MySQL Functions

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What is a MySQL Function?

- A function is a stored program that returns a single value.
- Can be used in SELECT, WHERE, SET clauses.
- Similar to procedures but return values.
- Called inside SQL expressions.
- Q1: What is the main difference between a function and a procedure in MySQL?

Answer to Q1

- A: A function must return a value and can be used in expressions, unlike procedures.

Why Use Functions?

- Encapsulate reusable logic that returns a value.
- Used in queries, triggers, and views.
- Improves code modularity and readability.

- Q2: Can a function perform multiple SELECT queries like a procedure?

- Answer: No, it cannot.

- Why?
- - MySQL functions are designed to return a single value.
- - They are used within SQL expressions, so:
- • Must not produce multiple result sets.
- • Cannot include statements that modify data (like INSERT, UPDATE, DELETE).
- • Should be deterministic and side-effect free.

- Allowed in Functions:
- DECLARE total INT;
- SELECT COUNT(*) INTO total FROM employees;
- RETURN total;

- Not Allowed in Functions:
- SELECT * FROM employees; -- This will cause an error

- Use Cases:
- - Calculations (e.g., tax, discounts)
- - String manipulation
- - Date formatting
- - Input validations

Syntax of a Function

- DELIMITER $$
- CREATE FUNCTION name(params)
- RETURNS datatype
- BEGIN
- RETURN value;
- END $$
- DELIMITER ;

- Q3: Why is DETERMINISTIC used in function definitions?

Answer to Q3

- A: It tells MySQL the function always returns the same result for the same input.

Simple Function – Add Two Numbers

- DELIMITER $$
- CREATE FUNCTION AddNumbers(a INT, b INT)
- RETURNS INT DETERMINISTIC
- BEGIN
- RETURN a + b;
- END $$
- DELIMITER ;
- SELECT AddNumbers(10, 20);
- Q4: What will happen if we call AddNumbers(10, NULL)?

Answer to Q4

- A: It will return NULL, because any arithmetic with NULL gives NULL.

Function with String Manipulation

- DELIMITER $$
- CREATE FUNCTION Greet(name VARCHAR(50))
- RETURNS VARCHAR(100) DETERMINISTIC
- BEGIN
- RETURN CONCAT('Hello, ', name);
- END $$
- DELIMITER ;
- SELECT Greet('Amit');

- Q5: Can we use this function inside a WHERE clause?

Answer to Q5

- A: Yes. Functions can be used in WHERE, SELECT, and ORDER BY clauses.

Function to Calculate Square

```
DELIMITER $$
CREATE FUNCTION Square(x INT)
RETURNS INT DETERMINISTIC
BEGIN
   RETURN x * x;
END $$
DELIMITER ;
SELECT Square(7);
```

- Q6: Is it allowed to call a function from another function?

Answer to Q6

- A: Yes, as long as it doesn't cause recursion or infinite loops.

Function for Date Calculation

- DELIMITER $$
- CREATE FUNCTION YearsBetween(startDate DATE, endDate DATE)
- RETURNS INT DETERMINISTIC
- BEGIN
- RETURN YEAR(endDate) - YEAR(startDate);
- END $$
- DELIMITER ;
- SELECT YearsBetween('2010-01-01', '2024-01-01');

- Q7: Will this give accurate years if dates are not full years apart?

Answer to Q7

- A: No. Use TIMESTAMPDIFF for more accurate year difference calculation.

Viewing and Dropping Functions

- SHOW FUNCTION STATUS WHERE Db = 'your_db';
- SHOW CREATE FUNCTION function_name;
- DROP FUNCTION IF EXISTS function_name;

- Q8: Can we alter a function without dropping it first?

Answer to Q8

- A: No. You must DROP and re-CREATE the function.

Summary

- Functions return a single value.
- Cannot modify data (no INSERT/UPDATE).
- Useful in SELECT, WHERE, and expressions.
- Must always include RETURN statement.

Practice Challenges

- 1. Function to return area of circle (input radius).
- 2. Function to return reverse of a string.
- 3. Function to check if number is even or odd.
- 4. Function to return factorial of a number.