

Lecture Notes – String Functions

Section 1: Lecture Summary

SQL provides a rich set of **string functions** for tasks like finding string length, concatenating strings, changing case, extracting substrings, trimming spaces, padding strings, inserting or replacing substrings, and searching ASCII codes. These functions can be used in **SELECT**, **WHERE**, **GROUP BY**, **HAVING**, and **ORDER BY** clauses, and in **JOIN** conditions except plain **FROM** or natural joins.

Section 2: Key Concepts and Explanations

String functions enhance query writing by manipulating text data. Categories include length measurement (**length**), string combination (**concatenation**), case conversion (lowercase to uppercase), substring extraction, space removal (**trimming**), character addition (**padding**), substring modification (**inserting/replacing**), and ASCII searching. They apply across most SQL clauses for flexible filtering, grouping, sorting, and joining, enabling smarter queries. Practice is essential for effective use.

Section 3: Example Code and Use Cases

Using **eCommerceDB** to demonstrate string functions:

```
-- Concatenate customer full name and trim spaces
SELECT TRIM(CONCAT(FirstName, ' ', LastName)) AS FullName
FROM Customers
WHERE LENGTH(Email) > 10;
```

```
-- Uppercase city name, substring of ProductName, and pad with spaces
SELECT UPPER(City) AS CityUpper,
       SUBSTRING(ProductName, 1, 10) AS ShortName,
       LPAD(CategoryName, 15, ' ') AS PaddedCategory
FROM Customers c
JOIN Orders o ON c.CustomerID = o.CustomerID
JOIN OrderItems oi ON o.OrderID = oi.OrderID
JOIN Products p ON oi.ProductID = p.ProductID
JOIN Categories cat ON p.CategoryID = cat.CategoryID
ORDER BY FullName;
```

```
-- Replace substring in ProductName and find length
SELECT ProductID,
       REPLACE(ProductName, 'Wireless', 'Smart') AS ModifiedName,
       LENGTH(ProductName) AS NameLength,
       ASCII(SUBSTRING(ProductName, 1, 1)) AS FirstCharASCII
FROM Products
WHERE ProductName LIKE '%Phone%'
GROUP BY CategoryID
HAVING LENGTH(REPLACE(ProductName, ' ', '')) > 5;
```

Section 4: Key Takeaways

- Group related **string functions** (length, concat, case, substring, trim, pad, insert/replace, ASCII) for efficient learning.
- Use in **SELECT**, **WHERE**, **GROUP BY**, **HAVING**, **ORDER BY**, and **JOIN** conditions for versatile queries.
- Practice immediately to apply functions correctly in real scenarios.