DBMS
ASSIGNMENT: 3
VERSION: 2
202412012
JAYESH S CHAUHAN

Q1. Create a trigger on table of your choice to check if the primary key ID already exists or not before inserting a new record. & Send a custom reply instead of an error message.

Query:
CREATE TABLE "EC_DB".MESSAGE (MESSAGE TEXT);


```
CREATE OR REPLACE FUNCTION "EC_DB".primary_key_check()
RETURNS trigger
LANGUAGE 'plpgsql'
AS $BODY$
BEGIN
   IF EXISTS (SELECT 1 FROM "EC_DB".users WHERE user_id = NEW.user_id) THEN
      INSERT INTO "EC_DB".message(message) VALUES (concat('User ID ', NEW.user_id, ' already exists.'));
      RETURN NULL;
   ELSE
      RETURN NEW;
   END IF;
END;
$BODY$;
```

Query Query History

```
CREATE OR REPLACE FUNCTION "EC_DB".primary_key_check()
RETURNS trigger
LANGUAGE 'plpgsql'
AS $BODY$
BEGIN
    IF EXISTS (SELECT 1 FROM "EC_DB".users WHERE user_id = NEW.user_id) THEN
        INSERT INTO "EC_DB".message(message) VALUES (concat('User ID ', NEW.user_id, ' already exists.'));
        RETURN NULL;
    ELSE
        RETURN NEW;
    END IF;
END;
$BODY$;
```

Data Output Messages Notifications

```
CREATE FUNCTION

Query returned successfully in 102 msec.
```

CREATE TRIGGER "trigger_primary_key_check"
BEFORE INSERT
ON "EC_DB".users
FOR EACH ROW
EXECUTE PROCEDURE "EC_DB".primary_key_check();

Query Query History

```
CREATE TRIGGER "trigger_primary_key_check"
BEFORE INSERT
ON "EC_DB".users
FOR EACH ROW
EXECUTE PROCEDURE "EC_DB".primary_key_check();
```

Data Output Messages Notifications

```
CREATE TRIGGER

Query returned successfully in 50 msec.
```

INSERT INTO "EC_DB".users (user_id, username, email, password, first_name, last_name, address, phone_number)
VALUES (69, 'Raj', 'raj@gmail.com', 'raj123', 'Raj', 'Patel', 'Ahmedabad', '9876543210');

Query Query History

```
INSERT INTO "EC_DB".users (user_id, username, email, password, first_name, last_name, address, phone_number)
VALUES (69, 'Raj', 'raj@gmail.com', 'raj123', 'Raj', 'Patel', 'Ahmedabad', '9876543210');
```

Data Output Messages Notifications

```
INSERT 0 0

Query returned successfully in 89 msec.
```

SELECT * FROM "EC_DB".message;

Query Query History

```
SELECT * FROM "EC_DB".message;
```

Data Output Messages Notifications

	message text
1	User ID 69 already exists.

Q2. Create a trigger on the Table of your choice to check if the Foreign key ID already exists or not before inserting a new record. & Send a custom reply instead of an error message.

Query:
CREATE TABLE "EC_DB".message2 (MESSAGE TEXT);

Query Query History

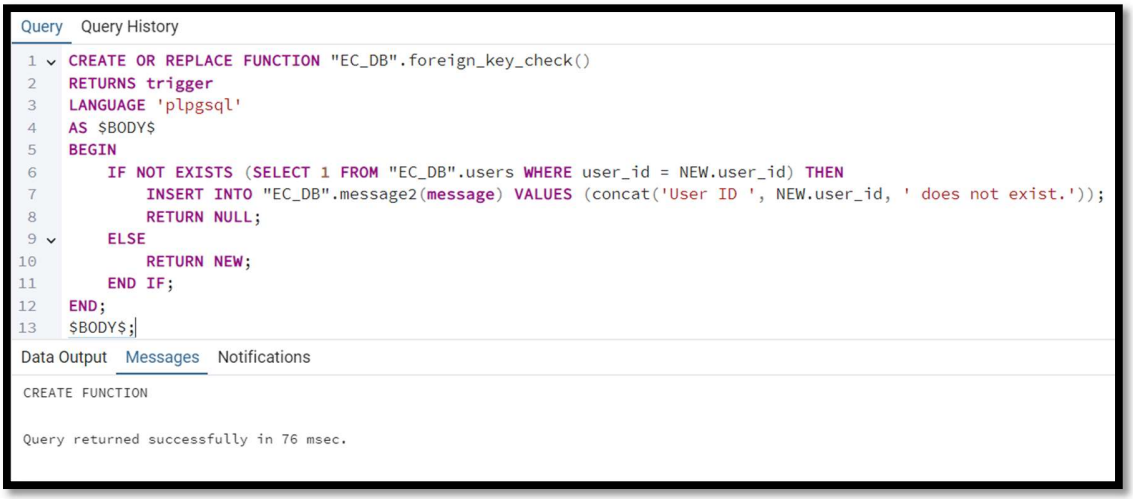
```
CREATE TABLE "EC_DB".message2 (MESSAGE TEXT);
```

Data Output Messages Notifications

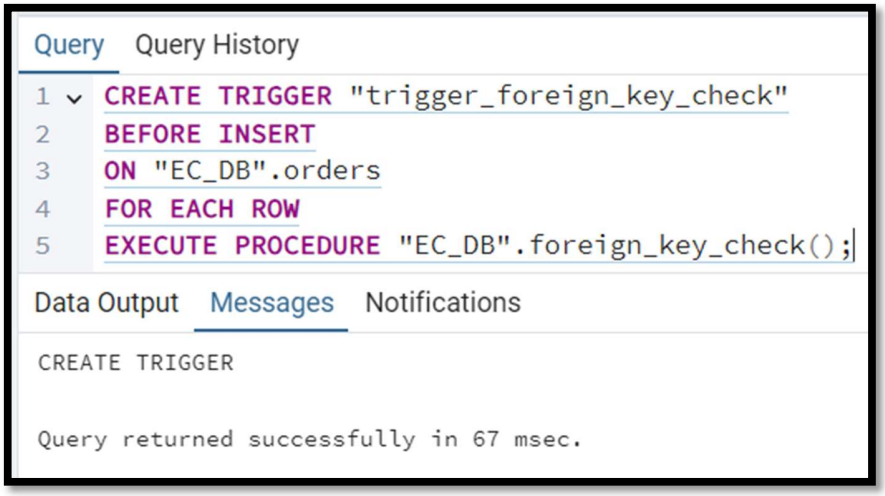
```
CREATE TABLE

Query returned successfully in 70 msec.
```

CREATE OR REPLACE FUNCTION "EC_DB".foreign_key_check()
RETURNS trigger

```
LANGUAGE 'plpgsql'
AS $BODY$
BEGIN
   IF NOT EXISTS (SELECT 1 FROM "EC_DB".users WHERE user_id = NEW.user_id) THEN
      INSERT INTO "EC_DB".message2(message) VALUES (concat('User ID ', NEW.user_id, ' does not exist.'));
      RETURN NULL;
   ELSE
      RETURN NEW;
   END IF;
END;
$BODY$;
```

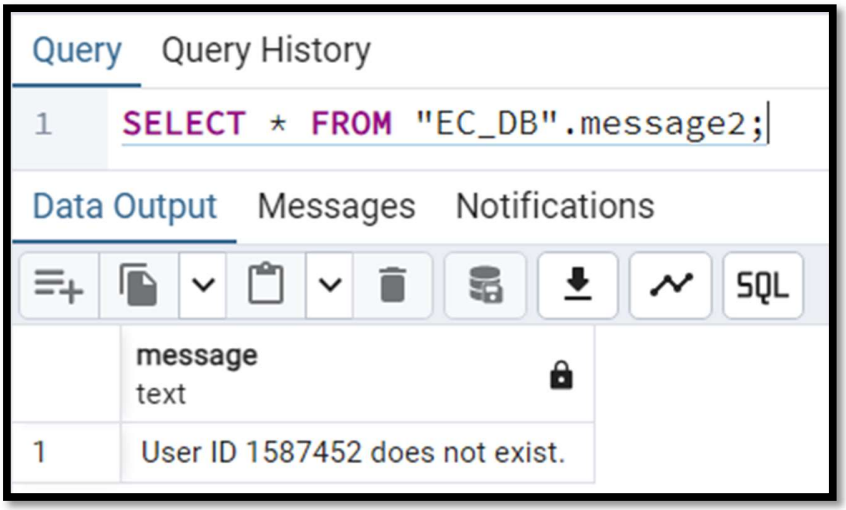



```
CREATE TRIGGER "trigger_foreign_key_check"
BEFORE INSERT
ON "EC_DB".orders
FOR EACH ROW
EXECUTE PROCEDURE "EC_DB".foreign_key_check();
```



INSERT INTO "EC_DB".orders (order_id, user_id, order_date, shipping_address, total_amount, status)
VALUES (101, 1587452, '2024-08-24 10:00:00', 'Some Address', 250.00, 'Pending');

SELECT * FROM "EC_DB".message2;



Q3. Write a SQL function that takes a product's product_id and a discount percentage as inputs and returns the discounted price of the product.

Query:

```
CREATE OR REPLACE FUNCTION "EC_DB".discounted_price(
   p_product_id INT,
   p_discount_percentage DECIMAL
)
RETURNS DECIMAL(10, 2)
LANGUAGE 'plpgsql'
AS $BODY$
DECLARE
   count_price DECIMAL(10, 2);
   count_discounted_price DECIMAL(10, 2);
BEGIN
   SELECT price INTO count_price
   FROM "EC_DB".products
```

```
    WHERE product_id = p_product_id;
    count_discounted_price := count_price - (count_price * p_discount_percentage / 100);
    RETURN count_discounted_price;
END;
$BODY$;
```

Query Query History

```
CREATE OR REPLACE FUNCTION "EC_DB".discounted_price(
    p_product_id INT,
    p_discount_percentage DECIMAL
)
RETURNS DECIMAL(10, 2)
LANGUAGE 'plpgsql'
AS $BODY$
DECLARE
    count_price DECIMAL(10, 2);
    count_discounted_price DECIMAL(10, 2);
BEGIN
    SELECT price INTO count_price
    FROM "EC_DB".products
    WHERE product_id = p_product_id;
    count_discounted_price := count_price - (count_price * p_discount_percentage / 100);
    RETURN count_discounted_price;
END;
$BODY$;
```

Data Output Messages Notifications

```
CREATE FUNCTION

Query returned successfully in 60 msec.
```

SELECT "EC_DB".discounted_price(12, 20);

Query Query History

```
SELECT "EC_DB".discounted_price(12, 20);
```

Data Output Messages Notifications

	discounted_price numeric
1	1168.74

Q4. Create a stored procedure named add_order that takes the user_id, shipping_address, and a list of product_id and quantity pairs as inputs, and inserts a new order into the orders and order_details tables. The procedure should also update the stock quantity of the products.

Query:

```
CREATE OR REPLACE PROCEDURE "EC_DB".add_order(
   p_user_id INT,
   p_shipping_address TEXT,
   p_product_quantity_pairs JSONB
)
LANGUAGE 'plpgsql'
AS $BODY$
DECLARE
   v_order_id INT;
   v_total_amount DECIMAL(10, 2) := 0;
   v_product_id INT;
   v_quantity INT;
   v_price DECIMAL(10, 2);
   v_stock_quantity INT;
BEGIN
   BEGIN
      INSERT INTO "EC_DB".orders(user_id, order_date, shipping_address, total_amount, status)
      VALUES (p_user_id, NOW(), p_shipping_address, 0, 'Pending')
      RETURNING order_id INTO v_order_id;
      FOR v_product_id, v_quantity IN SELECT * FROM jsonb_each_text(p_product_quantity_pairs)
      LOOP
         v_quantity := v_quantity::INT;
         SELECT price, stock_quantity INTO v_price, v_stock_quantity
         FROM "EC_DB".products
         WHERE product_id = v_product_id;
         IF v_quantity > v_stock_quantity THEN
            RAISE EXCEPTION 'Not enough stock for product ID %', v_product_id;
         END IF;
         INSERT INTO "EC_DB".order_details(order_id, product_id, quantity, price)
         VALUES (v_order_id, v_product_id, v_quantity, v_price);
         v_total_amount := v_total_amount + (v_price * v_quantity);
         UPDATE "EC_DB".products
         SET stock_quantity = stock_quantity - v_quantity
         WHERE product_id = v_product_id;
      END LOOP;
UPDATE "EC_DB".orders
      SET total_amount = v_total_amount
```

```
    WHERE order_id = v_order_id;
    COMMIT;
  EXCEPTION
    WHEN OTHERS THEN
      ROLLBACK;
      RAISE;
  END;
END;
$BODY$;
```

Query Query History

```
CREATE OR REPLACE PROCEDURE "EC_DB".add_order(
    p_user_id INT,
    p_shipping_address TEXT,
    p_product_quantity_pairs JSONB
)
LANGUAGE 'plpgsql'
AS $BODY$
DECLARE
    v_order_id INT;
    v_total_amount DECIMAL(10, 2) := 0;
    v_product_id INT;
    v_quantity INT;
    v_price DECIMAL(10, 2);
    v_stock_quantity INT;
BEGIN
    BEGIN
        INSERT INTO "EC_DB".orders(user_id, order_date, shipping_address, total_amount, status)
        VALUES (p_user_id, NOW(), p_shipping_address, 0, 'Pending')
        RETURNING order_id INTO v_order_id;
        FOR v_product_id, v_quantity IN SELECT * FROM jsonb_each_text(p_product_quantity_pairs)
        LOOP
            v_quantity := v_quantity::INT;
            SELECT price, stock_quantity INTO v_price, v_stock_quantity
            FROM "EC_DB".products
            WHERE product_id = v_product_id;
```

Data Output Messages Notifications

```
CREATE PROCEDURE

Query returned successfully in 57 msec.
```

Total rows: 1 of 1 Query complete 00:00:00.057

```
CALL "EC_DB".add_order(
  60,
  '123 Main St, Anytown, USA',
  '{"60": "2"}'
);
```

Q5. Write a trigger that automatically decreases the stock quantity of a product in the products table when a new order is inserted into the order details table.

Query:

```
CREATE OR REPLACE FUNCTION "EC_DB".update_stock()
```

```
RETURNS TRIGGER
LANGUAGE 'plpgsql'
AS $BODY$
BEGIN
   UPDATE "EC_DB".products
   SET stock_quantity = stock_quantity - NEW.quantity
   WHERE product_id = NEW.product_id;
   RETURN NEW;
END;
$BODY$;
```

Query Query History

```
1  CREATE OR REPLACE FUNCTION "EC_DB".update_stock()
2  RETURNS TRIGGER
3  LANGUAGE 'plpgsql'
4  AS $BODY$
5  BEGIN
6      UPDATE "EC_DB".products
7      SET stock_quantity = stock_quantity - NEW.quantity
8      WHERE product_id = NEW.product_id;
9      RETURN NEW;
10 END;
11 $BODY$;
```

Data Output Messages Notifications

```
CREATE FUNCTION

Query returned successfully in 64 msec.
```

```
CREATE TRIGGER "trigger_update_stock"
AFTER INSERT
ON "EC_DB".order_details
FOR EACH ROW
EXECUTE FUNCTION "EC_DB".update_stock();
```

Query Query History

```
1  CREATE TRIGGER "trigger_update_stock"
2  AFTER INSERT
3  ON "EC_DB".order_details
4  FOR EACH ROW
5  EXECUTE FUNCTION "EC_DB".update_stock();
```

Data Output Messages Notifications

```
CREATE TRIGGER

Query returned successfully in 94 msec.
```

Before:
SELECT * FROM "EC_DB".order_details;

Data Output Messages Notifications

	order_detail_id [PK] integer	order_id integer	product_id integer	quantity integer	price numeric (10,2)
1	1	46	7	10	5478.67
2	2	35	17	1	6992.10
3	3	51	15	2	3369.91
4	4	11	33	8	9818.68
5	5	48	48	6	685.71

Total rows: 300 of 300 Query complete 00:00:00.496

SELECT * FROM "EC_DB".products;

Data Output Messages Notifications

	product_id [PK] integer	name character varying (100)	description text	price numeric (10,2)	stock_quantity integer	category_id integer
1	1	Mobile Phone	Portable communication device with internet access and app...	7498.65	28	1
2	2	Laptop	Compact computer for personal and professional use.	2100.47	69	1
3	3	Smart Watch	Wearable device for tracking fitness and notifications.	2784.21	72	1
4	4	Headphones	Audio device for listening to music or calls privately.	6992.10	18	1
5	5	Tablet	Touchscreen device for media consumption and productivity.	1181.34	95	1

Total rows: 50 of 50 Query complete 00:00:00.086

Apply Query:
INSERT INTO "EC_DB".order_details(order_detail_id, order_id, product_id, quantity, price)
VALUES (301, 50, 1, 3, 9500);

Query Query History

```
INSERT INTO "EC_DB".order_details(order_detail_id, order_id, product_id, quantity, price)
VALUES (301, 50, 1, 3, 9500);
```

Data Output Messages Notifications

```
INSERT 0 1

Query returned successfully in 139 msec.
```

After:
SELECT * FROM "EC_DB".order_details;

Data Output Messages Notifications

	order_detail_id [PK] integer	order_id integer	product_id integer	quantity integer	price numeric (10,2)
297	297	43	24	4	7498.65
298	298	56	30	9	6725.63
299	299	14	32	4	4643.25
300	300	2	21	7	7900.81
301	301	50	1	3	9500.00

Total rows: 301 of 301 Query complete 00:00:00.179

SELECT * FROM "EC_DB".products;

Data Output Messages Notifications

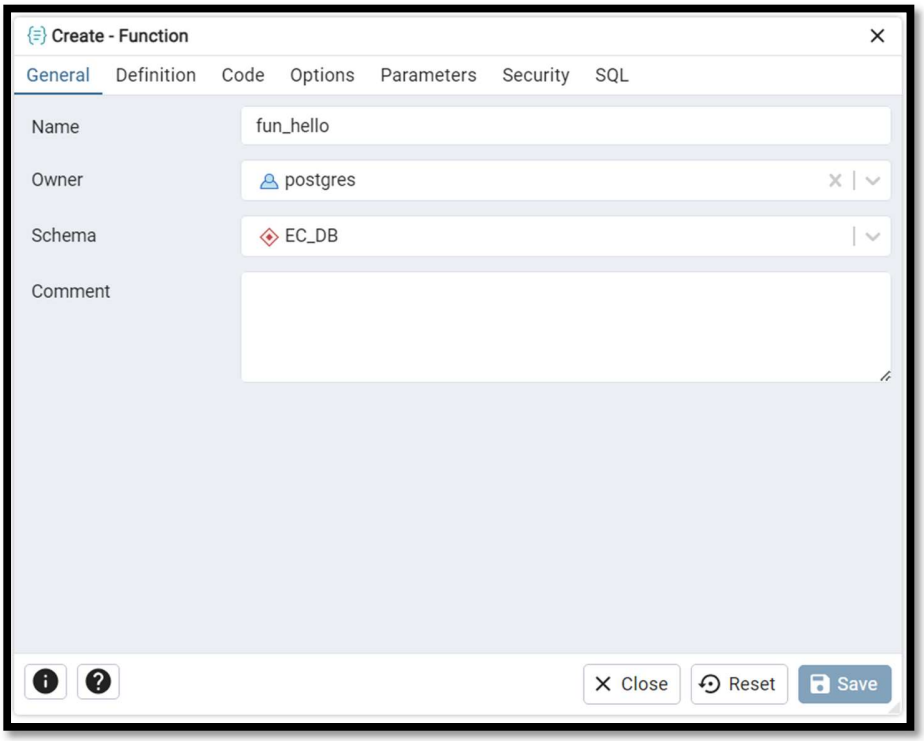
	product_id [PK] integer	name character varying (100)	description text	price numeric (10,2)	stock_quantity integer	category_id integer
46	47	Dining Table	Table used for meals in a dining area.	3303.66	32	10
47	48	Chair	Single-seat furniture for sitting.	167.62	50	10
48	49	Bed	Furniture for sleeping and resting	2431.66	97	10
49	50	Wardrobe	Storage unit for clothes and accessories.	2743.24	43	10
50	1	Mobile Phone	Portable communication device with internet access and app...	7498.65	25	1

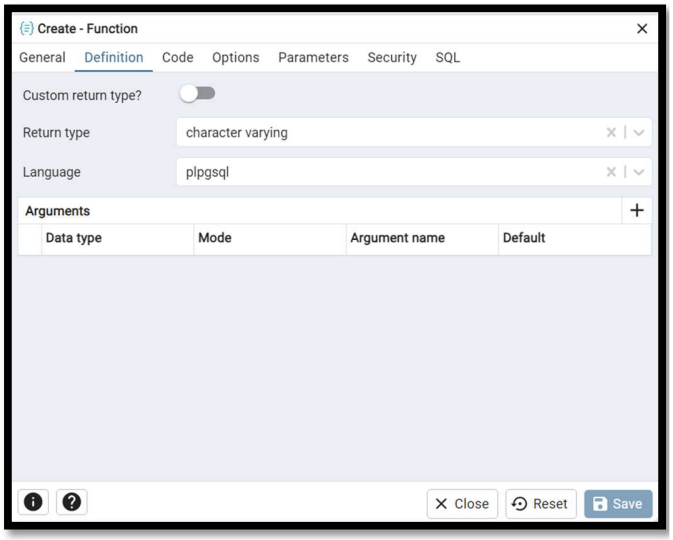
Total rows: 50 of 50 Query complete 00:00:00.080

Practice Set:

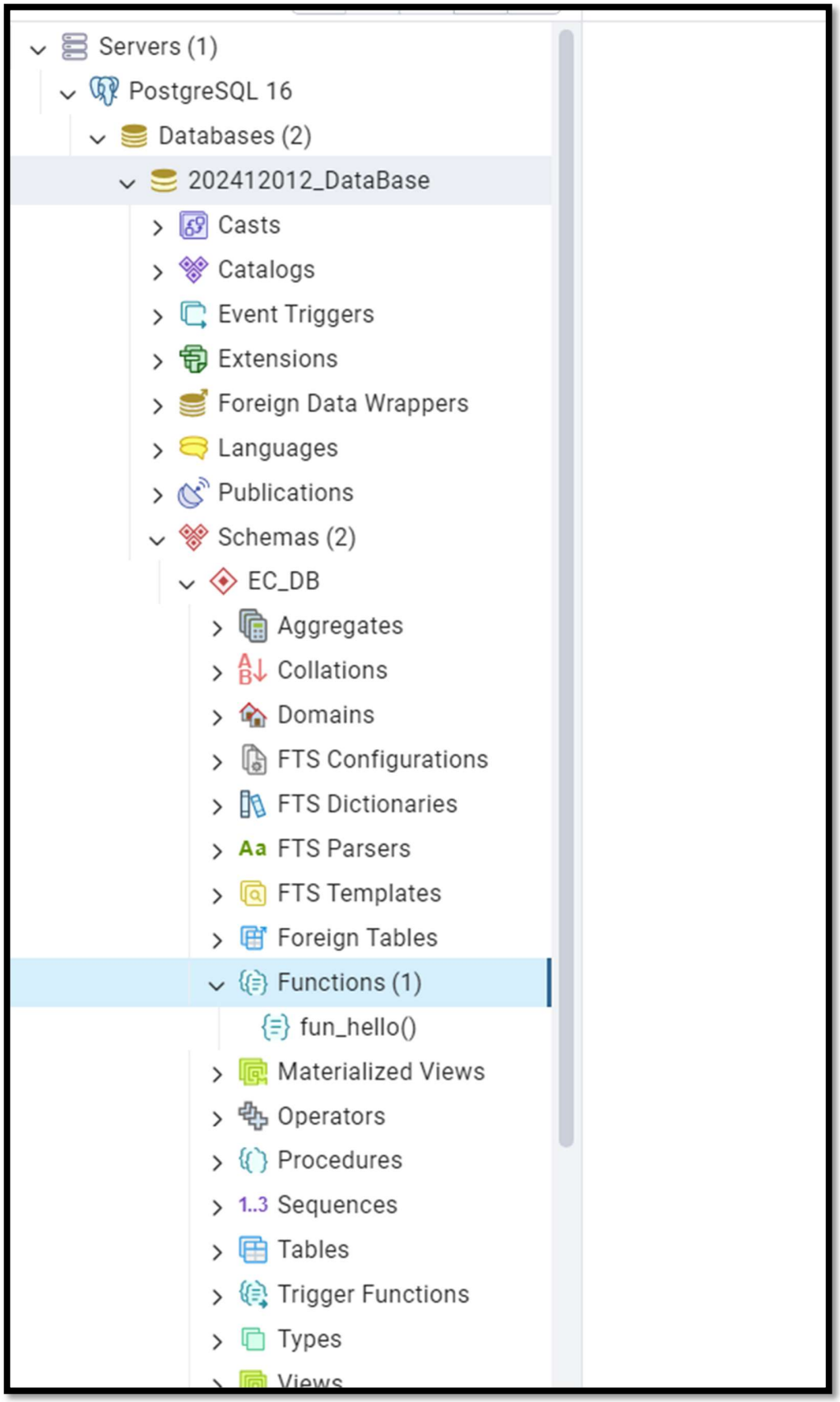
I. Understand & Run functions.

1. Create a simple function to print “HELLO WORLD” using GUI.


Create - Function
General
Definition
Code
Options
Parameters
Security
SQL
Name
fun_hello
Owner
postgres
Schema
EC_DB
Comment
Close
Reset
Save


Create - Function
General
Definition
Code
Options
Parameters
Security
SQL
Custom return type?
Return type
character varying
Language
plpgsql
Arguments
Data type
Mode
Argument name
Default
Close
Reset
Save


Create - Function
General
Definition
Code
Options
Parameters
Security
SQL
BEGIN
RETURN 'Hello World!';
END
Close
Reset
Save

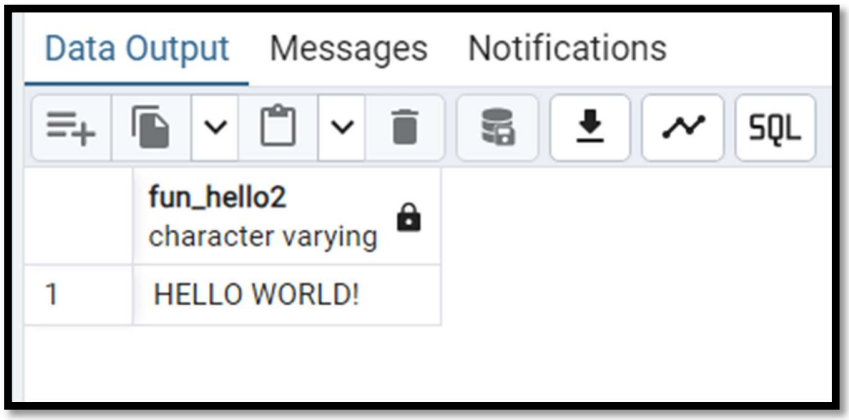

Servers (1)
PostgreSQL 16
Databases (2)
202412012_DataBase
Casts
Catalogs
Event Triggers
Extensions
Foreign Data Wrappers
Languages
Publications
Schemas (2)
EC_DB
Aggregates
Collations
Domains
FTS Configurations
FTS Dictionaries
FTS Parsers
FTS Templates
Foreign Tables
Functions (1)
fun_hello()
Materialized Views
Operators
Procedures
Sequences
Tables
Trigger Functions
Types
Views

2. Create a simple function to print “HELLO WORLD” using SQL.

```
set search_path to "EC_DB";

CREATE OR REPLACE FUNCTION "EC_DB"."fun_hello2 "()
RETURNS character varying
LANGUAGE 'plpgsql'
AS $BODY$ BEGIN
Return 'HELLO WORLD!';
END;
$BODY$;
```

3. Using the function. “Function calls”.

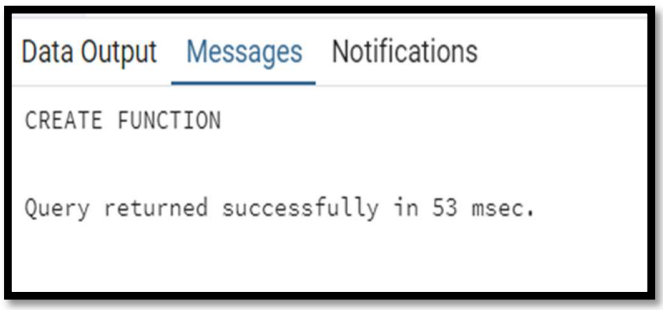
```
SELECT "EC_DB"."fun_hello2"();
```

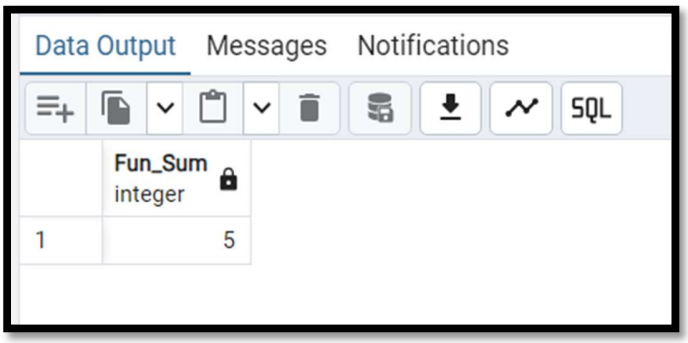


4. Create functions with parameters that return the SUM of two numbers.

```
CREATE OR REPLACE FUNCTION "EC_DB"."Fun_Sum"(a integer, b integer)
RETURNS INTEGER
```

```
LANGUAGE 'plpgsql'
AS $BODY$ BEGIN
return (a+b);
END;
$BODY$;

SELECT "EC_DB"."Fun_Sum"(2, 3)
```

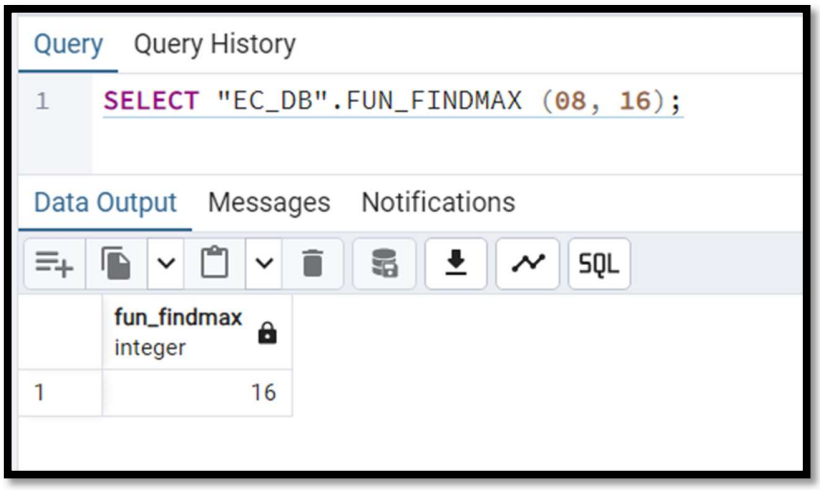




5. Create a function with If condition to find the largest number of two.

```
CREATE
OR REPLACE FUNCTION "EC_DB".FUN_FINDMAX (A INT, B INT) RETURNS INTEGER LANGUAGE 'plpgsql' AS
$BODY$
DECLARE C INTEGER;
BEGIN IF (A > B) THEN ELSE C = B;
END IF;
RETURN C;
END;
$BODY$;
```

SELECT "EC_DB".FUN_FINDMAX (08, 16);



6. Create functions with a table as a return value.

```
CREATE
OR REPLACE FUNCTION "EC_DB".FUN_RTBL1 () RETURNS TABLE (A INT, B CHARACTER VARYING(30))
LANGUAGE 'plpgsql' AS $BODY$
BEGIN
RETURN QUERY EXECUTE format ('SELECT user_id, username FROM "EC_DB".users');
END;
$BODY$;
```

SELECT "EC_DB".FUN_RTBL1 ()

Data Output Messages Notifications

	fun_rtbl1 record
1	(1,mamooty17)
2	(2,stuvantara)
3	(3,hrishita94)
4	(4,jivin46)
5	(5,adash)
6	(6,bkapoor)
7	(7,birhrishita)
8	(8,rgola)
9	(9,dasguptaneysa)
10	(10,siyengar)

Total rows: 100 of 100 Query complete 00:00:00.099

7. Create functions with a Temporary table and use of FOR loop.

```
CREATE
OR REPLACE FUNCTION "EC_DB".FUN_LOOP () RETURNS TABLE (A INTEGER, B CHARACTER VARYING)
LANGUAGE 'plpgsql' AS $BODY$
DECLARE
R_LIST2 record;
BEGIN
CREATE TEMP TABLE test1 (al int, bl character varying (30)) ON COMMIT DROP;
FOR R_LIST2 in (select user_id, username from "EC_DB".users)
loop
Insert into test1 (al, bl) values (R_LIST2.user_id,R_LIST2.username); end loop;
RETURN QUERY TABLE test1;
END;
$BODY$;
```

Query Query History

```
CREATE
OR REPLACE FUNCTION "EC_DB".FUN_LOOP () RETURNS TABLE (A INTEGER, B CHARACTER VARYING) LANGUAGE 'plpgsql' AS $BODY$
DECLARE
R_LIST2 record;
BEGIN
CREATE TEMP TABLE test1 (al int, bl character varying (30)) ON COMMIT DROP;
FOR R_LIST2 in (select user_id, username from "EC_DB".users)
loop
Insert into test1 (al, bl) values (R_LIST2.user_id,R_LIST2.username); end loop;
RETURN QUERY TABLE test1;
END;
$BODY$;
```

Data Output Messages Notifications

```
CREATE FUNCTION

Query returned successfully in 61 msec.
```

SELECT "EC_DB".fun_loop()

Data Output Messages Notifications

	fun_loop record
1	(1,mamooty17)
2	(2,stuvantara)
3	(3,hrishita94)
4	(4,jivin46)
5	(5,adash)
6	(6,bkapoor)
7	(7,birhrishita)
8	(8,rgola)
9	(9,dasguptaneysa)
10	(10,siyengar)

Total rows: 100 of 100 Query complete 00:00:00.059

II. Use triggers to execute functions.

1. Create a trigger function.

```
create table "EC_DB".message (m char varying);
CREATE OR REPLACE FUNCTION "EC_DB".Trigger_fun()
RETURNS trigger
LANGUAGE 'plpgsql'
```

AS $BODY$
BEGIN
Insert into "EC_DB".message(m) values (concat('New id added=',NEW.user_id));
RETURN NEW;
END
$BODY$;

Query Query History

```
1  create table "EC_DB".message (m char varying);
2  CREATE OR REPLACE FUNCTION "EC_DB".Trigger_fun()
3  RETURNS trigger
4  LANGUAGE 'plpgsql'
5  AS $BODY$
6  BEGIN
7  Insert into "EC_DB".message(m) values (concat('New id added=',NEW.user_id));
8  RETURN NEW;
9  END
10 $BODY$;
```

Data Output Messages Notifications

```
CREATE FUNCTION

Query returned successfully in 66 msec.
```

CREATE TRIGGER "Trigger_insert"
AFTER INSERT
ON "EC_DB".users
FOR EACH ROW
EXECUTE PROCEDURE "EC_DB".Trigger_fun();

Query Query History

```
1 CREATE TRIGGER "Trigger_insert"
2 AFTER INSERT
3 ON "EC_DB".users
4 FOR EACH ROW
5 EXECUTE PROCEDURE "EC_DB".Trigger_fun();
```

Data Output Messages Notifications

```
CREATE TRIGGER

Query returned successfully in 54 msec.
```

INSERT into "EC_DB".users values(0810, 'Jayesh', 'jayesh@gmail.com', 'jay123', 'jayesh', 'chauhan', 'mumbai', '9874521245');

Query Query History

```
1  INSERT into "EC_DB".users values(0810, 'Jayesh', 'jayesh@gmail.com', 'jay123', 'jayesh', 'chauhan', 'mumbai', '9874521245');
```

Data Output Messages Notifications

```
INSERT 0 1

Query returned successfully in 69 msec.
```

SELECT * FROM "EC_DB".message;

Query Query History

```
1  SELECT * FROM "EC_DB".message;
```

Data Output Messages Notifications

	m character varying
1	New id added=810