Self-Study

1. ## NTILE(n)

   ### What is NTILE() ?

   The NTILE() function in SQL Server is a window function used to divide a result set into a specified number of roughly equal groups (or "tiles") and assigns a rank to each row based on its group. It's particularly useful for distributing data into percentiles, quartiles, or other equal-sized buckets.

   ### What does it do ?

   Divides the rows in each partition into n groups as evenly as possible.

   Assigns an integer value (from 1 to n) to each row, indicating its group (tile).

   If the number of rows is not perfectly divisible by n, earlier groups may have one more row than later groups.

   Syntax:

   ```
   NTILE(n) OVER (
   [PARTITION BY partition_expression, ... ]
   ORDER BY sort_expression [ASC | DESC], ...
   )
   ```

   Example:

   ```
   SELECT
   EmployeeID,
   SalesAmount,
   ```

```
  NTILE(4) OVER (ORDER BY SalesAmount DESC) AS SalesQuartile
  FROM Sales;
```

This divides the employees into 4 quartiles based on SalesAmount (highest to lowest).

If there are 20 rows, each quartile would ideally have 5 rows, but if the division isn't perfect, the first few tiles get the extra rows.

What differentiates it from the other types ?

NTILE(n): Divides rows into n equal groups, assigning a group number (1 to n). Ideal for bucketing (e.g., quartiles).
ROW_NUMBER(): Assigns a unique sequential number to each row, ignoring ties.
RANK(): Assigns ranks, giving ties the same rank and skipping subsequent numbers.
DENSE_RANK(): Like RANK(), but doesn't skip numbers after ties.

2. We Have 15 Instructors, and We Need to Get The 6th Instructors Who Take the lowest salary

```
SELECT [Ins_Id], [Salary]
FROM (
    SELECT [Ins_Id], [Salary],
           ROW_NUMBER() OVER (ORDER BY [Salary] ASC) AS RN
    FROM [dbo].[Instructor]
) AS RankedInstructors
```

```sql
WHERE RN = 6;
```