Training Exercise - 2

Other Keywords, Aggregate Functions, Date Time, Conditional Statements, Constraints, Indexes, Sequences, Joins, Views, SQL Files, Back Up & Restore

- Write a select query with multiple conditions using ‘AND’ and ‘OR’.

```
1  select * from employee where employeeid=11 and (name='jinay' or name='shah')
```

Data Output | Messages | Notifications

	employeeid [PK] integer	name character varying (100)	email character varying (100)	phone_no character varying (15)	designation character varying (100)	department character varying (100)	birth_date date	join_date date	qualification character varying (100)
1	11	jinay	jinay@gmail.com	9725856499	trainee	sde	2003-05-22	2024-08-01	B.TECH

- Create a table employee where it contains id, name, city. Find the city which ends with ‘abad’. Enter 30 records scattered in different cities like Hyderabad, Ahmedabad, Mumbai, Delhi, Chennai, Kochin, Kolkatta, Pune, Bangalore.

CREATE TABLE employee (id SERIAL PRIMARY KEY,name VARCHAR(100),city VARCHAR(100));

INSERT INTO employee (name, city) VALUES ('John', 'Hyderabad'), ('Alice', 'Ahmedabad'), ('Bob', 'Mumbai'), ('Charlie', 'Delhi'), ('David', 'Chennai'), ('Emma', 'Kochin'), ('Frank', 'Kolkata'), ('Grace', 'Pune'), ('Henry', 'Bangalore'), ('Sophia', 'Hyderabad'), ('James', 'Ahmedabad'), ('Olivia', 'Mumbai'), ('Michael', 'Delhi'), ('Elizabeth', 'Chennai'), ('William', 'Kochin'), ('Isabella', 'Kolkata'), ('Daniel', 'Pune'), ('Emily', 'Bangalore'), ('Alexander', 'Hyderabad'), ('Mia', 'Ahmedabad'), ('Ethan', 'Mumbai'), ('Ava', 'Delhi'), ('Matthew', 'Chennai'), ('Charlotte', 'Kochin'), ('Liam', 'Kolkata'), ('Amelia', 'Pune'), ('Benjamin', 'Bangalore'), ('Abigail', 'Ahmedabad'), ('Lucas', 'Mumbai');

select * from employee where city like '%abad'

	id [PK] integer	name character varying (100)	city character varying (100)
1	1	John	Hyderabad
2	2	Alice	Ahmedabad
3	10	Sophia	Hyderabad
4	11	James	Ahmedabad
5	19	Alexander	Hyderabad
6	20	Mia	Ahmedabad
7	28	Abigail	Ahmedabad

- Search records where the city contains the string ‘under’.

select * from employee where city like '%under%'

	id [PK] integer	name character varying (100)	city character varying (100)

- Search records where the third last character of the city is ‘b’.

SELECT * FROM employee WHERE SUBSTRING(city FROM LENGTH(city) - 2 FOR 1) = 'b';

	id [PK] integer	name character varying (100)	city character varying (100)
1	1	John	Hyderabad
2	2	Alice	Ahmedabad
3	3	Bob	Mumbai
4	10	Sophia	Hyderabad
5	11	James	Ahmedabad
6	12	Olivia	Mumbai
7	19	Alexander	Hyderabad
8	20	Mia	Ahmedabad
9	21	Ethan	Mumbai
10	28	Abigail	Ahmedabad
11	29	Lucas	Mumbai

- Search the records where first characterof the city is ‘A’.

select * from employee where city like 'A%'

	id [PK] integer	name character varying (100)	city character varying (100)
1	2	Alice	Ahmedabad
2	11	James	Ahmedabad
3	20	Mia	Ahmedabad
4	28	Abigail	Ahmedabad

- Search the records where second Charator of the city is ‘o’.

select * from employee where substring(city from 2 for 1)='o';

	id [PK] integer	name character varying (100)	city character varying (100)
1	6	Emma	Kochin
2	7	Frank	Kolkata
3	15	William	Kochin
4	16	Isabella	Kolkata
5	24	Charlotte	Kochin
6	25	Liam	Kolkata

- Search first 10 records.

```
44  select * from employee limit 10;
```

Data Output | Messages | Notifications

	id [PK] integer	name character varying (100)	city character varying (100)
1	1	John	Hyderabad
2	2	Alice	Ahmedabad
3	3	Bob	Mumbai
4	4	Charlie	Delhi
5	5	David	Chennai
6	6	Emma	Kochin
7	7	Frank	Kolkata
8	8	Grace	Pune
9	9	Henry	Bangalore
10	10	Sophia	Hyderabad

- Search first 5 records where city is Mumbai

```
46  select * from employee where city='Mumbai' limit 5
```

Data Output | Messages | Notifications

	id [PK] integer	name character varying (100)	city character varying (100)
1	3	Bob	Mumbai
2	12	Olivia	Mumbai
3	21	Ethan	Mumbai
4	29	Lucas	Mumbai

- Search first 5 records where city is Mumbai or Bangalore.

```
46  select * from employee where city='Mumbai' or city='Bangalore' limit 5
```

Data Output | Messages | Notifications

	id [PK] integer	name character varying (100)	city character varying (100)
1	3	Bob	Mumbai
2	9	Henry	Bangalore
3	12	Olivia	Mumbai
4	18	Emily	Bangalore
5	21	Ethan	Mumbai

- Search the next 5 records skipping the first 5 records where city is Mumbai or Bangalore.

```
48  select * from employee where city='Mumbai' or city='Bangalore' offset 5 limit 5
```

Data Output | Messages | Notifications

	id [PK] integer	name character varying (100)	city character varying (100)
1	27	Benjamin	Bangalore
2	29	Lucas	Mumbai

- Sort the records where city is Mumbai or Bangalore by City Name.

```
50  select * from employee where city in ('Mumbai' , 'Bangalore') order by city
51
```

Data Output | Messages | Notifications

	id [PK] integer	name character varying (100)	city character varying (100)
1	18	Emily	Bangalore
2	9	Henry	Bangalore
3	27	Benjamin	Bangalore
4	3	Bob	Mumbai
5	21	Ethan	Mumbai
6	29	Lucas	Mumbai
7	12	Olivia	Mumbai

- Sort all the records of the table by ID in descending order.

```
52  select * from employee order by id desc
```

Data Output | Messages | Notifications

	id [PK] integer	name character varying (100)	city character varying (100)
1	29	Lucas	Mumbai
2	28	Abigail	Ahmedabad
3	27	Benjamin	Bangalore
4	26	Amelia	Pune
5	25	Liam	Kolkata
6	24	Charlotte	Kochin
7	23	Matthew	Chennai
8	22	Ava	Delhi
9	21	Ethan	Mumbai
10	20	Mia	Ahmedabad
11	19	Alexander	Hyderabad
12	18	Emily	Bangalore
13	17	Daniel	Pune

- Insert few records where the city is not entered. Search all the records where the city field is blank.

```
55 INSERT INTO employee (name, city) VALUES('John Doe', NULL),('Alice Smith', NULL),('Bob Johnson', NULL);
```

Data Output | Messages | Notifications

```
INSERT 0 3

Query returned successfully in 75 msec.
```

```
56 select * from employee where city is Null
```

Data Output | Messages | Notifications

	id [PK] integer	name character varying (100)	city character varying (100)
1	30	John Doe	[null]
2	31	Alice Smith	[null]
3	32	Bob Johnson	[null]

- Add a date field in the existing table. Search the records where date is in current year.

```
58 alter table employee add column join_date date
```

Data Output | Messages | Notifications

```
ALTER TABLE

Query returned successfully in 70 msec.
```

```
62 select * from employee where date_part('year',join_date)=date_part('year',current_date)
```

Data Output | Messages | Notifications

	id [PK] integer	name character varying (100)	city character varying (100)	join_date date
1	37	Michael Johnson	New York	2024-10-20

- Enter few duplicate records where name is duplicate. Select unique records from a table.

```
64  select distinct * from employee;
```

Data Output | Messages | Notifications

	id [PK] integer	name character varying (100)	city character varying (100)	join_date date
25	24	Charlotte	Kochin	[null]
26	11	James	Ahmedabad	[null]
27	9	Henry	Bangalore	[null]
28	14	Elizabeth	Chennai	[null]
29	12	Olivia	Mumbai	[null]
30	33	Emma Watson	London	2023-04-15
31	29	Lucas	Mumbai	[null]
32	30	John Doe	[null]	[null]
33	27	Benjamin	Bangalore	[null]
34	18	Emily	Bangalore	[null]
35	23	Matthew	Chennai	[null]
36	25	Liam	Kolkata	[null]
37	15	William	Kochin	[null]

- Enter a column amount in the table. Get a total of the complete amount.

```
66  alter table employee add column amount decimal(10,2)
```

Data Output | Messages | Notifications

```
ALTER TABLE

Query returned successfully in 54 msec.
```

```
74  select sum(amount) as total_amount from employee;
75
```

Data Output | Messages | Notifications

	total_amount numeric
1	6301.25

- Get total of amount by city.

```
76  select city,sum(amount) as total_amount from employee group by city;
77
```

Data Output | Messages | Notifications

	city character varying (100)	total_amount numeric
1	[null]	[null]
2	Mumbai	[null]
3	Pune	[null]
4	Paris	2000.00
5	New York	2500.75
6	Delhi	[null]
7	Kochin	[null]
8	Chennai	[null]
9	London	1800.50
10	Hyderabad	[null]
11	Bangalore	[null]
12	Kolkata	[null]
13	Ahmedabad	[null]

- Get avg of amount by city.

```
78 select city,avg(amount) as total_amount from employee group by city;
79
```

Data Output | Messages | Notifications

	city character varying (100)	total_amount numeric
1	[null]	[null]
2	Mumbai	[null]
3	Pune	[null]
4	Paris	2000.0000000000000000
5	New York	2500.7500000000000000
6	Delhi	[null]
7	Kochin	[null]
8	Chennai	[null]
9	London	1800.5000000000000000
10	Hyderabad	[null]
11	Bangalore	[null]
12	Kolkata	[null]
13	Ahmedabad	[null]

- Get maximum amount from all records

```
80 select max(amount) as max_amount from employee
81
```

Data Output | Messages | Notifications

	max_amount numeric
1	2500.75

- Get minimum amount from all records.

```
82  select min(amount) as max_amount from employee
83
```

Data Output | Messages | Notifications

	max_amount numeric
1	1800.50

- Fetch the quarter of the date field for all the records.

```
118 select name,join_date,extract(quarter from join_date) as quarter from employee;
119
```

Data Output | Messages | Notifications

	name character varying (100)	join_date date	quarter numeric
1	Sarah Johnson	2023-05-10	2
2	David Lee	2022-09-15	3
3	Emily Brown	2023-02-20	1
4	Michael Davis	2024-07-05	3
5	Jessica Martinez	2023-11-10	4
6	Daniel Anderson	2022-03-15	1
7	Emma Rodriguez	2023-08-20	3
8	William Taylor	2024-01-25	1
9	Olivia Wilson	2022-06-30	2
10	James Thomas	2023-10-05	4
11	Sophia White	2022-04-10	2
12	Alexander Jackson	2023-09-15	3
13	Isabella Harris	2024-02-20	1

- Fetch the year of the date field for all the records.

```
120 select *,extract(year from join_date) as year from employee;
121
```

Data Output | Messages | Notifications

	id [PK] integer	name character varying (100)	city character varying (100)	join_date date	amount numeric (10,2)	year numeric
1	41	Sarah Johnson	Los Angeles	2023-05-10	2200.75	2023
2	42	David Lee	Chicago	2022-09-15	1900.25	2022
3	43	Emily Brown	San Francisco	2023-02-20	2800.50	2023
4	44	Michael Davis	Seattle	2024-07-05	2100.00	2024
5	45	Jessica Martinez	Dallas	2023-11-10	2600.00	2023
6	46	Daniel Anderson	Houston	2022-03-15	2400.75	2022
7	47	Emma Rodriguez	Miami	2023-08-20	2300.50	2023
8	48	William Taylor	Atlanta	2024-01-25	2700.25	2024
9	49	Olivia Wilson	Boston	2022-06-30	2000.00	2022
10	50	James Thomas	Phoenix	2023-10-05	2500.00	2023
11	51	Sophia White	Denver	2022-04-10	2900.00	2022
12	52	Alexander Jackson	Philadelphia	2023-09-15	2200.75	2023
13	53	Isabella Harris	Detroit	2024-02-20	1900.25	2024

- Fetch the weekday of the date field for all the records.

```
122 select *,to_char(join_date,'day') as weekday from employee;
123
```

Data Output | Messages | Notifications

	id [PK] integer	name character varying (100)	city character varying (100)	join_date date	amount numeric (10,2)	weekday text
1	41	Sarah Johnson	Los Angeles	2023-05-10	2200.75	wednesday
2	42	David Lee	Chicago	2022-09-15	1900.25	thursday
3	43	Emily Brown	San Francisco	2023-02-20	2800.50	monday
4	44	Michael Davis	Seattle	2024-07-05	2100.00	friday
5	45	Jessica Martinez	Dallas	2023-11-10	2600.00	friday
6	46	Daniel Anderson	Houston	2022-03-15	2400.75	tuesday
7	47	Emma Rodriguez	Miami	2023-08-20	2300.50	sunday
8	48	William Taylor	Atlanta	2024-01-25	2700.25	thursday
9	49	Olivia Wilson	Boston	2022-06-30	2000.00	thursday
10	50	James Thomas	Phoenix	2023-10-05	2500.00	thursday
11	51	Sophia White	Denver	2022-04-10	2900.00	sunday
12	52	Alexander Jackson	Philadelphia	2023-09-15	2200.75	friday
13	53	Isabella Harris	Detroit	2024-02-20	1900.25	tuesday

- For all the records fetch whether it's a new admission or old admission. If the date is of current year it will be a new admission else it will be an old admission. Display, id, name and new/old admission. NOTE: Admission field not to be added in the table.

```
124 select id,name,case when extract(year from join_date)=extract(year from current_date) then 'new admission'
125                     else 'old admission'
126                     end as admission_status from employee
127
```

Data Output | Messages | Notifications

	id [PK] integer	name character varying (100)	admission_status text
1	41	Sarah Johnson	old admission
2	42	David Lee	old admission
3	43	Emily Brown	old admission
4	44	Michael Davis	new admission
5	45	Jessica Martinez	old admission
6	46	Daniel Anderson	old admission
7	47	Emma Rodriguez	old admission
8	48	William Taylor	new admission
9	49	Olivia Wilson	old admission
10	50	James Thomas	old admission
11	51	Sophia White	old admission
12	52	Alexander Jackson	old admission
13	53	Isabella Harris	new admission

- Add a primary key to the table as id.

```
128 ALTER TABLE employee
129 ADD CONSTRAINT pk_employee PRIMARY KEY (id);
130
131
```

Data Output | Messages | Notifications

```
ALTER TABLE

Query returned successfully in 40 msec.
```

- Create two tables one will be employee and another will be city. Add a primary key id in both the tables. Add a foreign key of city in the employee table as city_id.

```
133 create table city (id serial primary key,name varchar(100) not null )
134
135
```

Data Output | Messages | Notifications

```
CREATE TABLE

Query returned successfully in 72 msec.
```

```
135 create table employee (id serial primary key,name varchar(100) not null,city_id int not null,foreign key (city_id)
136                        references city(id))
```

Data Output | Messages | Notifications

```
CREATE TABLE

Query returned successfully in 48 msec.
```

- Add a not null constraint for name field in employee.

```
138  alter table employee alter column name set not null
```

Data Output | Messages | Notifications

```
ALTER TABLE

Query returned successfully in 41 msec.
```

- Add a new field in Code in the city table. Add a unique constraint on the code field.

```
140  alter table city add column code varchar(10)
141
142  alter table city add constraint unique_code unique(code)
```

Data Output | Messages | Notifications

```
ALTER TABLE

Query returned successfully in 41 msec.
```

- Add another table called Company and a primary key as id. Now add a foreign key of company in city table. Add a unique constraint with combination of company and code fields. Remove the old unique constraint with only code field.

```
144  CREATE TABLE Company (id SERIAL PRIMARY KEY);
```

Data Output | Messages | Notifications

```
CREATE TABLE

Query returned successfully in 40 msec.
```

```
146  ALTER TABLE city ADD COLUMN company_id INT, ADD CONSTRAINT fk_company FOREIGN KEY (company_id) REFERENCES Company(id);
```

Data Output | Messages | Notifications

```
ALTER TABLE

Query returned successfully in 41 msec.
```

```
148  alter table city add constraint unique_cmp_code unique(company_id,code)
```

Data Output | Messages | Notifications

```
ALTER TABLE

Query returned successfully in 72 msec.
```

```
150 alter table city drop constraint unique_code
```

Data Output | Messages | Notifications

```
ALTER TABLE

Query returned successfully in 41 msec.
```

- Check that the date is not before 2010-01-01 in the employee table using check constraint.

```
154 alter table employee add constraint check_date check(join_date>=date '2010-01-01')
155
```

Data Output | Messages | Notifications

```
ALTER TABLE

Query returned successfully in 41 msec.
```

- Create an index on the name field in City Table.

```
156 create index index_name on  city(name)
```

Data Output | Messages | Notifications

```
CREATE INDEX

Query returned successfully in 63 msec.
```

- Create an index on the date and city fields in Employee Table

```
160 create index emp_index on employee(city_id,join_date)
```

Data Output | Messages | Notifications

```
CREATE INDEX

Query returned successfully in 52 msec.
```

- Create an index on the name field in Employee table.

```
162 create index emp_nameindex on employee(name)
```

Data Output | Messages | Notifications

```
CREATE INDEX

Query returned successfully in 69 msec.
```

- Create an index on the name field in Company table. Remove the index.

```
164 create index cmp_name on company(id)
165
```

Data Output | Messages | Notifications

```
CREATE INDEX

Query returned successfully in 67 msec.
```

```
165 drop index cmp_name
```

Data Output | Messages | Notifications

```
DROP INDEX

Query returned successfully in 41 msec.
```

- Create a primary key in a new table where there is an auto generated number starting from 1 without create a sequence.

```
168 create table new_table(id serial ,primary key (id))
```

Data Output | Messages | Notifications

```
CREATE TABLE

Query returned successfully in 73 msec.
```

- Create a sequence starting from 1000. Create a primary key in a new table. When inserting records use this sequence.

```
170 create SEQUENCE start1000 start 1000
```

Data Output | Messages | Notifications

```
CREATE SEQUENCE

Query returned successfully in 64 msec.
```

```
172 create table new_table1 (id int default nextval('start1000') primary key)
```

Data Output | Messages | Notifications

```
CREATE TABLE

Query returned successfully in 65 msec.
```

- Create a sequence starting from 500. Create a primary key in a new table and assign default value from this sequence.

```
174  create SEQUENCE start500 start 500
```

Data Output | Messages | Notifications

```
CREATE SEQUENCE

Query returned successfully in 40 msec.
```

```
176  create table new_table2 (id int default nextval('start500') primary key)
```

Data Output | Messages | Notifications

```
CREATE TABLE

Query returned successfully in 67 msec.
```

- Delete the sequence which was created with 1000. Try to use the sequence to insert records.

cant delete sequence as it is associated with new_table1

```
180  INSERT INTO new_table1 (id) VALUES
181  (nextval('start1000')),
182  (nextval('start1000'));
```

Data Output | Messages | Notifications

```
INSERT 0 2

Query returned successfully in 57 msec.
```

- Display the fields id, name, city name from employee and city tables using inner join and aliases.

```
184 SELECT e.id AS employee_id, e.name AS employee_name, c.name AS city_name
185 FROM employee AS e INNER JOIN city AS c ON e.city_id = c.id;
186
```

Data Output | Messages | Notifications

	employee_id integer	employee_name character varying (100)	city_name character varying (100)
1	1	John Doe	City1
2	2	Alice Smith	City2
3	3	Bob Johnson	City3
4	4	Emma Watson	City4
5	5	Michael Davis	City5
6	6	Sarah Lee	City6
7	7	David Brown	City7
8	8	Olivia Wilson	City8
9	9	James Taylor	City9
10	10	Sophia Martinez	City10

- Display id, name, city name and company name from employee, city and company tables.

```
187 select e.id as employee_id,e.name as employee_name,c.name as city_name,cp.id as company_id from employee as e inner join
188 city as c on e.city_id = c.id inner join company as cp on c.company_id = cp.id
189
```

Data Output | Messages | Notifications

	employee_id integer	employee_name character varying (100)	city_name character varying (100)	company_id integer
1	1	John Doe	City1	1
2	2	Alice Smith	City2	2
3	3	Bob Johnson	City3	3
4	4	Emma Watson	City4	4
5	5	Michael Davis	City5	5
6	6	Sarah Lee	City6	6
7	7	David Brown	City7	7
8	8	Olivia Wilson	City8	8
9	9	James Taylor	City9	9
10	10	Sophia Martinez	City10	10

- Create a view using the above select query result.

```
190 create view emp_city_cmp as select e.id as employee_id,e.name as employee_name,c.name as city_name,cp.id as company_id
191 from employee as e inner join city as c on e.city_id = c.id inner join company as cp on c.company_id = cp.id
```

Data Output | Messages | Notifications

```
CREATE VIEW

Query returned successfully in 68 msec.
```

- Delete the view which is created above.s

```
193  drop view emp_city_cmp
```

Data Output | Messages | Notifications

```
DROP VIEW

Query returned successfully in 68 msec.
```

- Insert 15 records using an sql file. In the same file update 5 records of the city Mumbai set join_date as current_date.

```
1  INSERT INTO employee (name, city_id, join_date) VALUES
2  ('John Doe', 1, '2023-01-01'),
3  ('Alice Smith', 2, '2023-02-01'),
4  ('Bob Johnson', 3, '2023-03-01'),
5  ('Emma Watson', 4, '2023-04-01'),
6  ('Michael Davis', 5, '2023-05-01'),
7  ('Sarah Lee', 6, '2023-06-01'),
8  ('David Brown', 7, '2023-07-01'),
9  ('Olivia Wilson', 8, '2023-08-01'),
10 ('James Taylor', 9, '2023-09-01'),
11 ('Sophia Martinez', 10, '2023-10-01'),
12 ('Matthew Clark', 1, '2023-11-01'),
13 ('Emily Rodriguez', 2, '2023-12-01'),
14 ('Daniel Garcia', 3, '2024-01-01'),
15 ('Madison Martinez', 4, '2024-02-01'),
16 ('Ethan Wilson', 5, '2024-03-01');
17
18
19 update employee set join_date=current_date where city_id=(select city_id from city where name='Mumbai')
```

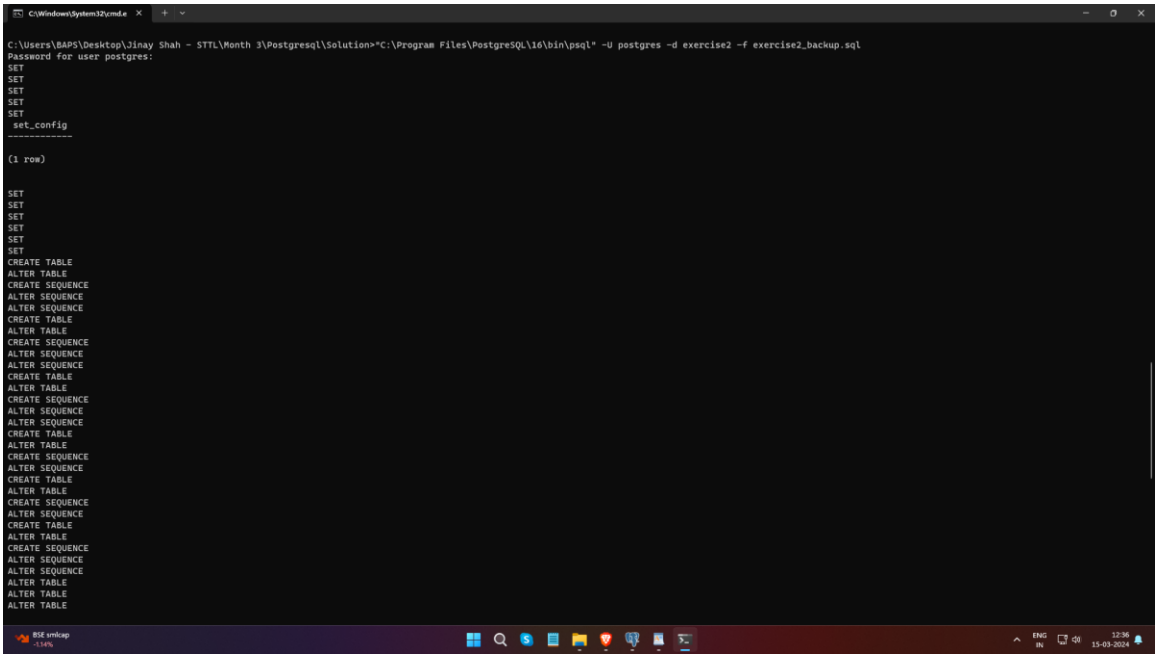
Data Output | Messages | Notifications

```
UPDATE 25

Query returned successfully in 38 msec.
```

- Create a backup of the database and restore it using PSQL.

```
C:\Users\BAPS\Desktop\Jinay Shah - STTL\Month 3\Postgresql\Solution>"C:\Program Files\PostgreSQL\16\bin\pg_dump" -U post
gres -d exercise2 > exercise2_backup.sql
Password:

C:\Users\BAPS\Desktop\Jinay Shah - STTL\Month 3\Postgresql\Solution>
```

Name	Date modified	Type	Size
exercise1sql	14-03-2024 18:04	Microsoft SQL Ser...	1 KB
exercise2	15-03-2024 11:46	Microsoft SQL Ser...	7 KB
exercise2_backup	15-03-2024 12:32	Microsoft SQL Ser...	10 KB
question42sql	15-03-2024 11:47	Microsoft SQL Ser...	1 KB
STTL-PostgreSQL Exercise - 1	14-03-2024 18:12	Office Open XML ...	1,041 KB
STTL-PostgreSQL Exercise - 2	15-03-2024 11:49	Office Open XML ...	2,217 KB



- Create a backup of the database and restore using pg_restore