**Practical 07**

**Write and execute PL/SQL function to print /return binary equivalent of decimal number.**

**Introduction**

A PL/SQL function is a subprogram that computes and returns a value. It helps in reusability, modular programming, and efficient database operations.

**Key Concepts Used in This Program**

● Functions in PL/SQL: A function must have a return type and return a value.

● Loops in PL/SQL: We use loops to repeatedly divide the decimal number by 2 to obtain its binary equivalent.

● String Operations: We build the binary number as a string.

**PL/SQL Function to Convert Decimal to Binary**

**Steps to Convert Decimal to Binary in PL/SQL**

1. Take a decimal number as input.

2. Use a LOOP to repeatedly divide the number by 2.

3. Store the remainders (0 or 1) in reverse order.

4. Return the final binary string.

**PL/SQL Function Code**

CREATE OR REPLACE FUNCTION decimal\_to\_binary(n IN NUMBER) RETURN VARCHAR2 IS

binary\_result VARCHAR2(100) := ''; -- Variable to store the binary equivalent

num NUMBER := n; -- Copy of the input number remainder NUMBER; -- Stores remainder after division BEGIN

-- Check for zero case

IF num = 0 THEN

RETURN '0';

END IF;

-- Loop to convert decimal to binary

WHILE num > 0 LOOP

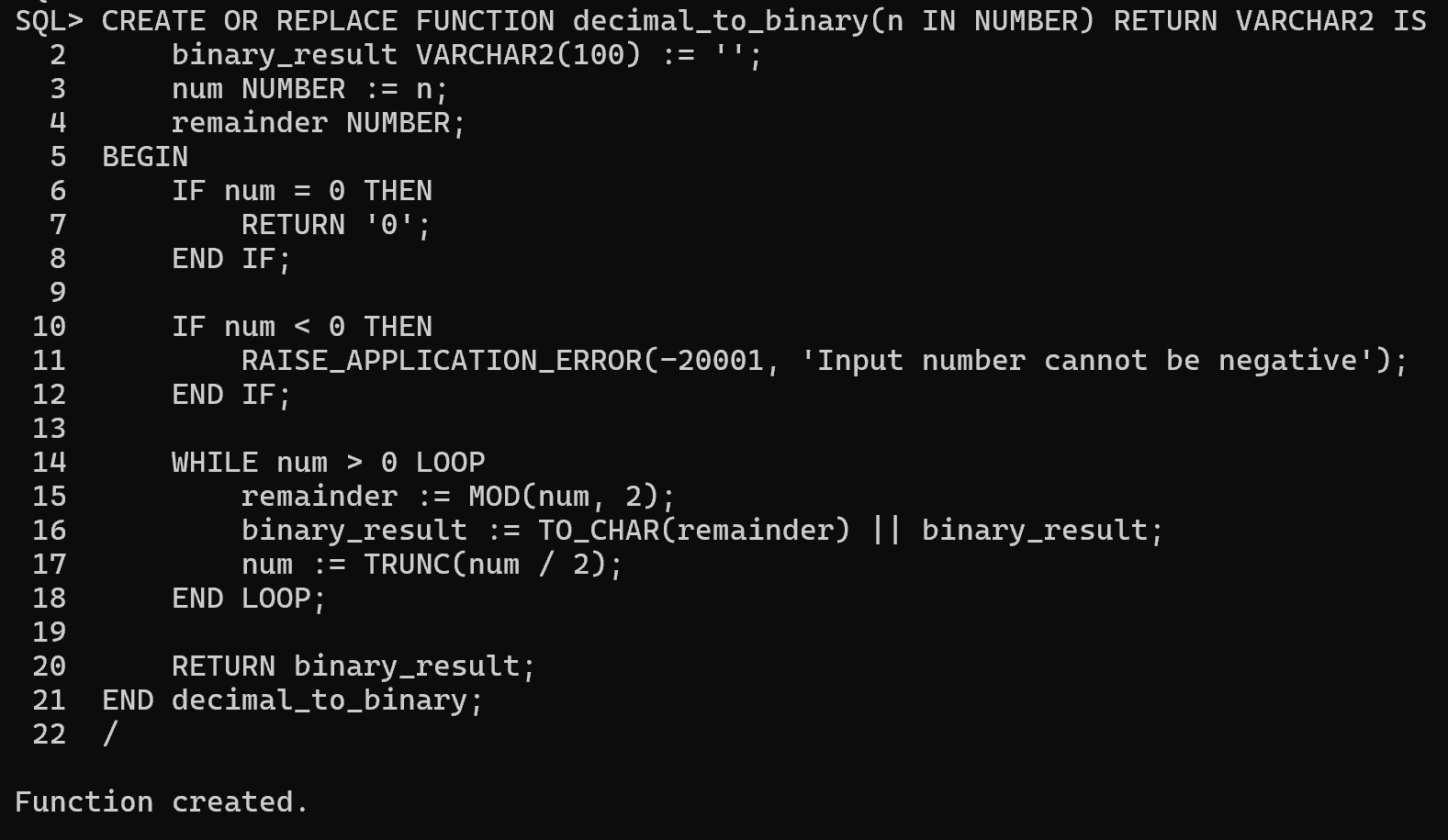
remainder := MOD(num, 2); -- Get remainder when divided by 2

binary\_result := remainder || binary\_result; -- Build binary string in reverse

num := TRUNC(num / 2); -- Reduce number by dividing by 2

END LOOP;

RETURN binary\_result; -- Return final binary value END decimal\_to\_binary;

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**How to Execute the Function**

**Call the Function Using PL/SQL Block**

DECLARE

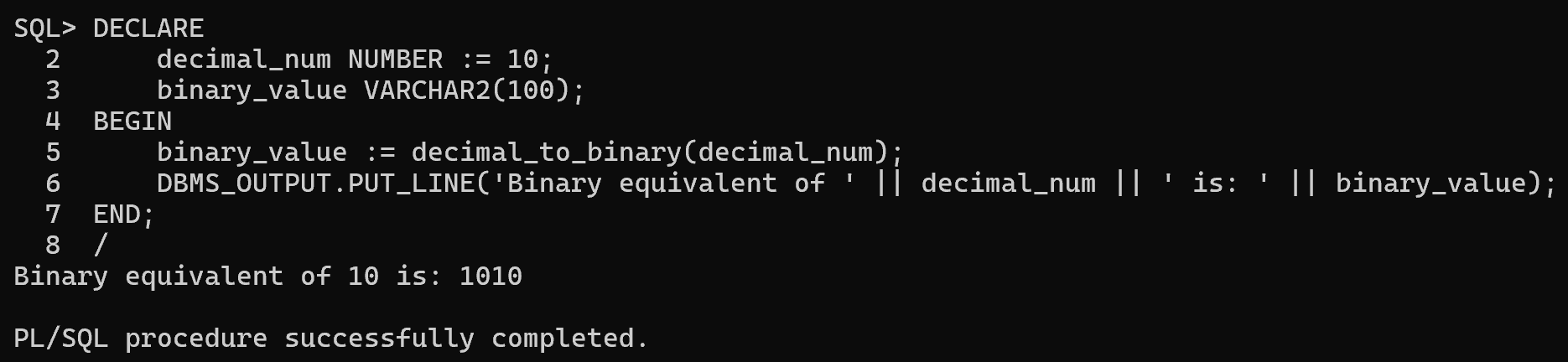
decimal\_num NUMBER := 10; -- Example decimal number binary\_value VARCHAR2(100);

BEGIN

binary\_value := decimal\_to\_binary(decimal\_num); DBMS\_OUTPUT.PUT\_LINE('Binary equivalent of ' || decimal\_num || ' is: ' || binary\_value);

END;

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**Expected Output: **

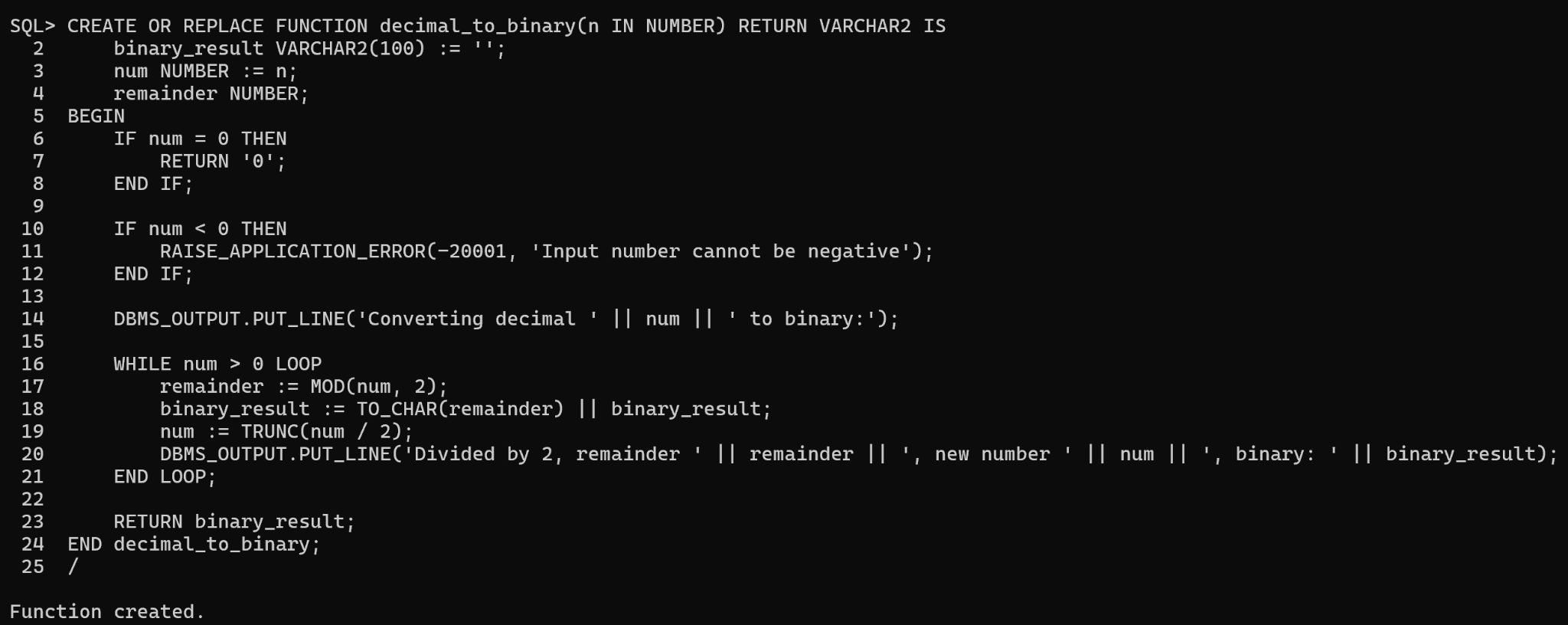
**Binary equivalent of 10 is: 1010**

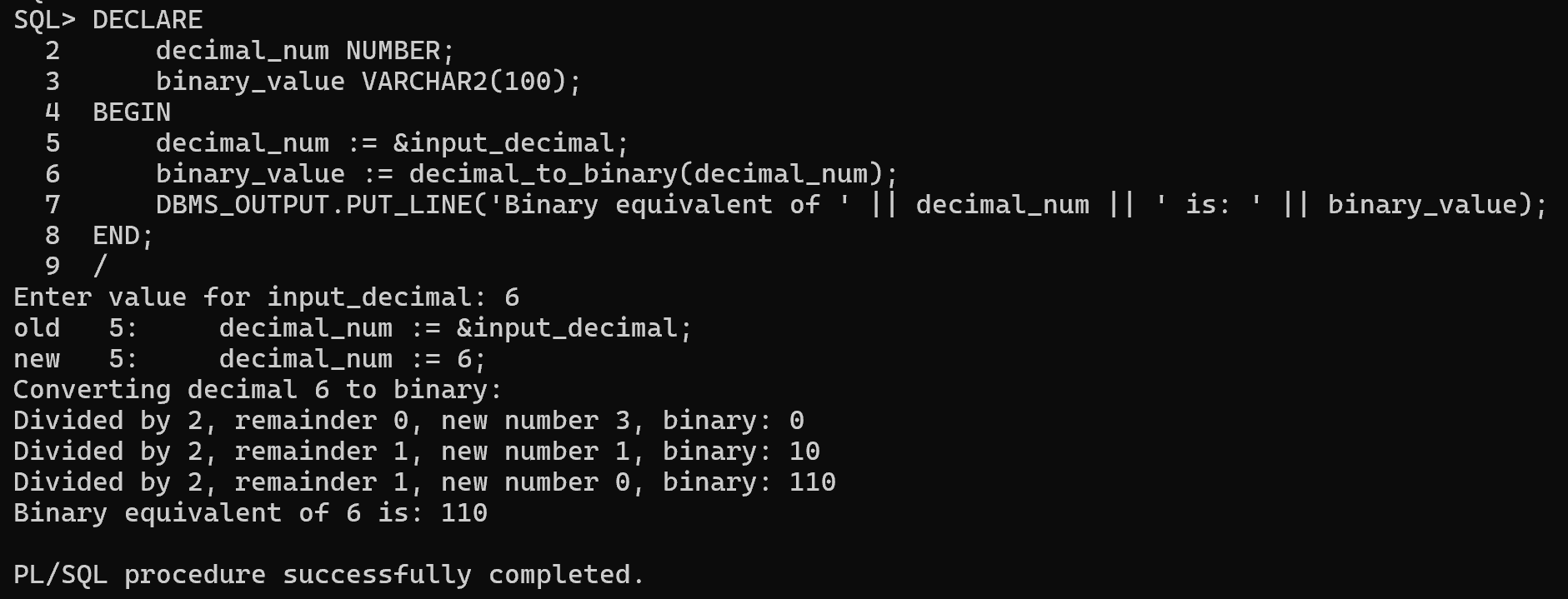
**Explanation of the Code**

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| **Step** | **Description** |
| Function Creation | Defines decimal\_to\_binary function with input n (decimal number). |
| Binary Result Variable | Stores the binary representation as a string. |
| Loop Execution | Repeatedly divides num by 2, storing remainders. |

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| String Concatenation | Builds binary number in reverse order. |
| Return Statement | Returns the final binary string. |

**Task**

1. Modify the function to display step-by-step conversion while calculating binary. 

2. Write a PL/SQL block to accept user input for the decimal number and call the function. 

3. Modify the function to store binary values in a table (binary\_conversions).