Business School
UNIVERSITY OF COLORADO DENVER

Information Systems Program

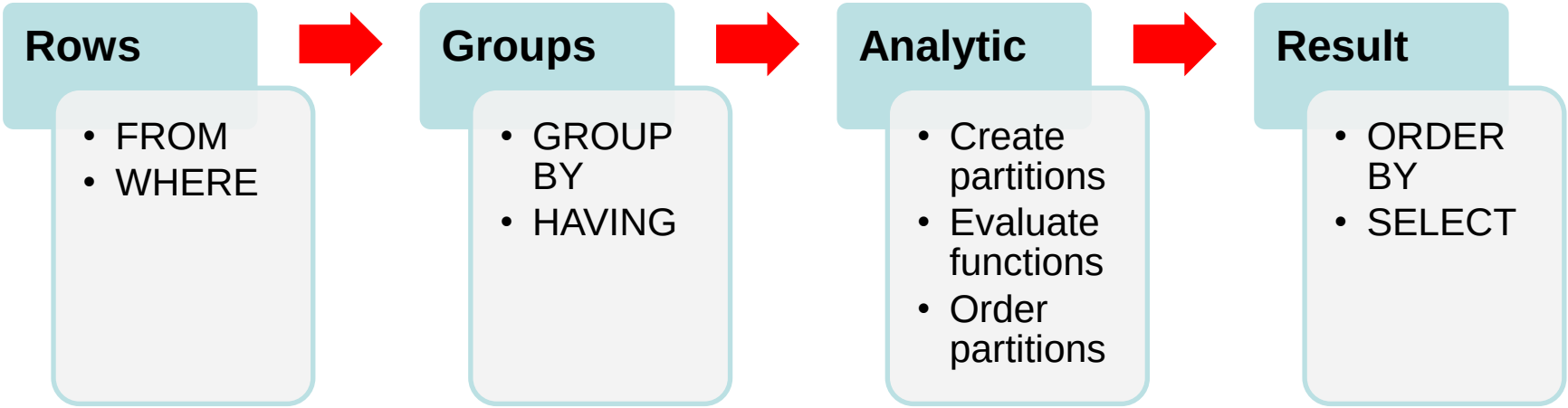
Module 3
SQL Analytic Functions

Lesson 2: Extended Syntax and Ranking Functions

Lesson Objectives

- Write statements using the PARTITIONED BY clause
- Understand conceptual differences among ranking functions
- Reflect about evaluation order of SELECT clauses

Analytic Function Processing



Extended Partitioning Syntax

- `<AnalyticFunction> ([<column-list>]) OVER ([PARTITION BY <partitioning>] [ORDER BY <ordering>] )`
  - PARTITION BY keywords
  - Divides result into partitions
  - Analytic function evaluated for each partition
- Example

```
RANK() OVER (
  PARTITION BY CustState
  ORDER BY SUM(SalesDollar) ) AS SalesRank
```


Ranking with Partitioning Example

- Rank customers by descending sum of dollar sales
- Partition ranking on customer state

```
SELECT CustState, CustName, SUM(SalesDollar) AS SumSales,
  RANK() OVER (PARTITION BY CustState
               ORDER BY SUM(SalesDollar) DESC) SalesRank
 FROM SSSales, SSCustomer
 WHERE SSSales.CustId = SSCustomer.CustI
 GROUP BY CustState, CustName
 ORDER BY CustState;
```


Ranking Functions

RANK
- Ranking gaps

DENSE_RANK
- No ranking gaps

NTILE
- Equal division
- Specify divisions

ROW_NUMBER
- Total ordering
- No gaps

Golf Leaderboard		
Score	RANK()	DENSE_RANK()
-10	1	1
-9	2	2
-9	2	2
-8	4	3

Combined Ranking Example

- Compare ranking functions
- Rank customers by descending sum of unit sales
- Evaluate functions on entire results (no partitioning)

```
SELECT CustZip, SUM(SalesUnits) AS SumSalesUnits,
  RANK() OVER (ORDER BY SUM(SalesUnits) DESC) SURank,
  DENSE_RANK() OVER (ORDER BY SUM(SalesUnits) DESC) SUDenseRank,
  NTILE(4) OVER (ORDER BY SUM(SalesUnits) DESC) SUNTile,
  ROW_NUMBER() OVER (ORDER BY SUM(SalesUnits) DESC) SURowNum
 FROM SSSales, SSCustomer
 WHERE SSSales.CUSTID = SSCustomer.CUSTID
 GROUP BY CustZip;
```


Additional Problems

- Example 3
  - Dense rank item brands descending by the number of sales rows
  - Partition ranking by year
  - Only include brands with more than 5 sales in a year
  - Show item brand, year, count, and dense rank in the result
- Example 4
  - Rank (both) item brands by descending sum of dollar sales in 2020
  - Partition rankings by month
  - Show item brand, month, sum of sales, and ranks (both)
- Solutions in a module 3 document

Summary

- Analytic functions evaluated over partitions
- Ranking functions for qualitative evaluation