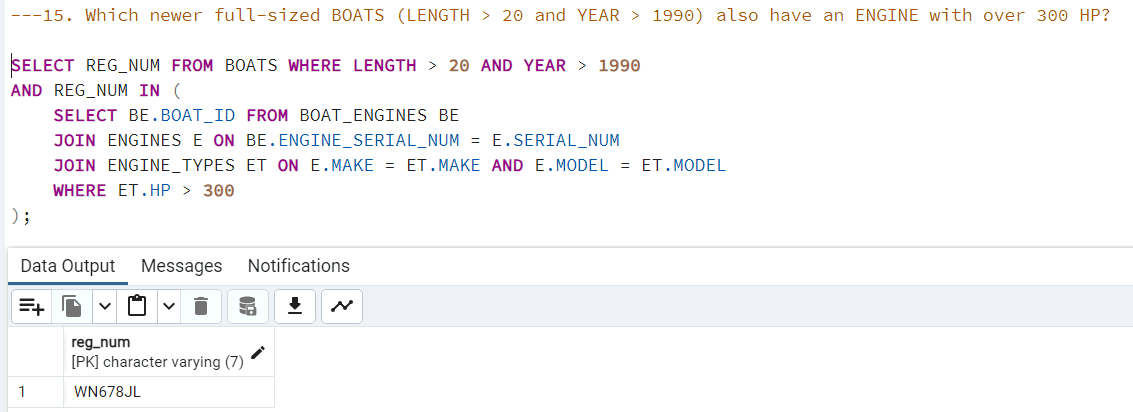
SELECT BE.BOAT\_ID FROM BOAT\_ENGINES BE

JOIN ENGINES E ON BE.ENGINE\_SERIAL\_NUM = E.SERIAL\_NUM

JOIN ENGINE\_TYPES ET ON E.MAKE = ET.MAKE AND E.MODEL = ET.MODEL

WHERE ET.HP > 300

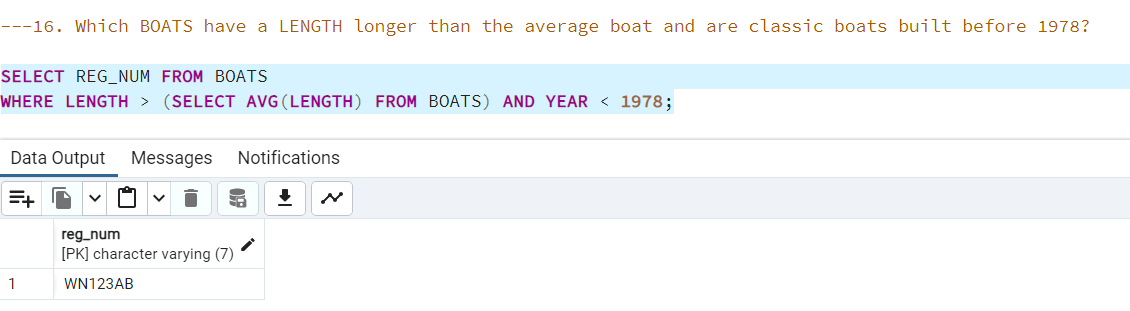
);



---***16. Which BOATS have a LENGTH longer than the average boat and are classic boats built before 1978?***

SELECT REG\_NUM FROM BOATS

WHERE LENGTH > (SELECT AVG(LENGTH) FROM BOATS) AND YEAR < 1978;

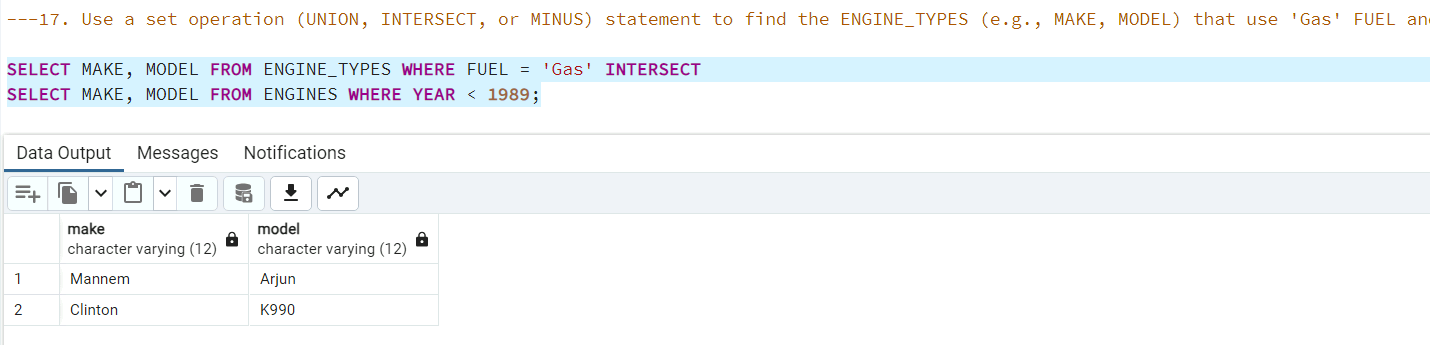


---Set Operations:

---***17. Use a set operation (UNION, INTERSECT, or MINUS) statement to find the ENGINE\_TYPES (e.g., MAKE, MODEL) that use 'Gas' FUEL and were produced before 1989.***

SELECT MAKE, MODEL FROM ENGINE\_TYPES WHERE FUEL = 'Gas' INTERSECT

SELECT MAKE, MODEL FROM ENGINE\_TYPES WHERE YEAR < 1989;

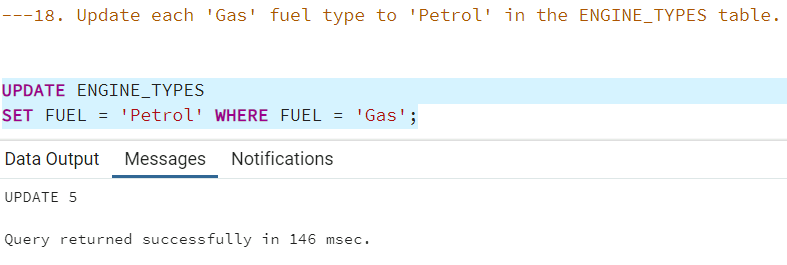


---Additional DML Statements:

---***18. Update each 'Gas' fuel type to 'Petrol' in the ENGINE\_TYPES table.***

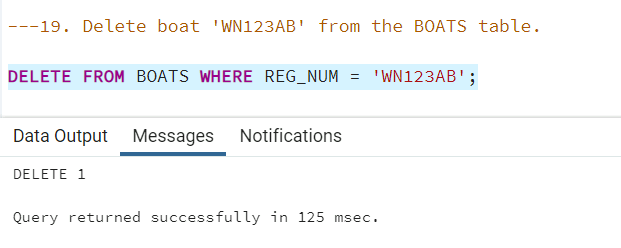
UPDATE ENGINE\_TYPES

SET FUEL = 'Petrol' WHERE FUEL = 'Gas';



---***19. Delete boat 'WN123AB' from the BOATS table.***

DELETE FROM BOATS WHERE REG\_NUM = 'WN123AB';



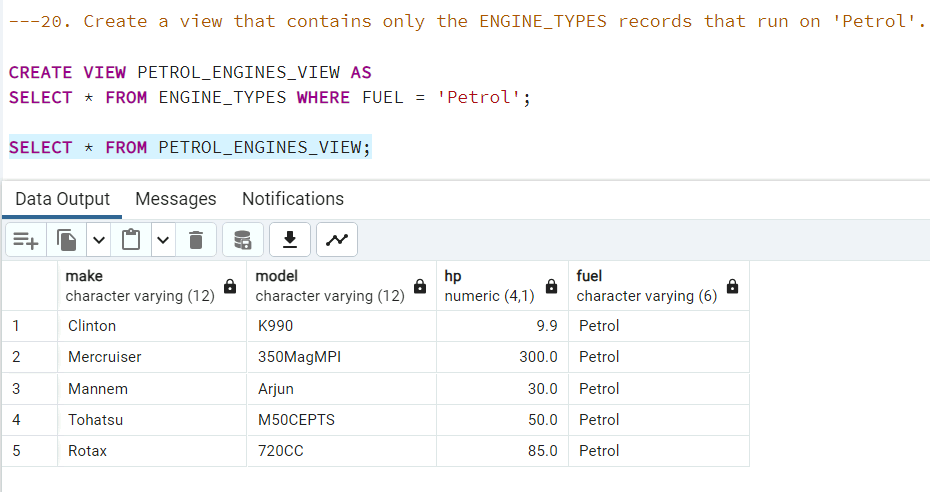
---DDL - View Statements:

---***20. Create a view that contains only the ENGINE\_TYPES records that run on 'Petrol'.***

CREATE VIEW PETROL\_ENGINES\_VIEW AS

SELECT \* FROM ENGINE\_TYPES WHERE FUEL = 'Petrol';

SELECT \* FROM PETROL\_ENGINES\_VIEW;



---***21. Create a view that lists all pertinent information about your boat, including your name, the boat's name, the engine type, and engine horsepower.***

CREATE VIEW MY\_BOAT\_VIEW AS

SELECT BR.L\_NAME, BR.F\_NAME, B.MAKE AS BOAT\_MAKE, B.LENGTH AS BOAT\_LENGTH, E.MODEL AS ENGINE\_MODEL, ET.HP AS ENGINE\_HP

FROM BOAT\_REGISTRY BR

JOIN BOATS B ON BR.BOAT\_ID = B.REG\_NUM

JOIN ENGINES E ON B.REG\_NUM = E.SERIAL\_NUM

JOIN ENGINE\_TYPES ET ON E.MAKE = ET.MAKE AND E.MODEL = ET.MODEL;

