

# EXERCISE-16

## PROCEDURES AND FUNCTIONS

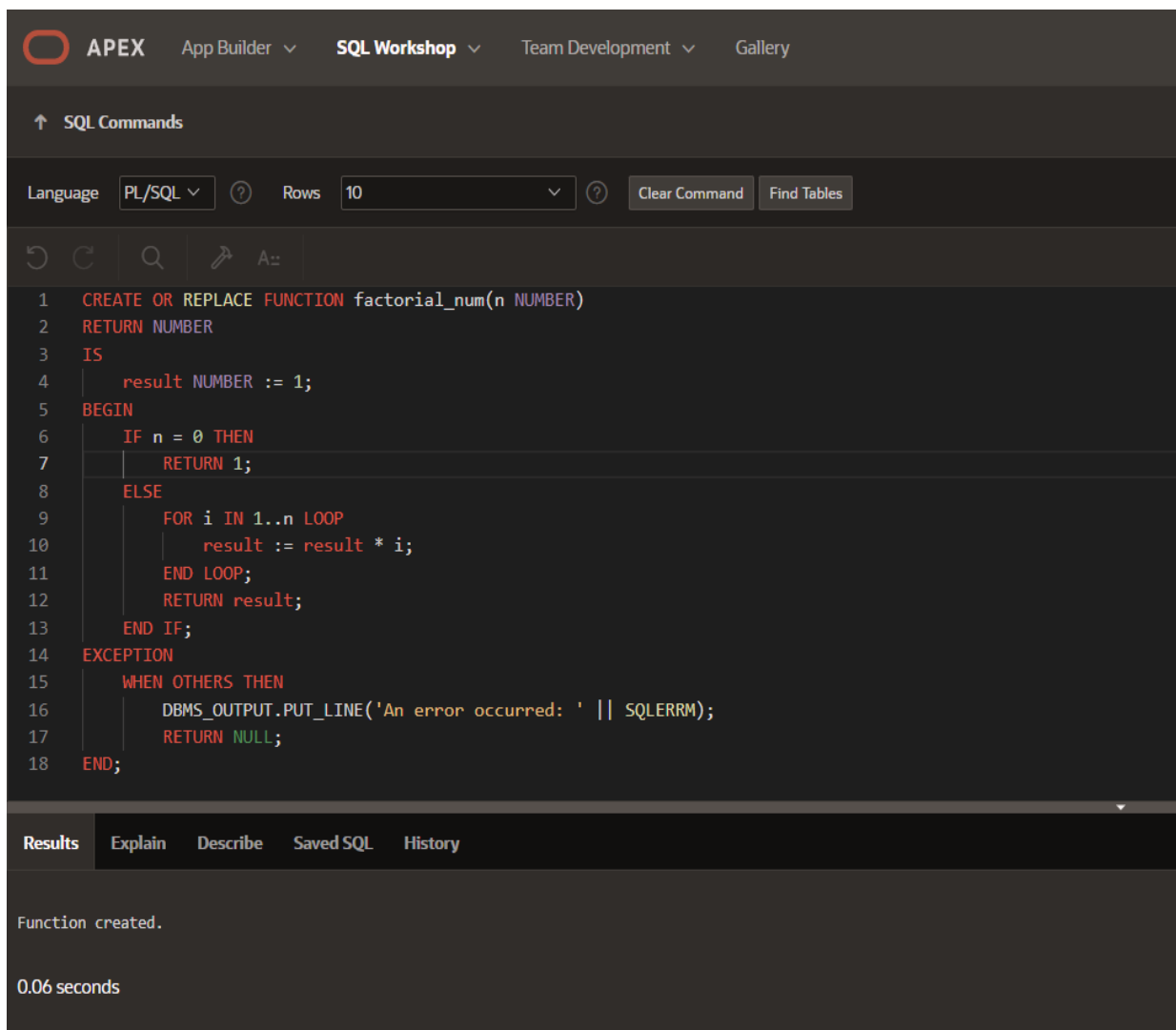
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### PROGRAM 1

### FACTORIAL OF A NUMBER USING FUNCTION



The screenshot displays the APEX SQL Workshop interface. At the top, the navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. Below this, the 'SQL Commands' section shows the 'Language' set to 'PL/SQL' and 'Rows' set to '10'. The main editor area contains the following PL/SQL code:

```
1 CREATE OR REPLACE FUNCTION factorial_num(n NUMBER)
2 RETURN NUMBER
3 IS
4     result NUMBER := 1;
5 BEGIN
6     IF n = 0 THEN
7         RETURN 1;
8     ELSE
9         FOR i IN 1..n LOOP
10            result := result * i;
11        END LOOP;
12        RETURN result;
13    END IF;
14 EXCEPTION
15     WHEN OTHERS THEN
16         DBMS_OUTPUT.PUT_LINE('An error occurred: ' || SQLERRM);
17         RETURN NULL;
18 END;
```

Below the editor, the 'Results' tab is active, showing the message 'Function created.' and the execution time '0.06 seconds'.

The screenshot shows the APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. The 'SQL Commands' section is active, showing a PL/SQL script with line numbers 1 through 7. The script declares a variable 'num' as 5 and 'fact\_result' as a NUMBER. It then begins a block where 'fact\_result' is assigned the value of 'factorial\_num(num)', and a message is printed using 'DBMS\_OUTPUT.PUT\_LINE'. The script ends with 'END;'. Below the editor, the 'Results' tab is selected, displaying the output: 'Factorial of 5 is 120', 'Statement processed.', and '0.01 seconds'.

```
1 DECLARE
2   num NUMBER := 5;
3   fact_result NUMBER;
4 BEGIN
5   fact_result := factorial_num(num);
6   DBMS_OUTPUT.PUT_LINE('Factorial of ' || num || ' is ' || fact_result);
7 END;
```

Factorial of 5 is 120  
Statement processed.  
0.01 seconds

## PROGRAM 2

Write a PL/SQL program using Procedures IN, INOUT, OUT parameters to retrieve the corresponding book information in library

The screenshot shows the APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. The 'SQL Commands' section is active, showing a PL/SQL script with line numbers 1 through 22. The script creates or replaces a procedure named 'get\_book\_info' with parameters 'p\_book\_id' (IN NUMBER), 'p\_title' (OUT VARCHAR2), 'p\_author' (OUT VARCHAR2), and 'p\_copies' (IN OUT NUMBER). The procedure body includes a 'SELECT' statement to retrieve book details from a 'books' table, an 'IF' statement to decrement 'p\_copies' if it's greater than 0, and an 'EXCEPTION' block to handle 'NO\_DATA\_FOUND' by setting 'p\_title' and 'p\_author' to 'Not Found' and 'p\_copies' to 0. The script ends with 'END get\_book\_info;' and a slash. Below the editor, the 'Results' tab is selected, displaying the output: 'Procedure created.' and '0.05 seconds'.

```
1 CREATE OR REPLACE PROCEDURE get_book_info(
2   p_book_id IN NUMBER,
3   p_title OUT VARCHAR2,
4   p_author OUT VARCHAR2,
5   p_copies IN OUT NUMBER
6 )
7 IS
8 BEGIN
9   SELECT title, author, copies_available
10  INTO p_title, p_author, p_copies
11  FROM books
12  WHERE book_id = p_book_id;
13   IF p_copies > 0 THEN
14     p_copies := p_copies - 1;
15   END IF;
16 EXCEPTION
17   WHEN NO_DATA_FOUND THEN
18     p_title := 'Not Found';
19     p_author := 'Not Found';
20     p_copies := 0;
21 END get_book_info;
22 /
```

Procedure created.  
0.05 seconds



## ↑ SQL Commands

Language PL/SQL ▾

Rows

30



Clear Command

Find Tables



A::

```
1 DECLARE
2     v_book_id NUMBER := 101;
3     v_title   VARCHAR2(100);
4     v_author  VARCHAR2(50);
5     v_copies  NUMBER := 0;
6 BEGIN
7     get_book_info(v_book_id, v_title, v_author, v_copies);
8     DBMS_OUTPUT.PUT_LINE('Book ID   : ' || v_book_id);
9     DBMS_OUTPUT.PUT_LINE('Title    : ' || v_title);
10    DBMS_OUTPUT.PUT_LINE('Author   : ' || v_author);
11    DBMS_OUTPUT.PUT_LINE('Copies   : ' || v_copies);
12 END;
13 /
```

## Results

Explain

Describe

Saved SQL

History

```
Book ID   : 101
Title     : C Programming
Author    : Dennis Ritchie
Copies    : 4
```

Statement processed.

0.01 seconds