

CIS560

Window Functions



Window Functions

- For each row, computes a scalar value based on a calculation against a subset of the rows.
 - The subset of rows is known as the *window*.
- Accomplishes similar results as **grouped queries** (GROUP BY) except:
 - Preserves the detail (all rows).
 - Calculations can be done across varying groups (windows).
- Accomplishes similar results as **subqueries** except:
 - Uses the underlying query, preserving filters and rows as is.
 - Calculations can be done across varying groups (windows).
- Allows you to define order for the window in some cases.
 - Can be different than the presentation ordering (ORDER BY).



Window Functions

- Uses OVER clause, containing three parts:
 - Partitioning
 - Ordering
 - Framing
- Three categories
 - Ranking Window Functions
 - Analytic Window Functions (includes offset functions)
 - Aggregate Window Functions
- Syntax

```
OVER
(
  [ <PARTITION BY clause> ]
  [ <ORDER BY clause> ]
  [ <ROWS clause> ]
)
```



Ranking Functions

- Four functions
 - RANK
 - Assigns a true ranking, skipping numbers if ties occur.
 - DENSE_RANK
 - Assigns a ranking without skipping numbers resulting from ties.
 - ROW_NUMBER
 - Assigns an incrementing sequential number.
 - NTILE(N)
 - Assigns a tile number based on *N*.
- OVER Clause Usage
 - Partitioning is supported
 - Ordering is required
 - Framing is irrelevant



Offset Window Functions

- Four offset functions we'll look at:
 - LAG(value, [offset], [default])
Obtains a value from a row before the current row.
 - LEAD (value, [offset], [default])
Obtains a value from a row after the current row.
 - FIRST_VALUE(value)
Obtains the first value in the window frame.
 - LAST_VALUE(value)
Obtains the last value in the window frame.
- OVER Clause Usage
 - Partitioning is supported
 - Ordering is required
 - Framing is supported for FIRST_VALUE and LAST_VALUE



Aggregate Window Functions

- Typical aggregate functions are supported.
 - COUNT, SUM, MIN, MAX, AVG
 - DISTINCT is **not supported**
Although, simple work around for COUNT(DISTINCT <expr>)
- OVER Clause Usage
 - Partitioning is supported
 - Ordering is supported
 - Framing is supported
- Common uses with framing:
 - Running totals
 - Period running totals (MTD, YTD)
 - Moving averages

