Experiment No.: 04

Title: To use DML operations and SQL queries to Populate the database

Batch:A3 **Roll No.:** 16010423099 **Experiment No: 04**

Aim: To use DML operations and SQL queries to populate the database .

Resources needed: PostgreSQL PgAdmin4

Theory:

The Data Manipulation Language (DML) is used to populate the table with values, modify the table values and remove the rows of the table.

The DML statements
are: SELECT

INSERT
UPDATE
DELETE

Procedure:

```
CREATE TABLE products (
product_no integer,

name text,
price
numeric );
```

Let us consider the above products table

Inserting rows:
The INSERT command requires the table name and column values

```
INSERT INTO products VALUES (1, 'Cheese', 9.99);
```

If we don't have values for all the columns, you can omit some of them. In that case, the columns will be filled with their default values. For example:

```
INSERT INTO products (product_no, name) VALUES (1, 'Cheese')
```

Updating the values:
The UPDATE command requires three pieces of information:

1. The name of the table and column to update
2. The new value of the column
3. Which row(s) to update

UPDATE products SET price = 10 WHERE price = 5;
UPDATE products SET price = price * 1.10;

Deleting rows:

The syntax of the DELETE command is similar to the UPDATE command.
DELETE FROM products WHERE price = 10;

Retrieving values:

The general syntax of the SELECT command
is SELECT select_list FROM table_expression
SELECT * FROM table1;
SELECT * FROM products WHERE price=10;
SELECT product_no, name FROM products WHERE price=10;

Example:

```
insert into department values('IT', 101, 'mumbai');
insert into department values('COMP', 102, 'mumbai');
insert into department values('ETRX', 103, 'delhi');
insert into department values('EXTC', 104, 'chennai');
insert into department values('account', 105, 'mumbai');

insert into employee values('anita','m','sharma','emp0001',20000,'mumbai',101);
insert into employee values('nita','g','patil','emp0004',10000,'mumbai',101);
insert into employee values('krupita','v','jetali','emp0003',20000,'delhi',103);
insert into employee values('juhi','r','verma','emp0002',15000,'delhi',104);
insert into employee  values('anita','m','sharma', 'emp0005',20000,'mumbai',104);

insert into project values( 1, 'mumbai','website',101);
insert into project values( 2, 'chennai','coding',101);
insert into project values( 3, 'mumbai','testing',102);
insert into project values( 4, 'delhi','documentaion',103);

insert into works_on values(1,'emp0001', 12);
insert into works_on values(1,'emp0002', 10);
insert into works_on values(2,'emp0001', 6);
insert into works_on values(3,'emp0004', 2);

insert into dependent values(‘emp0001’, ‘sunita’,’sister’);
insert into dependent values(‘emp0001’, ‘nita’,’mother’);
insert into dependent values(‘emp0002’, ‘kamal’,’brother’);
insert into dependent values('emp0004', 'krishna','father');


select * from employee;
select * from department;
select * from project;
select * from dependent;
select * from works_on;
```

1) employee

```
fnamemnamelnamessn        salary     ecitydno
-------------------------------------- ----------------------------- ---------------------------------
anita          m        sharma       emp0001    20000      mumbai101
juhi            r         verma        emp0002    15000      delhi            104
krupita        v         jetali         emp0003     20000      delhi            103
nita            g         patil           emp0004     10000      mumbai       101
anita          m        sharma      emp0005      20000     mumbai104
```

2) department

```
dnamednodlocation
----------------------------- ----------- ----------------------------------
IT                            101       mumbai
COMP                        102       mumbai
ETRX                        103       delhi
EXTC                        104       chennai
account                    105       mumbai
```

4) project

```
pnoplocationpnamedno
----------- -------------------------------------- -------------------- -----------
1         mumbai                             website           101
2         chennai                          coding           101
3         mumbai                             testing           102
4         delhidocumentaion        103
```

5) dependents

```
ssndepname                    relation
------------------- ----------------------------- -----------------------------
emp0001nita                     mother
emp0001sunita                    sister
emp0002kamal                     brother
emp0004krishna                   father
```

6) woks_on

```
pnossnno_of_hrs
----------- -------------------- -----------
1          emp0001            12
1          emp0002            10
2          emp0001            6
3          emp0004            2
```

Results: (Queries printout with output as per the format)

1. Write 10 queries using 'from' and 'where' clause.

Example:

1) **To extract the name and ssn of all the employees:**
Select fname, mname, lname, ssn from employee;

```
fnamemnamelnamessn
-------------------------------------- -------------------------------------- ----------------------------
anitasharmam                          emp0001
juhiverma                            r                      emp0002
krupitajetali                          v                      emp0003
nitapatil                          g                      emp0004
anitasharma                            m                      emp0005
```

2) **To select names and city of the employees earning salary more then 10000:**
Select fname, mname, lname, ecity from the employee where salary>10000;

```
fnamemnamelname              ecity
-------------------------------------- ------------------------ --------------------------------------
anitasharmam                   mumbai
juhivermar                   delhi
krupitajetaliv                   delhi
anitasharma m                  mumbai
```

3) **TO get the details of the cities of the employees in our company:**
select distinct ecity from employee;

```
ecity
------------
delhi
mumbai
```

4) **To find the name of the department located in Mumbai and with department number 101:**

```
select dname from department where dlocation='Mumbai' and dno=101;
dname
--------------
```

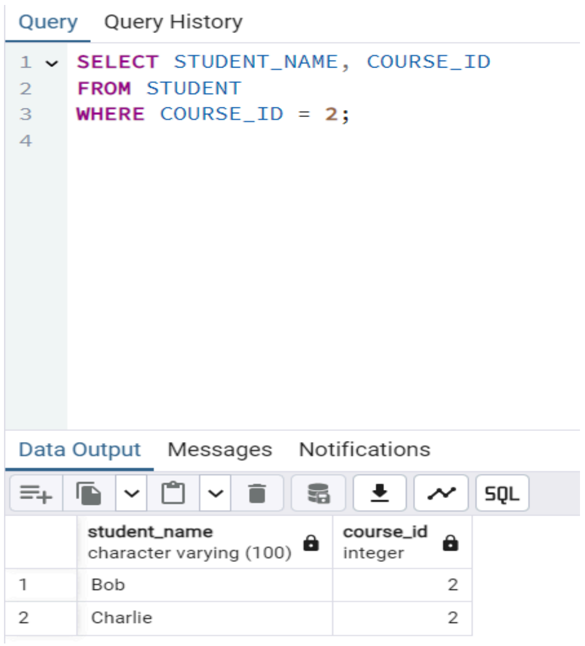
5) **To delete all dependent whose relation is mother with employee:**

```
delete form dependent where relation='mother';
ssndepname                relation
-------------------- ------------------------------ ------------------------------
emp0001sunita                sister
emp0002kamal                  brother
emp0004krishna                father
```

6) **Update relation employee to increment salary of all employees working in Department 101 by Rs. 10000:**

```
update  employee set salary=salary+10000 where dno=101;
fnamemnamelnamessn         salary     ecitydno
---------------------------------------- ------------------------------ ----------------------------------
anita          m       sharma      emp0001     30000      mumbai101
juhi            r       verma        emp0002     15000      delhi              104
krupita        v       jetali        emp0003     20000      delhi              103
nita            g       patil emp0004      20000      mumbai        101
anita          m       sharma      emp0005      20000     mumbai104
```

Results:

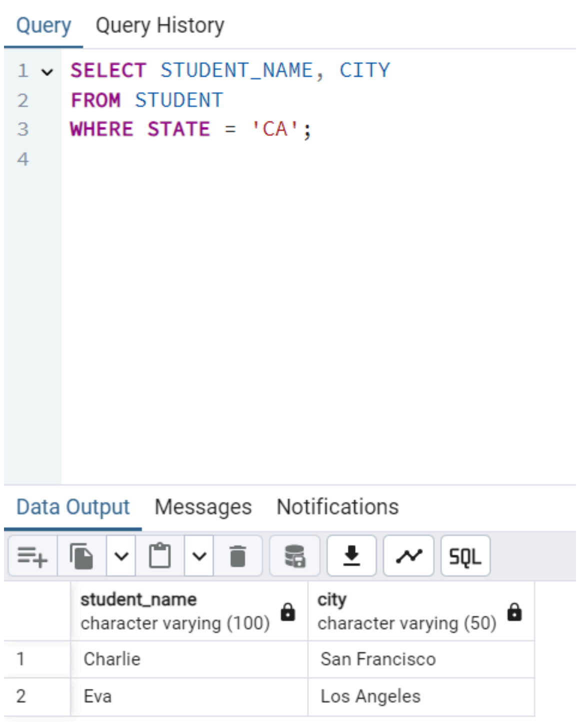


Query   Query History

```
SELECT STUDENT_NAME, COURSE_ID
FROM STUDENT
WHERE COURSE_ID = 2;
```

Data Output   Messages   Notifications

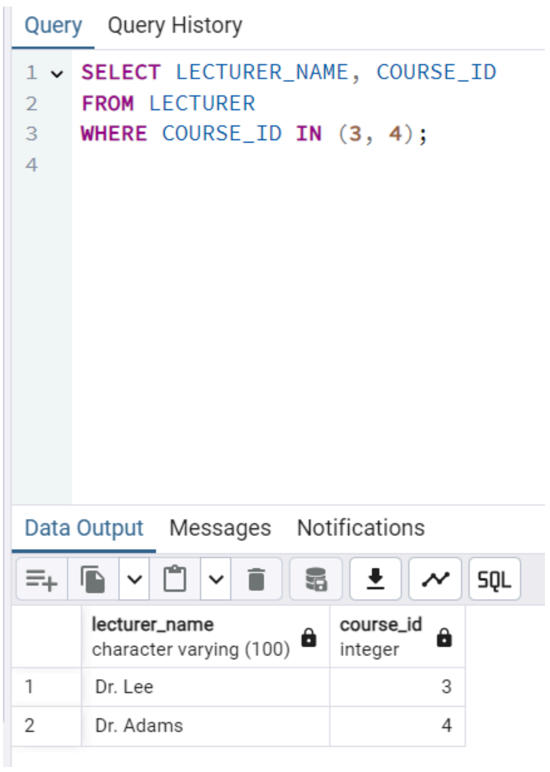
	student_name character varying (100)	course_id integer
1	Bob	2
2	Charlie	2


Query Query History

```sql
SELECT STUDENT_NAME, CITY
FROM STUDENT
WHERE STATE = 'CA';
```

Data Output Messages Notifications

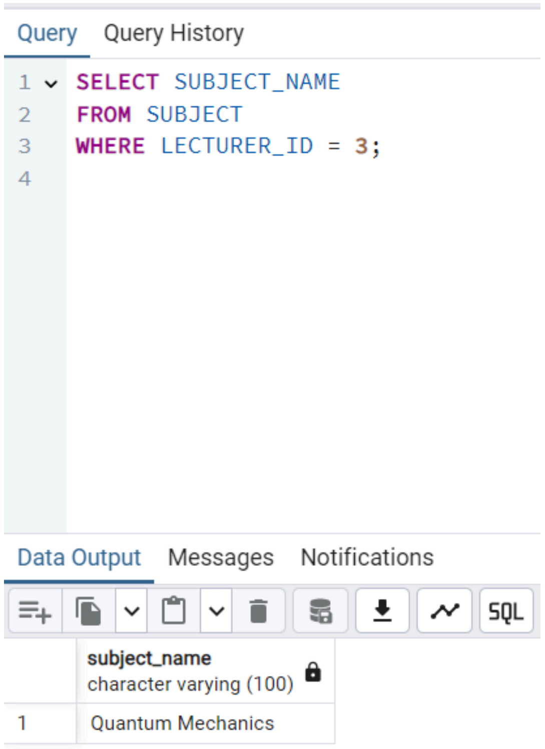
	student_name character varying (100)	city character varying (50)
1	Charlie	San Francisco
2	Eva	Los Angeles


Query Query History

```sql
SELECT LECTURER_NAME, COURSE_ID
FROM LECTURER
WHERE COURSE_ID IN (3, 4);
```

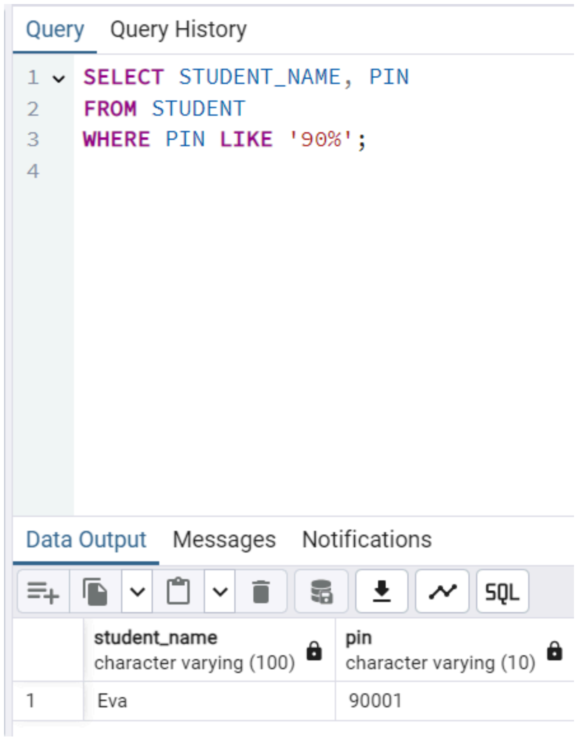
Data Output Messages Notifications

	lecturer_name character varying (100)	course_id integer
1	Dr. Lee	3
2	Dr. Adams	4



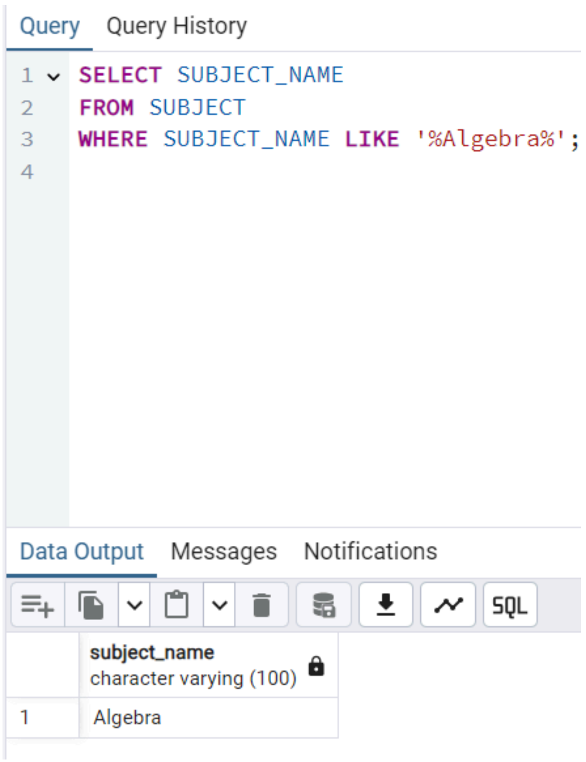
```sql
SELECT SUBJECT_NAME
FROM SUBJECT
WHERE LECTURER_ID = 3;
```

	subject_name character varying (100)
1	Quantum Mechanics



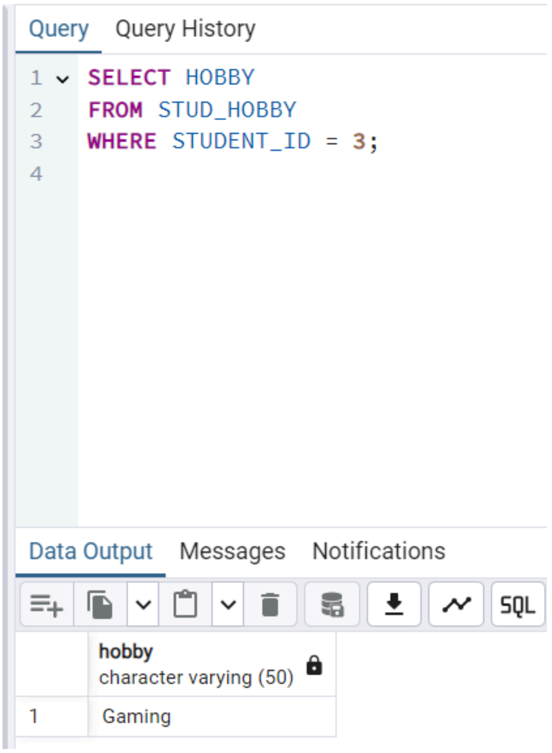
```sql
SELECT STUDENT_NAME, PIN
FROM STUDENT
WHERE PIN LIKE '90%';
```

	student_name character varying (100)	pin character varying (10)
1	Eva	90001



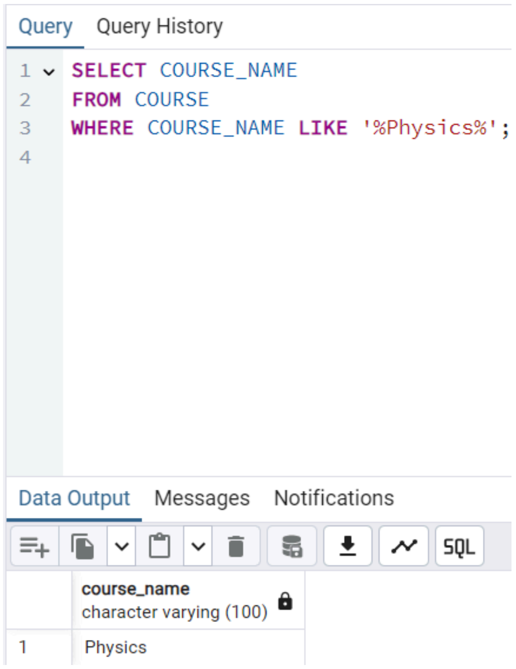
```sql
SELECT SUBJECT_NAME
FROM SUBJECT
WHERE SUBJECT_NAME LIKE '%Algebra%';
```

	subject_name character varying (100)
1	Algebra



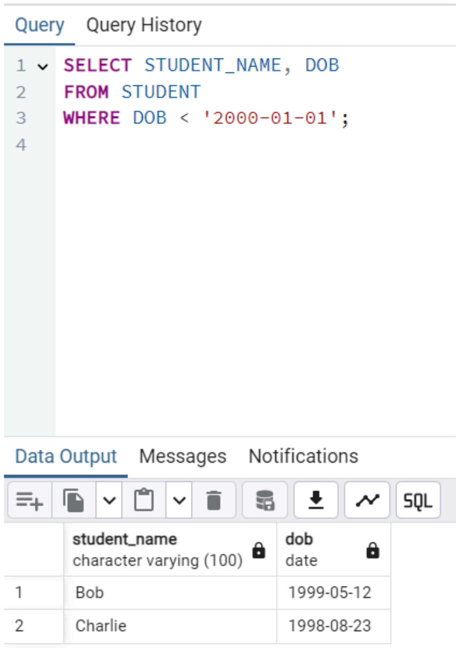
```sql
SELECT HOBBY
FROM STUD_HOBBY
WHERE STUDENT_ID = 3;
```

	hobby character varying (50)
1	Gaming



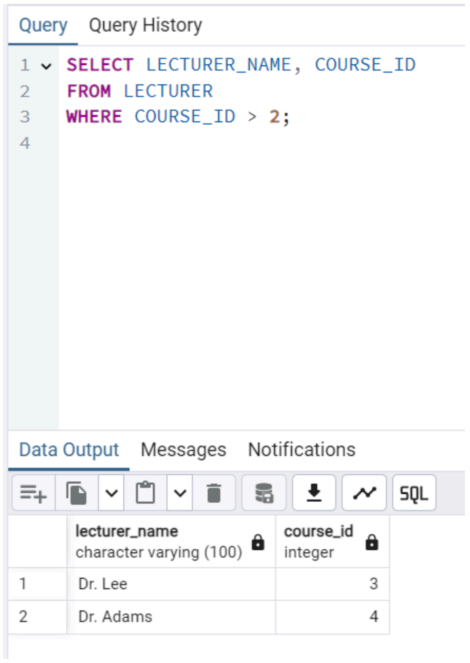
```sql
SELECT COURSE_NAME
FROM COURSE
WHERE COURSE_NAME LIKE '%Physics%';
```

	course_name character varying (100)
1	Physics



```sql
SELECT STUDENT_NAME, DOB
FROM STUDENT
WHERE DOB < '2000-01-01';
```

	student_name character varying (100)	dob date
1	Bob	1999-05-12
2	Charlie	1998-08-23



```
SELECT LECTURER_NAME, COURSE_ID
FROM LECTURER
WHERE COURSE_ID > 2;
```

	lecturer_name character varying (100)	course_id integer
1	Dr. Lee	3
2	Dr. Adams	4

Outcomes:

CO2: Apply data models to real world scenario

Questions:

Q1 Explain various data types used in SQL
SQL has data types for storing information: Numeric types (like INT), string types (like VARCHAR), date types (like DATE), and Boolean types (true/false). These help manage data effectively.

Q2 what is outer JOIN and why it is used? Explain its type with example
An Outer JOIN combines data from two tables, returning all records from one and matching records from another, with NULL for unmatched records. Types include Left, Right, and Full Outer JOINs, which help keep all relevant data.

Conclusion: (Conclusion to be based on the objectives and outcomes achieved)

Successfully created and made FROM and WHERE queries in school database. The school database in PostgreSQL organizes student, faculty, and course information effectively. It improves data management and accessibility, making it easier for the school to make informed decisions.

Grade: AA / AB / BB / BC / CC / CD /DD

Signature of faculty in-charge with date

References:

Books:

1. Elmasri and Navathe, "Fundamentals of Database Systems", 6th Edition, Pearson Education
2. Korth, Slberchatz,Sudarshan, :"Database System Concepts", 6th Edition, McGraw – Hill.

WebSite:

1. http://www.tutorialspoint.com/postgresql/
2. http://sage.virtual-labs.ac.in/home/pub/21/